

2019

Yearbook
Jaarboek



**FACULTY OF NATURAL AND
AGRICULTURAL SCIENCES**
UNDERGRADUATE

**FAKULTEIT NATUUR-EN
LANDBOUWETENSKAPPE**
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PLEASE MENTION YOUR UNIVERSITY NUMBER IN ALL CORRESPONDENCE.

The General Academic Rules of the University, to which all students have to subject themselves and which apply to all the qualifications offered by the University, appear in a separate publication and are available on the web page at: <http://www.nwu.ac.za/yearbooks>.

Please note: Although the information in this Calendar has been compiled with the utmost care and accuracy, the Council and the Senate of the University accept no responsibility whatsoever for errors that may occur. Before students finally decide on the selection of modules, they must consult the class timetable. If a clash occurs in the planned selection of a student, the relevant module combination is not permitted.

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U UNIVERSITEITSNOMMER MOET ASSEBLIEF IN ALLE KORRESPONDENSIE VERMELD WORD.

Die Algemene Akademiese Reëls van die Universiteit, waaraan alle studente hulle moet onderwerp en wat op al die kwalifikasies wat die Universiteit aanbied, van toepassing is, verskyn in 'n afsonderlike bundel op die web by: <http://www.nwu.ac.za/yearbooks>.

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Kgosi Leruo Molotlegi

VICE-CHANCELLOR / VISE-KANSELIER

Prof ND Kgwadi

DEPUTY VICE-CHANCELLOR: RESEARCH AND INNOVATION / ADJUNK VISE-KANSELIER: NAVORSING EN INNOVASIE

Prof MN Phaswana-Mafuya

DEPUTY VICE-CHANCELLOR: TEACHING AND LEARNING / ADJUNK VISE-KANSELIER: ONDERRIG EN LEER

Prof RJ Balfour

DEPUTY VICE -CHANCELLOR: ASSIGNED FUNCTIONS AND POTCHEFSTROOM CAMPUS OPERATIONS / VISE-KANSELIER: TOEWYSBARE FUNKSIES EN POTCHEFSTROOMKAMPUSBEDRYF

Prof DM Balia

DEPUTY VICE-CHANCELLOR: ASSIGNED FUNCTIONS AND MAFIKENG CAMPUS OPERATIONS / VISE-KANSELIER: TOEWYSBARE FUNKSIES EN MAFIKENGKAMPUSBEDRYF

Prof M Setlalentoa

DEPUTY VICE-CHANCELLOR: PLANNING AND VAAL TRIANGLE CAMPUS OPERATIONS / ADJUNK VISE-KANSELIER: TOEWYSBARE FUNKSIES EN VAALDRIEHOEKKAMPUSBEDRYF

Prof L du Plessis

EXECUTIVE DIRECTOR STUDENT LIFE / UITVOERENDE DIREKTEUR: STUDENTELEWE

Vacant / *Vakant*

EXECUTIVE DIRECTOR CORPORATE RELATIONS AND MARKETING / UITVOERENDE DIREKTEUR KORPORATIEWE VERHOUDINGE EN BEMARKING

Mr C Manoko

EXECUTIVE DIRECTOR FINANCE AND FACILITIES / UITVOERENDE DIREKTEUR FINANSIES EN FASILITEITE

Ms E de Beer

EXECUTIVE DIRECTOR PEOPLE AND CULTURE / UITVOERENDE DIREKTEUR MENSEKULTUUR

Dr M Singh

REGISTRAR / REGISTRATEUR

Prof MM Verhoef

NWU EXECUTIVE DEANS / NWU UITVOERENDE DEKANE

Faculty of Economics and Management Sciences / *Fakulteit Ekonomiese en Bestuurswetenskappe*

Prof S Swanepoel

Faculty of Education / *Fakulteit Opvoedkunde*

Prof L Conley

Faculty of Engineering / *Fakulteit Ingenieurswese*

Prof LI van Dyk

Faculty of Health Sciences / *Fakulteit Gesondheidswetenskappe*

Prof AF Kotzé

Faculty of Humanities / *Fakulteit Geesteswetenskappe*

Prof P Maseko (Exec Dean)

Faculty of Law / *Fakulteit Regte*

Prof SPLR de la Harpe

Faculty of Natural and Agricultural Sciences / *Fakulteit Natuur- en Landbouwetenskappe*

Prof EE Ebenso

Faculty of Theology / *Fakulteit Teologie*

Vacant / *Vakant*

**FACULTY OF NATURAL AND AGRICULTURAL SCIENCES (FNAS) OFFICE
BEARERS / FAKULTEIT NATUUR- EN LANDBOUWETENSKAPPE (FNLW)
AMPSDRAERS**

EXECUTIVE DEAN / UITVOERENDE DEKAAN

Prof EE Ebenso, BSc (Hons)(Calabar), MSc (Ibadan), PhD (Calabar)

DEPUTY DEANS / ADJUNK DEKANE

Teaching and Learning / Onderrig en Leer

Prof HP Drummond, Hons BSc (UCT) HED (PG) MEd (Wits), PhD (NWU)

Research and Innovation / Navorsing en Innovasie

Prof DM Modise: BSc Hort. With Honours (University of Bath, UK); MSc Hort. (West Virginia University, USA) and PhD BioSciences (University of Nottingham, UK).

Community Engagement and Stakeholder Relations/ Gemeenskapsbetrokkenheid en Belanghebbende Verhouding

Prof TR Medupe, BSc (UCT); Hons (UCT); MSc (Astronomy, UCT); PhD (Astronomy, UCT).

SCHOOLS / SKOLE

SCHOOL DIRECTORS / SKOOLDIREKTEURE

School of Agricultural Sciences / Skool vir Landbouwetenskappe

Mafikeng: Acting Director/ *Waarnemende Direkteur*: Dr LE Motsei BSc Agric (UNW), MSc Agric, PhD Agric (NWU)

School of Biological Sciences / Skool vir Biologiese Wetenskappe

Potchefstroom: Prof V Wepener, BSc, Hons BSc, HED, MSc, PhD (RAU)

Mafikeng: Deputy Director/*Adjunk Direkteur*: Prof Thami Sithebe, MSc(University of Illinois), PhD Virology (Medunsa)

School of Mathematical and Statistical Sciences / Skool vir Wiskundige en Statistiese Wetenskappe

Potchefstroom: Prof GJ Groenewald, Hons BSc (UWC), MSc (Univ of Illinois at Urbana-Champaign) MSc (UK), PhD (Vrije Univ at Amsterdam)

Vaal Triangle: Acting Deputy Director/*Waarnemende Adjunk Direkteur*: Miss D Gerber, Hons BSc Mathematics (NWU), MSc Mathematics (NWU)

School of Computer Science and Information Systems / Skool vir Rekenaarwetenskap en Inligtingstelsels

Potchefstroom: Acting Director/ *Waarnemende Direkteur*: Prof E Taylor, PhD (NWU), HED(N) (PU for CHE)

Vaal Triangle: Acting Deputy Director/*Waarnemende Adjunk Direkteur*: Dr C Venter, PhD (NWU)

School of Geo- and Spatial Sciences / Skool vir Geo- en Ruimtelike Wetenskappe

Potchefstroom: Prof SJ Piketh, BA (WITS); BA Hons (WITS); MSc (WITS); PhD (University of the Witwatersrand, Johannesburg)

Mafikeng: Deputy Director/*Adjunk Direkteur*: Prof LG Palamuleni, BEd (Geography) University of Malawi, MSc Environmental Sciences (University of Malawi), PhD Geography (University of Johannesburg)

School of Physical and Chemical Sciences / Skool vir Fisiese en Chemiese Wetenskappe

Mafikeng: Acting Director: Prof L Katata-Seru, BSc, BSc Hons (UWC) MSc (Stellenbosch), PhD (Stellenbosch)

Potchefstroom: Acting Deputy Director/ *Waarnemende Adjunk Direkteur*: Prof FH van der Westhuizen, PhD (NWU)

RESEARCH ENTITIES / NAVORSINGSENTITEITE / CENTRE / SENTRUMS

RESEARCH DIRECTORS / NAVORSINGSDIREKTEURE / CENTRE DIRECTORS / SENTRUMDIREKTEURE

Focus Area for Chemical Resource Beneficiation / Fokusarea vir Chemiese Hulpbronveredeling

Potchefstroom: Prof HCM Vosloo, Hons BSc (UOVS), PhD (PU for CHE), HED (UOVS)

Focus Area: Human Metabolomics / Fokusarea vir Menslike Metabolomika

Potchefstroom: Prof DT Loots, BSc (NWU - Biochemistry and Microbiology), BSc Hons (NWU - Biochemistry), MSc (NWU - Biochemistry), PhD (NWU - Biochemistry)

Focus Area for Material Science Innovation and Modelling / Fokusarea vir Materiaalwetenskap Innovasie en Modelling

Mafikeng: Acting Director/*Waarnemende Direkteur*: Prof EE Ebenso BSc (Hons)(Calabar), MSc (Ibadan), PhD (Calabar)

Niche area for Food Safety and Security / Nisarea vir Voedselveiligheid en Sekuriteit

Mafikeng: Prof OO Babalola, BSc Hons (Ogun), MSc, PhD (Univ of Ibadan), PGD Middle Management (NWU)

School of Research and Postgraduate Studies/ Skool vir Navorsing en Nagraadse Studie

Mafikeng: Prof DA Isabirye – BSc Hons (Makerere), PhD (Hong Kong)

Unit for Business Mathematics and Informatics / Eenheid vir Bedryfswiskunde en Informatika

Potchefstroom: Prof HM Huisman, BSc (PU for CHE), Hons BSc (PU for CHE), MSc (PU for CHE), PhD (PU for CHE)

Unit for Environmental Sciences and Management / Eenheid vir Omgewingswetenskappe en -bestuur

Potchefstroom: Prof N Smit, PhD (UOFS)

- **Africa Centre for Disaster Studies / Afrika Sentrum vir Rampstudies**

Potchefstroom: **Head/Hoof**: Prof D van Niekerk, BA(RAU), Hons BA (RAU), MPM (UNISA), PhD (NWU).

Centre for Applied Radiation Science and Technology / Sentrum vir Toegepaste Stralingswetenskap en –tegnologie

Mafikeng: Prof V Tshivhase, BSc Hons Physics (UCT), MSc Physics (UCT), MBA (NWU), PhD Physics (UCT)

Centre for Business Mathematics and Informatics / Sentrum vir Bedryfswiskunde en Informatika

Potchefstroom: Prof PJ de Jongh, BCom (US), MSc (UNISA), PhD (UCT)

Centre for Environmental Management / Sentrum vir Omgewingsbestuur

Potchefstroom: Prof JG Nel, BA (Ed), Hons BA (UPE), MA (UPE)

Centre for Human Metabolomics / Sentrum vir Menslike Metabolomika

Potchefstroom: Prof BC Vorster, MMed (Chem Paths), (UP)

Centre for Indigenous Knowledge Systems / Sentrum vir Inheemse Kennissisteme

Mafikeng: Prof SA Materechera, BSc Agric (Malawi), MSc Soil Sci (McGill, Canada), PhD (Adelaide, South Australia)

Centre for Space Research (Centre of Excellence) / Sentrum vir Ruimtenavorsing (Sentrum van Uitnemendheid)

Potchefstroom: Prof SES Ferreira, PhD (PU for CHE)

Centre for Water Science and Management / Sentrum vir Waterwetenskappe en -bestuur

Potchefstroom: Prof I Dennis, PhD (UFS)

ACADEMIC SUPPORT SERVICES / AKADEMIESE ONDERSTEUNINGSDIENSTE

Instrument making / Instrumentmakery

Potchefstroom: **Head/Hoof:** Mr / Mnr PB Erasmus (*Nas Dipl vir Tegnici*)

SUBJECT GROUP CHAIRPERSONS/ VAKGROEPVOORSITTERS

Agricultural Economics and Extension / Landbou Ekonomie en Voorligting

Mafikeng: Prof SS Letsoalo, BSc (Agric.Education) UN, B Inst Agric.Extension (Hons) UP, M Agric. Extension UL, M Education TUT, MBA Regenesys, PhD (Agricultural Extension) NWU

Agronomy and Horticulture / Agronomie en Tuinbou

Mafikeng: Dr ET Sebetha, B.Sc Hons (Botany) UNIM, M.Sc. Agric (Horticulture) UL, PhD (Crop Science, Agronomy) UKZN

Animal Health / Dieregesondheid

Mafikeng: Prof M Mwanza,DVM (University of Lubumbashi) MSc ,(UJ) PhD (UJ)

Animal Science / Dierewetenskap

Mafikeng: Prof HK Mokoboki BSc. Agric, BSc. Agric (Hons), (University of the North), MSc Agric, PhD Agric (UL)

Biochemistry / Biochemie

Potchefstroom: Prof R Louw, PhD Biochemistry (NWU)

Mafikeng: Prof E Mukwevho, BSc (Univen), BSc Hons (UL), MSc (UCT), PhD (UCT), Cert in Financial Management (UCT), Cert in Project Management (UCT).

Botany / Plantkunde

Potchefstroom: Prof SJ Siebert, PhD (UP)

Centre for Business Mathematics and Informatics: Professional Programmes / Sentrum vir Bedryfswiskunde en Informatika: Professionele Programme

Potchefstroom:

Ms J Larney, BSc, MCom, FASSA, FIA, CERA

- Actuarial Science / *Aktuariële Wetenskap*
- Quantitative Risk Management / *Kwantitatiewe Risikobestuur*
- Financial Mathematics / *Finansiële Wiskunde*
- Business Analytics / *Bedryfsanalise*

Vaal Triangle: Miss D Gerber, Hons BSc Mathematics (NWU), MSc Mathematics (NWU) (responsible for BMI programmes/*verantwoordelik vir BWI-programme*)

MSc in Business Mathematics and Informatics with specialisation in above fields / MSc in Bedryfswiskunde en Informatika met spesialisering in bogenoemde velde

Prof H Raubenheimer, BSc, MSc, PhD (NWU)

Chemistry / Chemie

Potchefstroom: Dr J Röscher, PhD (NWU), HED (PU for CHE)

Mafikeng: Dr Zimbili Mkhize: PhD (UKZN)

Computer Science and Information Systems / Rekenaarwetenskap en Inligtingstelsels

Potchefstroom: Prof Lynette Drevin, BSc (PU for CHE), HED (PU for CHE), Hons BSc (PU for CHE), MSc (PU for CHE), DTE (PU for CHE), PhD (Middlesex University, London, UK)

Mafikeng: Prof N Gasela, MSc(USSR) MSc (Abertay,Dundee) PhD (NUST, Zimbabwe)

Vaal Triangle: Ms JT Janse van Rensburg, MSc (NWU)

Geography and Environmental Management / Geografie en Omgewingsbestuur

Potchefstroom: Dr DP Cilliers, PhD (NWU)

Mafikeng: Dr M Manjoro BSc.Ed (ISP,EJV, Cuba), BSc. Hons-GIS/RS (UFH), MSc. (UNAH, Cuba), PhD (NMMU)

Geology / Geologie

Potchefstroom: Dr DM van Tonder MSc (UP), PhD (TUT)

Mathematics and Applied Mathematics / Wiskunde en Toegepaste Wiskunde

Potchefstroom: Prof DG Kubayi, PhD (Wits)

Mafikeng: Prof SC Oukouomi Noutchie, MSc (UNISA), PhD (UKZN)

Vaal Triangle: Dr I Takaidza, BSc Hons (University of Zimbabwe), MSc (University of Zimbabwe), DTech (CPUT)

Microbiology / Mikrobiologie

Potchefstroom: Prof S Claassens, PhD (NWU)

Mafikeng: Prof C. Ateba

Physics/ Fisika

Potchefstroom: Prof SI Loubser, BSc (NWU), MSc (NWU), PhD (UCLan, UK)

Mafikeng: Dr DC Ndiitwani BSc Hons (PU for CHE), MSc (NWU), PhD (UKZN)

Statistics and Operational Research / Statistiek en Operasionele Navorsing

Potchefstroom: Prof L Santana, PhD (NWU)

Vaal Triangle: Mr RP Ntema, MSc (NWU)

Urban and Regional Planning / Stads- en Streekbeplanning

Potchefstroom: Prof EJ Cilliers, Pr Pln, PhD (NWU)

Zoology / Dierkunde

Prof MS Maboeta, PhD (Stellenbosch University)

Senior Faculty Administrator / Senior Fakulteit Administrateur:

Heleen Swart.

FACULTY BOARD / FAKULTEITSRAAD

The Faculty Board is comprised of the following members / *Die Fakulteitsraad word verteenwoordig deur die volgende lede:*

- The Executive Dean / *Uitvoerende Dekaan* (chairperson of the Faculty Board/ *voorsitter van die Fakulteitsraad*) (per appointment contract / per kontraksaanstelling)
- Deputy Deans / *Adjunk Dekane* (per appointment contract)
- Directors (School/Centre and Research Entity Directors) / *Direkteure (Skool-/Sentrum- en Navorsings- Entiteidirekteure* (per appointment contract / *per kontraksaanstelling*)
- Academic employees elected by the academic employees with due account to the geographic representation of the Faculty, the positions within the faculty as well as representation in terms of race, gender and disability. (Three-year term) / *Akademiese werknemers verkies deur die akademiese werknemers, met inagneming van die geografiese verteenwoordiging van die Fakulteit, die posisies binne die fakulteit, sowel as verteenwoordiging in terme van ras, geslag en gestremdheid. (Drie-jaar termyn)*
- Senior Faculty Administrator / *Senior Fakulteit Administrateur* (per appointment contract / *per kontraksaanstelling*)
- Student representation by means of a representative of formally constituted substructures of the Student Representative Council (SRC) and designated annually by the SRC/. (one-year term)
Studenteverteenwoordiging, deur middel van 'n verteenwoordiger van die formeel saamgestelde sub-strukture van die Verteenwoordigende Studenteraad (VSR) soos jaarliks deur die VSR aangewys word. (eenjaar termyn)

The Faculty Management Committee is a standing subcommittee of the Faculty Board and serves as Executive Committee of the Faculty Board. It handles Faculty matters between meetings of the Faculty Board and reports all activities to the next meeting of the Faculty Board. / *Die Fakulteit Bestuurskomitee is 'n staande subkomitee van die Fakulteitsraad en dien as die Uitvoerende Komitee van die Fakulteitraad. Dit hanteer Fakulteitsaangeleenthede tussen die vergaderings van die Fakulteitsraad en rapporteer alle aktiwiteite aan die volgende Fakulteitsraadvergadering.*

MEMBERSHIP / LIDMAATSKAP

The membership of the Faculty Management Committee is as follows / *Die lidmaatskap van die Fakulteit Bestuurskomitee is as volg:*

- The Executive Dean (Chair) / *Die Uitvoerende Dekaan (Voorsitter).*
- The Deputy Dean for Teaching and Learning / *Die Adjunk Dekaan vir Onderrig en Leer.*
- The Deputy Dean for Research and Innovation / *Die Adjunk Dekaan vir Navorsing en Innovasie.*
- The Deputy Dean for Community Engagement and Stakeholder Relations/ *Die Adjunk Dekaan vir Gemeenskapsbetrokkenheid en Belanghebbende Verhoudinge.*
- The directors of schools and research entities and directors of centres as determined by the Dean / *Die direkteure van skole en navorsingsentiteite en direkteure van sentrums soos deur die dekaan bepaal.*
- The Faculty Administrator (s) / *Die Fakulteit Administrateur (s).*
- The Quality Coordinator / *Die Kwaliteitskoördineerder.*
- Representatives of the Academic Student Societies / *Verteenwoordigers van die Akademiese Studente Vereenigings.*
- Secretariat services are provided by Corporate Information and Governance Services / *Sekretariaatdienste soos voorsien deur die Korporatiewe en Inligtingsbestuursdienste.*

The Executive Dean and the deputy deans determine the final composition of the Faculty Management Committee / *Die Uitvoerende Dekaan en die adjunk dekaane bepaal die finale samestelling van die Fakulteit Bestuurskomitee.*

FACULTY OF NATURAL AND AGRICULTURAL SCIENCES



FAKULTEIT NATUUR- EN LANDBOUWETENSKAPPE

Uitvoerende Dekaan

Adjunkdekaan
Navorsing & Innovasie

Adjunkdekaan
Onderrigleer

Adjunkdekaan
Gemeenskapsbetrokkenheid en
Belangegroepverhoudings

SKOLE

Skool vir Biologiese
Wetenskappe
Dierkunde-Mikrobiologie-Plantkunde

Skool vir Fisiese en Chemiese
Wetenskappe
Biochemie - Chemie - Fisika

Skool vir Geo- en Ruimtelike
Wetenskappe
Geografie - Geologie -
Stads- en Streekbeplanning

Skool vir
Landbouwetenskappe
Dieregesondheidstudies -
Dierewetenskappe-Gewaswetenskappe
- Landbou-ekonomie en Voorligting

Skool vir Rekenaarwetenskap
en Inligtingstelsels
RekenaarwetenskappeInligtingstelsels

Skool vir Wiskundige en
Statistiese Wetenskappe
Wiskunde en Toegepaste Wiskunde -
Statistiek

NAVORSINGS- ENTITEITE

Eenheid vir Bedryfswiskunde
en Informatika

Fokusarea vir
Menslike Metabolomika

Eenheid vir
Omgewingswetenskappe en
-bestuur
Afrika-sentrum vir Rampstudies

Fokusarea vir
Materiaalwetenskap
Innovasie en Modellering

Sentrum vir Ruimtenavorsing

Nisarea vir Voedselveiligheid
en -sekuriteit

Fokusarea vir
Chemiese Hulpbronveredeling

SENTRUMS

Sentrum vir Bedryfswiskunde
en Informatika

Sentrum vir
Inheemse Kennissisteme

Sentrum vir
Menslike Metabolomika

Sentrum vir
Omgewingsbestuur
(CEM)

Sentrum vir Toegepaste
Stralingswetenskap en
-tegnologie

Sentrum vir
Waterwetenskappe en
-bestuur

AKADEMIESE ONDERSTEUNINGSDIENSTE

Instrumentmakery

NAS.1 FACULTY RULES / FAKULTEITSREËLS

NAS.1.1 AUTHORITY OF THE GENERAL ACADEMIC RULES (A-RULES) / GESAG VAN DIE ALGEMENE AKADEMIESE REËLS (A-REËLS)

The faculty rules valid for the different qualifications, programmes and curricula of this faculty and contained in this faculty calendar are subject to the General Rules of the University, as determined from time to time by the Council of the University on recommendation by the Senate. The faculty rules should therefore be read in conjunction with the General Academic Rules.

The General Academic Rules (A-Rules) are available on the University's web page at: http://www.nwu.ac.za/content/policy_rules

Die Fakulteitsreëls, wat ten aansien van die verskillende kwalifikasies, programme en kurrikulums van hierdie Fakulteit geld en in hierdie Fakulteitsjaarboek opgeneem is, is onderhewig aan die Algemene Akademiese Reëls van die Universiteit, soos dit van tyd tot tyd deur die Raad van die Universiteit op aanbeveling van die Senaat vasgestel word, en moet dus met daardie Algemene Reëls saamgelees word.

Die Algemene Akademiese Reëls (A-Reëls) verskyn op die Universiteit se Tuisblad by: http://www.nwu.ac.za/content/policy_rules

NAS.1.1.1 Recognition of prior learning (A-Rule 1.6 & 1.7) / Erkenning van vorige leer (A-Reël 1.6 & 1.7)

The North-West University accepts the principle underlying outcomes-based, source-based and lifelong learning, in which considerations of articulation and mobility play a significant role, and subscribes to the view that recognition of prior learning, whether acquired by formal education programmes at this or another institution, or informally (from experience), is an indispensable element in deciding on admission to and awarding credits with a view to placement in an explicitly selected teaching-learning programme of the University. /

Die Noordwes-Universiteit aanvaar die beginsel onderliggend aan uitkomsgerigte, brongebaseerde en lewenslange leer, waarin artikulasie en mobiliteit 'n betekenisvolle rol speel, en onderskryf die siening dat erkenning van vorige leer, hetsy dit in formele onderrigprogramme by hierdie of 'n ander instelling, of informeel (deur ervaring) opgedoen is, 'n onontbeerlike element by die besluit oor toelating tot en kredietverlening met die oog op plasing binne 'n uitdruklik gekose onderrigleerprogramme van die Universiteit uitmaak.

Recognition of prior learning concerns the provable knowledge and learning that an applicant has acquired, whether by having completed formal education programmes, or from experience. At all times the question will be what the level of the skills is, and skills will be assessed in the context of the exit level skills required by the intended teaching-learning programme or modules in the programme, or the status for which the applicant applies, and not merely by virtue of the experience recorded by the applicant. Recognition of prior learning will therefore take place in terms of applied competencies demonstrated by the applicant in his/her application, taking into consideration the exit level outcomes that have to be obtained by means of the selected teaching-learning programme. /

By die erkenning van vorige leer handel dit oor die bewysbare kennis en leer wat 'n aansoeker opgedoen het, hetsy deur formele onderrigprogramme, of deur ervaring. Ten alle tye sal die vraag wees watter vlak van vaardigheid,

beoordeel in die konteks van die uitreevlakvaardighede wat vereis word vir die beoogde onderrigleerprogram of modules daarbinne, of status waarvoor die aansoeker aansoek doen, en nie bloot om die ervaring wat 'n aansoeker kan boekstaaf nie. Erkenning van vorige leer geskied dus in terme van die toegepaste bevoegdhede wat die aansoeker in die aansoek gedemonstreer het, met inagneming van die uitreeuitkomst wat met die gekose onderrigleerprogram bereik moet word.

The North-West University accepts that recognition of prior learning can and must take place in a valid, trustworthy and fair way, within the normal existing policy on awarding credits to prospective and existing students, whether they are from this or another institution. /

Die Noordwes-Universiteit aanvaar dat die erkenning van vorige leer binne die normale, bestaande beleid oor die toelating van kredietverlening aan voornemende of bestaande studente – hetsy van hierdie of 'n ander instelling – op 'n geldige, betroubare en billike wyse kan en moet geskied.

NAS.1.1.2 Registration/ Registrasie

Registration is the prescribed completed process a student has to follow to register as a student of the North-West University (see General Rule 1.10). / *Registrasie is die voorgeskrewe voltooide proses wat 'n student deurloop het om as student van die Universiteit te registreer (Kyk Algemene Reëls 1.10).*

NAS.1.1.2.1 Registration of additional modules / Registrasie van bykomende modules

Apart from the required modules of the relevant programme, a student may take additional modules in terms of the provision in the General Rule 2.3. This must be requested by means of a student request form and is subject to the approval of the Executive Dean. /

'n Student kan in enige studiejaar, benewens die vereiste modules van die betrokke kurrikulum, bykomende modules neem ooreenkomstig die bepalings in Algemene Reël 2.3.

NAS.1.1.3 Duration of studies / Duur van studie

General Rule 1.14 set the maximum duration of study. / *Algemene Reël 1.14 stel die maksimum duur van studie:*

NAS.1.1.3.1 For full-time contact students, the maximum duration of study is as follows: / Vir voltydse studente is die maksimum duur van studie soos volg:

- One-year qualifications: two years; / *Eenjaar-kwalifikasie: twee jaar*
- Two-year qualifications: four years; / *Tweejaar-kwalifikasie: vier jaar*
- Three-year qualifications: five years; / *Driejaar-kwalifikasie: vyf jaar*
- Four-year qualifications: six years; / *Vierjaar-kwalifikasie: ses jaar*
- Master's degrees: three years; / *Meeestersgraad: drie jaar*
- Doctoral degrees: four years. / *Doktorsgraad : vier jaar*

NAS.1.1.3.2 For part-time contact and distance students, the maximum duration of study is as follows: / Vir deelydse kontak- en afstandstudente, is die maksimum duur van studie soos volg:

- One-year qualifications: three years; / *Eenjaar-kwalifikasie: drie jaar*
- Two-year qualifications: four years; / *Tweejaar-kwalifikasie: vier jaar*
- Three-year qualifications: six years; / *Driejaar-kwalifikasie: ses jaar*
- Four-year qualifications: eight years; / *Vierjaar-kwalifikasie: agt jaar*

- Master's degrees: Four years; / *Meestersgraad: vier jaar*
- Doctoral degrees: Five years. / *Doktorsgraad: vyf jaar*

NAS.1.1.3.3 For contact students in extended programmes, the maximum duration of study is as follows: / *Vir voltydse student in verlengde programme, is die maksimum duur van studie soos volg:*

- Three-year qualifications: six years; / *Driejaar-kwalifikasie: ses jaar*
- Four-year qualifications: seven years. *Vierjaar-kwalifikasie: sewe jaar*

NAS.1.2 FACULTY-SPECIFIC RULES / FAKULTEIT SPESIEFIEKE REÛLS

Programme specific requirements, procedures and structures will be presented in the Yearbook and students are referred to the faculty rules where applicable. The structure, method of delivery and presentation mode of each programme in this Yearbook which are subject to the policy laid down by the Institutional Committee for Academic Standards (ICAS) of the NWU and consistent with the requirements of the Higher Education Act (101 of 1997), the Higher Education Qualifications Sub-framework (HEQSF), the Department of Higher Education and Training (DoHET) and the South African Qualifications Authority (SAQA) (A-Rules 1.1, 1.2 and 2.1). /

Programspesifieke vereistes, prosedures en strukture word elke jaar in die jaarboeke van die fakulteit opgeneem. Die struktuur, metode van aflewering en aanbiedingswyse van elke program is onderhewig aan die beleid wat deur die Institusionele Komitee vir Akademiese Standaarde (IKAS) van die NWU opgestel is en in ooreenstemming is met die vereistes van die Wet op Hoër Onderwys (101 van 1997), die Hoër Onderwys Kwalifikasies Sub-Raamwerk (HOKSR), die Departement van Hoër Onderwys en Opleiding (DHOO) en die Suid-Afrikaanse Kwalifikasies Owerheid (SAKO) (A-ReÛls 1.1, 1.2 and 2.1).

NAS.1.2.1 Amendment of programmes / Wysiging van programme

Converting from one programme to another (including amendment of qualification or programme) is by way of a student request form. The full transcript of the student along with the maximum period of the study, are hereby considered. Admission is subject to the approval of the Executive Dean. / *Omskakeling van een kurrikulum na 'n ander (insluitend wysiging van kwalifikasie of program) geskied by wyse van 'n studenteversoekvorm. Die volle akademiese rekord van die student tesame met die toegelate maksimum duur van die studie, word hierby in ag geneem. Toelating is onderhewig aan die goedkeuring van die Uitvoerende Dekaan.*

NAS.1.2.2 Examinations / Eksaminering

NAS.1.2.2.1 Examination opportunities / Eksamengeleenthede

Examination opportunities and relevant rules are in accordance with the General Rule 1.13.4 and 1.13.6

Die eksamengeleenthede en verbandhoudende reÛls geskied in ooreenstemming met Algemene Reël 1.13.4 en 1.13.6

NAS.1.2.2.2 Composition of the participation mark / Samestelling van die deelnamepunt

The participation mark for a module (General Rule 1.13.1) is compiled from tests, assignments and practical work. For every teaching-learning task (class tests, assignments, exercises etc.) that is carried out by means of formative

assessment in a module, a mark is allocated. A student's participation mark is the weighed mean of all these marks.

The relationship between theory and practical work for the calculation of the participation mark for the modules, is stated in the relevant study guides. /

Die deelnamepunt vir 'n module (Kyk Algemene Reël 1.13.1) word saamgestel uit toetse, werkstukke en praktiese werk. Vir elke onderrigleropdrag (klastoetse, werkstukke, opgawes, ensovoorts) wat uitgevoer word by wyse van formatiewe assessering in 'n module, word 'n punt toegeken. 'n Student se deelnamepunt is die geweegde gemiddelde van hierdie punte.

Die verhouding tussen teorie en praktiese werk vir die berekening van die deelnamepunt vir die modules, word in die betrokke studiegids uiteengesit.

NAS.1.2.2.3 Admission to examinations / Toelating tot die eksamen

- Admission to examinations in any module is granted by acquiring a proof of participation (see General Rule 1.13.2).
- In terms of the General Rule 1.13.2 a proof of participation will only be issued to a student in the Faculty of Natural and Agricultural Sciences if he-
 - has complied with the specific requirements of the module as set out in the relevant study guide;
 - where applicable, has completed the practical work required for a module; and
 - has obtained a participation mark of at least 35% for **first semester first year modules**- only applicable to bona fide first year students. Each successive module requires a participation mark of 40% (see also General Rule 2.5.2).
- Proof of participation obtained for a module for the first examination opportunity is transferred without any change to the second examination opportunity (see General Rule 1.13.2.2). /
- *Toelating tot die eksamen in enige module geskied deur die verwerwing van 'n deelnamebewys (Kyk Algemene Reël 1.13.2).*
- *In terme van Algemene Reël 1.13.2.3 sal 'n deelnamebewys in die Fakulteit Natuur- en Landbouwetenskappe slegs aan 'n student uitgereik word indien die student:*
 - *vol doen het aan die besondere vereistes daarvoor wat in die **studiegids** vir die betrokke module uiteengesit is;*
 - *waar van toepassing, die praktiese werk wat vir 'n module **vereis word**, voltooi het; en*
 - *'n deelnamepunt van minstens 35% vir **eerstesemester, eerstejaar modules**, slegs van toepassing op bona-fide eerstejaar student. Vir elke opeenvolgende module moet 'n deelnamepunt van 40% behaal word. (Kyk ook Algemene Reël 2.5.2).*
- *Die deelnamebewys wat vir 'n module verwerf is vir die eerste eksamen-geleentheid, word net so oorgedra na die tweede eksamengeleentheid (Kyk Algemene Reël 1.13.2.2).*

NAS.1.2.2.4 Relation between credits and examination papers / *Verhouding tussen kredietpunte en eksamenvraestelle*

The duration of an examination paper of a 8 and 12-credit module is usually two hours and the duration of examination papers that count for 16, 24 or 32 credits is usually three hours. /

Die eksamenvraestel vir 'n 8 en 12 kredietpunt module duur gewoonlik twee uur en die eksamenvraestelle van modules wat 16, 24 of 32 kredietpunte tel, duur gewoonlik drie uur.

NAS.1.2.2.5 Relation between credits and teaching periods / *Verhouding tussen krediete en onderrigperiodes*

With regard to practical work (for example Chemistry, Physics, Zoology, Urban and Regional Planning, etc.): four continuous periods every second week are allocated for practical work at the first year level and four continuous periods per week at the second and third year level. Depending on the nature of the different subjects, deviations from this guideline might be found. /

Met betrekking tot praktiese werk (byvoorbeeld Chemie, Fisika, Dierkunde, Stads- en Streekbeplanning, ens): vier aaneenlopende periodes elke tweede week word toegeken vir praktiese werk by die eerstejaarlak en vier aaneenlopende periodes per week aan die tweede en derde jaarvlak. Afhangende van die aard van die verskillende vakke, kan afwykings van hierdie riglyn gevind word.

NAS.1.2.2.6 Number of examination opportunities / *Aantal eksamengeleenthede*

The General Rule 2.8.3 regulates the number of examination opportunities. An implication of these rules is that a student who has not passed a module with the second examination opportunity will not be entitled to exemption from classes.

See General Rule 1.13.6 Dean's concession examination (third examination opportunity)

Students in Actuarial Science, who would like to be considered for actuarial exemption, must write their examinations during the first examination opportunity. Complete requirements for students in Actuarial Science may be obtained from the Director of the Centre for Business Mathematics and Informatics. /

Die aantal eksamengeleenthede word bepaal deur Algemene Reël 2.5.3 'n Implikasie van hierdie reëls is dat 'n student wat 'n module na die tweede eksamengeleentheid nog nie geslaag het nie, nie op klasvystelling geregtig sal wees nie.

Sien Algemene Reël 1.13.6 Dekans finale konsessiegeleentheid (3de eksamengeleentheid)

Studente in Aktuariële Wetenskap, wat in aanmerking wil kom vir aktuariële vystelling, moet hulle eksamen tydens die eerste eksamengeleentheid skryf. Volledige voorskrifte vir studente in Aktuariële Wetenskap is by die direkteur van die Sentrum vir Bedryfswiskunde en Informatika beskikbaar.

NAS.1.2.2.7 Module mark / Modulepunt

Applies only to full-time study: The module mark for every module is calculated (see General Rule 1.13.1) from the participation mark and the examination mark at a 1:1 ratio. Calculation of final module marks for distance students are indicated in the study guide. The weight of the participation mark may be between 30% and 70% of the final module mark.

Slegs van toepassing op voltydse studie: Die modulepunt (Kyk Algemene Reël 1.13.1) word bereken uit die deelnamepunt en die eksamenpunt in die verhouding 1:1. Berekening van finale modulepunte vir afstandstudente word in die studiegids aangedui. Die gewig van die deelnamepunt kan tussen 30% en 70% van die finale modulepunt wees.

NAS.1.2.2.8 Pass requirements of a module / Slaagvereistes van 'n module

The terms and conditions for passing modules are set out in the General Rule 1.13.3. The subminimum for all modules in the examination is 40%. /

Die bepalinge ten opsigte van die slaag van modules is in die Algemene Reël 1.13.3 uiteengesit. Die subminimum in die eksamen vir alle modules is 40%.

NAS.1.2.2.9 Access to and review of marked examination work / Toegang tot gemerkte eksamenwerk

- All students have the right to view their examination scripts and associated memoranda in accordance with faculty rules.
- To view a marked script, the student must submit an application on the relevant form to the faculty administrator. The distance students may apply via the UODL call centre. The students apply officially to the relevant School Director.
- In the case of contact programmes, the application to view the examination script must be submitted within five working days after the module examination results have been published in the case of the first examination opportunity, and within two working days in the case of the second examination opportunity. In the case of distance programmes, the application must be lodged within ten working days.
- Faculty rules must provide procedures for, and the management of the manner in which students may be given access to their examination work.
 - If approved the student may view the answer paper and memorandum in the presence of the lecturer and subject group chairperson concerned. Any bona fide errors can be corrected.
- On the basis of the review of the examination script, a student may request that administrative errors in the calculation of the examination mark be corrected, or that the examination script be remarked on payment of an additional examination fee as per the provisions of Rule 1.13.7.7.
- Scripts and the associated memoranda must be viewed and/or remarked after each examination period and before the date as indicated in the annual University calendar for finalising the examination results. /
- *Alle student het die reg om insae in hul eksamenskryfte en ge-assosieerde memoranda te kry in ooreenstemming met fakulteitstreëls. Die student moet betyds daarvoor op die relevante vorm by die bepaalde fakulteitsadministrateur, aansoek doen. Die afstandstudente moet deur*

die EOAL inbelsentrum, die versoek rig. Die versoek word aan die betrokke Skooldirekteur gerig.

- In die geval van kontak programme, moet aansoek om insae in eksamenskrifte te hê binne vyf dae ingedien word nadat die eksamenresultate bekend gemaak is in die geval van die eerste eksamen geleentheid en binne twee dae in geval van tweede eksamen geleentheid. In die geval van afstandsprogramme moet aansoek binne tien werksdae gedoen word.
- Fakulteitsreëls moet prosedures voorsien vir, en bestuur van die wyse hoe studente insae kan kry in hulle eksamenwerk.
 - Indien goedgekeur, kan die student die antwoordskrif en memorandum in die teenwoordigheid van die betrokke dosent en vakgroepvoorsitter besigtig. Enige bona fide foute kan reggestel word.
- Op die basis van hersiening van eksamenskrifte kan die student versoek dat administratiewe foute reggemaak word, maar indien 'n hermerk versoek word kan dit teen 'n betaling gedoen word. Reël A.1.13.7.7
- Skrifte en geasosieerde memoranda moet hersien word na elke eksamen en binne die datums soos aangedui op die Universiteit se jaarkalender vir finalisering van eksamenpunte.

NAS.1.2.2.10 Exemption from practical work or class attendance in a module: (General Rule 1.12) / Vrystelling van praktiese werk of klasbywoning van 'n module: (Algemene Reël 1.12)

NAS.1.2.3 Registration for final year modules: (General rule 2.4) / Registrasie van finale jaar module: (Algemene reël 2.4)

NAS.1.2.4 Progress in a programme based on prerequisites / Vordering in 'n program gebaseer op voorvereistes

In compiling each programme care has been taken that assumed learning, i.e. the necessary prior knowledge and the general level of insight and experience needed to complete the modules prescribed with ease in a specific semester of a programme, has been acquired in the preceding semesters. A student having failed one or more modules in a preceding semester will therefore probably not be adequately equipped to take the modules of the following semester. Such students are URGENTLY advised to consult the director of the relevant school BEFOREHAND to find out which modules of the semester concerned they may take with a reasonable expectancy of success.

The aim of the rules is to make sure that a student in any semester will only take those modules of which he has the minimum prior knowledge.

A module in any subject may only be taken if it conforms to the requirements regarding the assumed learning, as indicated in the list of modules of the relevant subject. (A-Rule 1.8)

When students change from one programme to another, the entrance level in the new programme will have to be determined in consultation with the director of the school under which the relevant programme falls. /

By die saamstel van elke program, is sorg gedra dat die veronderstelde leer, dit wil sê die nodige voorkennis en algemene vlak van insig en ervaring, wat nodig

is om die modules wat in 'n bepaalde semester van 'n program voorgeskryf is, met gemak te kan volg, reeds in die voorafgaande semesters verwerf is. 'n Student wat een of meer modules in die voorafgaande semesters gesak het, sal dus waarskynlik nie voldoende toegerus wees om die modules van die volgende semester te neem nie. Sulke studente word DRINGEND aangeraai om VOORAF die direkteur van die betrokke skool te raadpleeg om vas te stel watter modules van die betrokke semester hulle wel met 'n redelike verwagting op sukses sal kan loop.

Die reëls het ten doel om te verseker dat 'n student in enige semester slegs daardie modules neem waarvoor die student wel oor die minimum voorkennis beskik. Studente wat van een program na 'n ander program omskakel se intreevlak in die nuwe program sal in oorleg met die direkteur van die skool waaronder die betrokke program resorteer, bepaal word.

'n Module van enige vak kan slegs geneem word indien aan die eise ten opsigte van veronderstelde leer, soos in die modulelys van die betrokke vak aangedui is. (A-Reël 1.8)

NAS.1.2.5 Termination of studies: (General Rule 1.18) / Beëindiging van studies: (Algemene Reël 1.18)

NAS.1.2.6 Attainment of qualification: (General Rule 2.6) / Verwerwing van kwalifikasie: (Algemene Reël 2.6)

A degree is obtained when a student has passed in the examination of all the modules prescribed in the curriculum concerned. /

'n Graad word verwerf wanneer 'n student in die eksamen van al die voorgeskrewe modules wat in die betrokke kurrikulum voorgeskryf word, geslaag het.

NAS.1.2.6.1 Qualification with distinction / Kwalifikasie met onderskeiding

With reference to General Rule 2.6.2 a B-degree is conferred with distinction and has achieved a weighted average of at least 75% in the modules of the major subjects, designated by H, in each curriculum (core modules) and-

- where a full-time student enrolled in a contact programme, completes the programme in the minimum period of study, except if failure to comply with the minimum time requirements is due to the interruption of the study on medical grounds, in which case the executive dean concerned, may approve the award of the degree with distinction (A-Rule 2.6.2.2).
- A part-time student or a student enrolled in a distance programme, must complete the programme within the maximum time specified in the faculty rules in order to qualify for the award of the qualification with distinction (A-Rule 2.6.2.3).
- For purposes of calculating the average, modules completed at other institutions and that are recognised as such by the NWU, must be taken into account (A-Rule 2.6.2.4).

NAS.1.3 PROFESSIONAL STATUS / PROFESSIONELE STATUS

Any person who has obtained one of the following qualifications in a natural science field at a university in South Africa and has acquired experience as indicated below, may register as a Professional Natural Scientist (Pr.Sci.Nat.) with the South African Council for Natural Scientific Professions:

- 4-year BSc or Hons BSc (that preferentially includes a research module), plus three years of experience in a natural science profession;
- MSc and two years of experience in a natural science profession;
- DSc or PhD plus one year of experience in a natural science profession.

First year of study: 70% of the modules passed, should be in natural sciences, namely Biology I (Botany I and Zoology I), Chemistry I, Mathematics I, Physics I or another natural science subject such as Geology 1.

Second and third year of study: 80% of the modules passed should be in the natural sciences of which 50% should be in the respective discipline or directly supportive of the discipline. (Exit level for registration as a Certified Natural Scientist).

Fourth year of study (Honours level): Preferably, 100% of the modules passed should be in the natural sciences of which 80% should be in the respective discipline or directly supportive to nthe discipline. (Exit level for registration as Candidate and Professional Natural Scientist)

Students who have obtained an honours qualification or higher, in Biochemistry may apply to the Health Professions Council of South Africa for registration as an intern medical scientist through an institution that offers such internships. Upon completion of the internship the candidate will be eligible for registration as a medical scientist.

Students who have **registered for** the BSc in Urban and Regional Planning qualification may apply for registration as a Candidate Planner, according to the regulations (Planning Professions Act, 36 of 2002) of the South African Council for Planners (SACPLAN). After a minimum of two years in practice and completion of the instructions for registration, such a student will be able to register as a Professional Planner [Pr.Pln]. /

Enige persoon wat 'n toepaslike vierjarige kwalifikasie in 'n natuurwetenskaplike rigting aan 'n universiteit in Suid-Afrika verwerf het en oor die dienooreenkomstige jare ervaring beskik, kan as Professionele Natuurwetenskaplikes (PrSciNat) by die Suid-Afrikaanse Raad vir Natuurwetenskaplike Professies registreer:

- 'n 4-jarige BSc of 'n Hons BSc (wat verkieslik 'n navorsingsmodule insluit), plus drie jaar ervaring in 'n natuurwetenskaplike profesie;
- 'n MSc en twee jaar ervaring in 'n natuurwetenskaplike profesie;
- 'n DSc of PhD plus een jaar ervaring in 'n natuurwetenskaplike profesie;

Eerstejaar van studie: 70% van die modules wat geslaag word, moet in die natuurwetenskappe wees, naamlik Biologie I (Plantkunde I en Dierkunde I), Chemie I, Fisika I, Wiskunde I, of 'n ander natuurwetenskapvak, bv. Geologie I.

Tweede- en derdejaar van studie: 80% van die modules wat geslaag word moet in die natuurwetenskappe wees, waarvan 50% in die onderskeie dissipline is of direk ondersteunend tot die dissipline. (Uittreenvlak vir registrasie as Gesertifiseerde Natuurwetenskaplike).

Vierdejaar van studie (honneursvlak): Verkieslik 100% van die modules wat geslaag word, moet in die natuurwetenskappe wees, waarvan 80% in die onderskeie dissipline is of direk ondersteunend tot die dissipline. (Uittreenvlak vir registrasie as Kandidaat en Professionele Natuurwetenskaplike).

Studente wat 'n honneurskwalifikasie of hoër, in Biochemie verwerf het, kan aansoek doen by die Raad vir Gesondheidsberoepes van Suid-Afrika om geregistreer te word as 'n intern mediese wetenskaplike deur 'n instansie wat so 'n internskap aanbied. Na voltooiing van die internskap sal die kandidaat in aanmerking kom vir registrasie as 'n mediese wetenskaplike.

Studente wat vir die BSc in Stads- en Streekbeplanning graad **geregistreer is**, kan ingevolge die voorskrifte van die Suid Afrikaanse Raad vir Beplanners in terme van die 'Planning Professions Act (36 of 2002)' aansoek doen vir registrasie as n Kandidaat Beplanner. Na verloop van 'n minimum van twee jaar in die praktyk en nadat aan die voorskrifte vir Registrasie voldoen is, kan sodanige persoon as n Professionele Beplanner registreer word [Pr.Pl.n].

NAS.1.4 MODULES LACKING TO COMPLETE DEGREE / UITSTAANDE MODULES OM GRAAD TE VOLTOOI

If a student lacks **five** modules **at the most** to complete his/her degree, these modules may be completed at UNISA, subject to the following conditions:

- The degree must be completed within **five years**. If it takes longer, a written application must be made for extension of the studies.
- At least **one** core module on third year level must be completed at NWU.
- The student must register at both NWU and UNISA. /

Indien 'n student **hoogstens vyf** modules kort om sy/haar graad te voltooi, kan hierdie modules by UNISA geneem word, onderhewig aan die volgende voorwaardes:

- Die graad moet binne vyf jaar voltooi word. Indien dit langer neem moet skriftelik aansoek gedoen word vir verlenging van studie.
- Minstens een kernmodule moet op derdejaarsvlak by die NWU voltooi word.
- Die student moet by beide instellings, die NWU en UNISA registreer.

NAS.1.5 WARNING AGAINST PLAGIARISM / WAARSKUWING TEEN PLAGIAAT

Assignments are individual tasks and not group activities (unless explicitly indicated as group activities). For further details see:

http://www.nwu.ac.za/content/policy_rules

Werkstukke is individuele take en nie groepsaktiwiteite nie (tensy dit uitdruklik aangedui word as 'n groepsaktiwiteit). Vir meer besonderhede gaan na:

<http://www.nwu.ac.za/af/content/beleide-en-reels>

NAS.1.6 CAPACITY STIPULATION / KAPASITEITSBEPERKINGS

Please take note of the fact that, owing to specific capacity constraints, that the University reserves the right to select candidates for admission to certain fields of study. This means that prospective students who comply with the minimum

requirements may not necessarily be admitted to the relevant courses. (A-Rule 1.5.2.1) /

Neem asb. kennis dat die Universiteit a.g.v. spesifieke kapasiteitsbeperkings hom die reg voorbehou om kandidate vir toelating tot bepaalde studierigtings te keur. Dit beteken dat voornemende studente wat aan die minimum toelatingsvereistes voldoen, nie noodwendig tot die betrokke kursusse toegelaat sal word nie. A.g.v. kapasiteitsbeperkings en die ooraanbod van studente in bepaalde studierigtings, sal studente o.g.v. hulle skoolastiese prestasie gekeur word vir toelating tot hierdie rigtings (A-Reël 1.5.2.1).

NAS.1.7 LANGUAGE MEDIUM / TAALMEDIUM

Mafikeng: The language of instruction in all undergraduate contact sessions is English. / *Die onderrigtaal in alle voorgraadse kontaksessies is Engels.*

Vaal Triangle / Vaaldriehoek: The language of instruction in all undergraduate contact sessions is English, but some modules are presented in both English and Afrikaans. / *Die onderrigtaal in alle voorgraadse kontaksessies is Engels, maar sommige modules word in Engels en Afrikaans aangebied.*

Potchefstroom: The language of instruction in all undergraduate contact sessions is Afrikaans, unless otherwise indicated. Educational interpreting to English will be available in all modules (where requested). All study guides, tests and examination papers are made available to students in both Afrikaans and English. Students may answer any written or oral test or examination in either Afrikaans or English.

Distance Learning IT programme: The language of instruction is English. /

Potchefstroom: *Die onderrigtaal in alle voorgraadse kontaksessies is Afrikaans, tensy anders aangedui. Opvoedkundige tolking na Engels is in alle modules beskikbaar (waar versoek). Alle studiegidse, toetse en eksamenvraestelle word egter in beide Afrikaans en Engels aan studente beskikbaar gestel. Dit staan studente in alle modules vry om enige skriftelike of mondelinge toets of eksamen in Afrikaans of Engels af te lê.*

Afstandslereer IT program: *Die onderrigtaal is in Engels.*

NAS.1.8 PROTECTION OF PERSONAL AND EDUCATION-RELATED INFORMATION / BESKERMING VAN PERSOONLIKE EN OPVOEDKUNDIG-VERWANTE INLIGTING

A-Rule 1.11 stipulate the following:

In the course of the registration process the extent to which the student's personal or education-related information may be disclosed to a third party is determined, but the student may withdraw or amend permission granted to disclose such information by means of a request in writing submitted to the registrar. The university may disclose personal or education-related information regarding a student to a third party only after the law applicable to the protection of and access to information has duly been complied with.

A-Reël 1.11 bepaal die volgende:

In die loop van die registrasieproses word die mate waarin die student se persoonlike of opvoedingsverwante inligting aan 'n derde party openbaar gemaak mag word bepaal, maar die student mag toestemming onttrek of wysig om sodanige inligting bekend te maak deur middel van 'n skriftelike versoek aan die registrateur. Die universiteit kan slegs persoonlike of opvoedingsverwante

inligting rakende 'n student aan 'n derde party bekend maak nadat die wet wat op die beskerming van en toegang tot inligting van toepassing is, behoorlik nagekom is.

NAS.1.9 ACADEMIC LITERACY / AKADEMIESE GELETTERDHEID

All undergraduate students who register at the North-West University for the first time are required to register for a module / modules in academic literacy. They have to pass this module / these modules before they can graduate. /

Alle voorgraadse studente wat vir die eerste keer aan die Noordwes Universiteit registreer, is verplig om vir 'n module / modules in akademiese geletterdheid te registreer. Hulle moet dit slaag, alvorens hulle kan gradueer.

NAS.1.9.1 Testing / Toetsing

Students have to write a compulsory proficiency test (TALL or TAG) in academic literacy, at a time and place determined by the University, in order to determine their ability to function within the academic environment. The purpose of this test is to identify students who, due to inadequate academic literacy skills, may not complete their study programme within the stipulated period in order to empower them with the necessary knowledge and skills. /

Studente moet 'n verpligte vaardigheidstoets (TAG of TALL) in akademiese geletterdheid skryf op 'n gegewe tyd en plek, soos deur die Universiteit bepaal. Die doel van die toets is om studente te identifiseer wat, a.g.v. onvoldoende akademiesegeletterdheidsvaardighede die risiko loop om hulle studieprogram nie suksesvol binne die toegelate tydperk te voltooi nie, sodat hulle met die nodige kennis en vaardighede bemaatig kan word.

Students have the option of writing the compulsory skills test in either English or Afrikaans. With the exception of students who are identified as borderline cases by the test, each student has only one opportunity to write the test. Students who are regarded as borderline cases, will be granted a second opportunity to write the test. It is the student's responsibility to check and verify his/her result within 14 days of writing the test and to register for the correct module in the correct semester (see below). /

Studente besluit self of hulle die verpligte vaardigheidstoets in Afrikaans of in Engels wil aflê. Met die uitsondering van studente wat deur die toets as grensgevalle uitgewys word, kry elke student slegs een geleentheid om die toets af te lê. Studente wat as grensgevalle beskou word, kry 'n tweede geleentheid. Dit is die student se verantwoordelikheid om hom-/haarself binne 14 dae na aflegging van die toets van sy/haar uitslag te vergewis en vir die korrekte module in die korrekte semester te registreer (sien hieronder).

NAS.1.9.2 Module(s): Academic Literacy Development (ALDE111) / Ontwikkeling van Akademiese Geletterdheid (ALDA111)

All students in the Faculty of Natural and Agricultural Sciences are required to register for the module ALDE111 [English] or ALDA111 [Afrikaans], depending on the language of the compulsory proficiency test. The only exception is students who are enrolled for the following programmes: Quantitative Risk Management, Financial Mathematics, Business Analytics, Actuarial Science, Information Technology, Urban and Regional Planning. This exception is not applicable if a student has been identified as being at risk by the aforementioned test. He/she is then also required to take ALDE111 or ALDA111. /

Alle studente in die Fakulteit Natuur- en Landbouwetenskappe is verplig om vir die module ALDA111 [Afrikaans] óf ALDE111 [Engels] te registreer, afhangend van die taal waarin hulle die verpligte vaardigheidstoets afgelê het. Die enigste uitsondering is studente wat ingeskryf is vir die volgende programme: Kwantitatiewe Risikobestuur, Finansiële Wiskunde, Bedryfsanalise, Aktuariële Wetenskap, Inligtingstegnologie, Stads- en Streeksbeplanning. Hierdie uitsondering is egter nie van toepassing op bogenoemde programme nie, indien die student as 'n risikokandidaat aangemerkt word deur bogenoemde toets en hy/sy dan verplig word om ook ALDA111 óf ALDE111 te volg.

i. Level and credits / Vlak van krediete

This module is on NQF level 5 and worth 12 credits (additional credits). In exceptional cases it will be calculated in terms of curriculum credits. It thus carries a weight of 12 credits in the first-year curriculum in these cases. /

Hierdie module is op NKR-vlak 5 en het 'n waarde van 12 krediete (addisionele krediete). In uitsonderlike gevalle word dit wel vir kredietdoeleindes van die kurrikulum in berekening gebring. Krediete hiermee verdien, kan dus 'n gewig dra van 12 krediete in die eerstejaarskurrikulum.

ii. Composition of module and calculation of module marks / Samestelling van module en punteberekening

- ALDE111 / ALDA111 comprises one component only, which includes two periods per week. Class attendance is compulsory. The module is only presented in Semester 1. /

ALDA111 / ALDE111 bestaan uit slegs een komponent wat minstens twee periodes per week behels en klasbywoning is verpligtend. Die module word slegs in Semester 1 aangebied.

- A system of continuous assessment is followed. The final module mark is calculated as follows: Exam mark = 40% and Participation mark = 60%. For admission to the exam in ALDE111 / ALDA111, a participation mark of 40% is required. /

'n Stelsel van deurlopende assessering word gebruik. Die finale modulepunt word soos volg bereken: Eksamenpunt = 40% en Deelnamepunt = 60%. Vir toelating tot die eksamen in ALDA111 / ALDE111 word 'n deelnamepunt van 40% vereis.

- Note that for conditional admission to ALDE122 / ALDA122, a student who is required to follow ALDE111 / ALDA111 should obtain a module mark of 40% minimum for ALDE111 / ALDA111. /

Let daarop dat vir voorwaardelike toelating tot die module ALDA122 / ALDE122 moet 'n student wat verplig is om eers ALDA111 / ALDE111 te volg, 'n modulepunt van minstens 40% in ALDA111 / ALDE111 verwerf.

- A final module mark of 50% is required to pass the module. /

'n Finale modulepunt van 50% is nodig om die module te slaag.

iii. Important additional information / Belangrike addisionele inligting

Specific faculty rules in terms of termination of studies might apply if a student fails ALDE111 / ALDA111. /

Spesifieke fakulteitsreëls i.t.v. terminering van studies kan van toepassing wees indien 'n student ALDA111 / ALDE111 nie slaag nie.

Students who have already successfully completed a module similar to ALDE111 / ALDA111 at another tertiary institution and can provide proof of this, may apply in writing on the prescribed form for formal recognition for the module. This application should be submitted to the subject chair responsible for Academic Literacy. Recognition is only granted in cases where the modules are on the same NQF level (NQF5), where the credit values are of the same value (12), and where content is comparable. /

Studente wat reeds 'n module soortgelyk aan ALDA111 / ALDE111 suksesvol aan 'n ander tersiêre instelling voltooi het en bewys daarvan kan lewer, kan skriftelik op die voorgeskrewe vorm by die betrokke entiteit verantwoordelik vir Akademiese Geletterdheid om erkenning aansoek doen. Erkenning word slegs toegestaan in gevalle waar die modules op dieselfde NKR-vlak is (NKR5), die kredietwaarde minstens dieselfde is (12) en die inhoud vergelykbaar is.

iv. Language and mode of delivery / Taal en modus van aanbieding

ALDE111 is presented in English and ALDA111 in Afrikaans. The module is presented in both contact and open distance learning mode. Note that only students who are formally registered for open distance learning may follow the module in this mode. Moreover, open distance learning is presented in English only. /

ALDA111 word in Afrikaans aangebied en ALDE111 in Engels. Die module word in beide kontak- en afstandsmodusse aangebied, maar let daarop dat slegs studente wat formeel vir afstandsonderrig geregistreer is, dit in die afstandsmodus mag volg. Afstandsmodes word verder slegs in Engels aangebied.

v. Outcomes / Uitkomst

On completion of this module students should be able to:

- bridge the gap between secondary school and university education;
- access academic information effectively in order to understand academic texts;
- process academic information successfully; and
- produce academic information responsibly and appropriately. /

By afhandeling van hierdie module behoort die student in staat te wees om:

- *die gaping tussen hoërskool en universiteit te oorbrug;*
- *op effektiewe wyse toegang tot akademiese inligting te verkry met die doel om akademiese tekste te verstaan;*

- *akademiese inligting suksesvol te prosesseer; en*
- *akademiese inligting gepas en verantwoordelik te produseer.*

NAS.1.9.2.1 Academic Literacy Development (ALDE122) / Ontwikkeling van Akademiese Geletterdheid (ALDA112 or 122)

All students in the Faculty of Natural and Agricultural Sciences, regardless of the result obtained for the compulsory proficiency test in academic literacy, must register for the module ALDE122 [English] / ALDA112 or ALDA122 [both in Afrikaans].

Alle studente in die Fakulteit Natuur- en Landbouwetenskappe, ongeag die uitslag van die verpligte vaardigheidstoets in akademiese geletterdheid, moet die module ALDA112 of ALDA122 [beide in Afrikaans] / ALDE122 [Engels] neem

Students whose preferred teaching and learning language is Afrikaans, and who do not need to complete ALDA111, register for ALDA112 in Semester 1. This arrangement is only applicable to students registered for the following programmes: Quantitative Risk Management, Financial Mathematics, Business Analytics, Actuarial Science, Information Technology, Urban and Regional Planning. Students who are required to enrol for ALDA111, register for ALDA122 in Semester 2, regardless of the programme they are registered for.

All other students with Afrikaans as language of teaching and learning, register for ALDA122 in Semester 2.

Note that ALDA112 and ALDA122 are exactly the same module presented in both semesters. The module codes, however, differ in order to distinguish between the semesters.

Studente met Afrikaans as onderrigtaal en wat nie ALDA111 hoef te volg nie, registreer vir ALDA112 in Semester 1. Hierdie reëling is slegs van toepassing op studente wat in die volgende programme geregistreer is: Kwantitatiewe Risikobestuur, Finansiële Wiskunde, Bedryfsanalise, Aktuariële Wetenskap, Inligtingstegnologie, Stads- en Streeksbeplanning. Studente wat ALDA111 moes volg, registreer vir ALDA122 in Semester 2, ongeag die program waarvoor hulle geregistreer is.

Alle ander studente met Afrikaans as onderrigtaal, registreer vir ALDA122 in Semester 2.

Let daarop dat ALDA112 of ALDA122 dieselfde module is wat in beide semesters aangebied word, maar waarvan die modulekode verskil om die onderskeid in semester te tref.

Students with English as language of teaching and learning, regardless of the programme they are registered for, register in all cases for ALDE122 in Semester 2.

Studente met Engels as onderrigtaal, ongeag die program waarvoor hulle geregistreer is, registreer in alle gevalle vir ALDE122 in Semester 2.

i. Level and credits / vlak en krediete

This module is on NQF level 5 and worth 12 credits. Note that it is calculated in terms of curriculum credits. It thus carries a weight of 12 credits in the first-year curriculum.

Hierdie module is op NKR-vlak 5 en het 'n waarde van 12 krediete. Let daarop dat dit wel vir kredietdoeleindes van die kurrikulum in berekening gebring word. Krediete hiermee verdien, dra dus 'n gewig van 12 krediete in die eerstejaarskurrikulum.

ii. Composition of module and calculation of module marks / samestelling van module en punteberekening

For admission to the module ALDE122 / ALDA122, a student must first pass ALDE111 / ALDA111. In all other cases students have immediate access to ALDE122 [Semester 2] / ALDA112 [Semester 1] or ALDA122 [Semester 2].

Vir toelating tot die module ALDA112 of ALDA122 / ALDE122 moet 'n student wat verplig is om eers ALDA111 / ALDE111, laasgenoemde slaag. In alle ander gevalle het studente onmiddellik toegang tot ALDA112 [Semester 1] of ALDA122 [Semester 2] / ALDE122 [Semester 2].

A final mark of at least 40% in ALDE111 / ALDA111 only grants students conditional entry to ALDE122 or ALDA122. Students who were allowed to continue with ALDE122 / ALDA122 and who passed the examination in this module, may have the result for ALDE111 / ALDA111 condoned to a pass by the entity concerned with Academic Literacy.

'n Finale punt van ten minste 40% in die module ALDA111 / ALDE111 verleen voorwaardelik toelating tot ALDA122 / ALDE122. Indien die eksamen daarin geslaag word, kan die uitslag van ALDA111 / ALDE111 deur die betrokke entiteit verantwoordelik vir Akademiese Geletterdheid tot 'n slaagpunt gekondoneer word.

The module ALDE122 / ALDA112 or ALDA122 comprises three compulsory components: an Academic Literacy component, a Computer and Information Literacy component and a Reading component. For the academic literacy component class attendance of two periods per week is compulsory. Computer and Information Literacy requires that students learn autonomously, but they will have access to contact sessions should they wish to make use thereof. Students are also required to attend a number of sessions in the Reading laboratory. Depending on a student's reading speed and comprehension, he/she could be required to attend more sessions. A student must pass all three components to pass the module.

Die module ALDA112 of ALDA122 / ALDE122 bestaan uit drie verpligte komponente: Akademiese Geletterdheid, Rekenaar- en Inligtingsvaardighede en 'n Leeskomponent. Akademiese Geletterdheid behels twee lesings per week en klasbywoning is verpligtend. Rekenaar- en Inligtingsvaardighede word op outonome wyse bemeester, maar daar is ook verskeie geleenthede tot kontaksessies tot studente se beskikking indien hul daarvan gebruik wil maak. Studente word ook verplig om vir 'n aantal sessies die dienste van die Leeslaboratorium te gebruik. Afhangend van die student se leesspoed en -begrip kan hy/sy verplig word om meer of minder sessies by te woon. Al drie komponente moet geslaag word om die module te kan slaag.

A system of continuous assessment is followed. The final module mark is calculated as follows: Exam mark = 40% and Participation mark = 60%. For admission to the exam in ALDE122 / ALDA112 / ALDA122, a participation mark of 40% is required.

'n Stelsel van deurlopende assessering word gebruik. Die finale modulepunt word soos volg bereken: Eksamenpunt = 40% en Deelnamepunt = 60%. Vir toelating tot die eksamen in ALDA112 of ALDA122 / ALDE122 word 'n deelnamepunt van 40% vereis.

The exam consists of two papers, namely Academic Literacy and Computer and Information Literacy. The subminimum required to pass the Academic Literacy component, is 40%. The subminimum required to pass the Computer and Information Literacy component, is 50%. These components are dealt with in a 80:20 ratio when calculating the final mark (80% for the academic literacy and 20% for the computer and information literacy component). For the Reading component, a code for sufficient or insufficient is issued. A final module mark of 50% is required to pass the module.

Die eksamen bestaan uit twee vraestelle, naamlik Akademiese Geletterdheid en Rekenaar- en Inligtingsvaardighede. Die subminimum wat vir eersgenoemde komponent behaal moet word om die module te kan slaag, is 40%. Die subminimum wat vir laasgenoemde komponent behaal moet word om die module te kan slaag, is 50%. Hierdie twee komponente word in 'n 80:20-verhouding hanteer vir die berekening van die finale punt – 80% vir die eerste komponent (Akademiese Geletterdheid) en 20% vir die tweede komponent (Rekenaar- en Inligtingsvaardighede). Vir die Leeslaboratorium word slegs 'n kode vir voldoende of onvoldoende uitgereik. 'n Finale modulepunt van 50% is nodig om die module te slaag.

iii. Important additional information / Belangrike addisionele inligting

Specific faculty rules in terms of termination of studies might apply if a student fails ALDE122 / ALDA112 / 122.

Students who have already successfully completed a similar module to ALDE122 / ALDA112 or ALDA122 at another institution and can provide proof of this, may apply in writing on the prescribed form for formal recognition of the module. This application should be submitted to the subject chair responsible for Academic Literacy. Recognition is only granted in cases where the modules are on the same NQF level (NQF5), where the credit values are the same value (12), and where content is comparable.

Spesifieke fakulteitsreëls i.t.v. terminering van studies kan van toepassing wees indien 'n student ALDA112 OF ALDA122 / ALDE122 nie slaag nie.

Studente wat reeds 'n module soortgelyk aan ALDA112 of ALDA122 / ALDE122 suksesvol aan 'n ander tersiêre instelling voltooi het en bewys daarvan kan lewer, kan skriftelik op die voorgeskrewe vorm by die betrokke entiteit verantwoordelik vir Akademiese Geletterdheid om erkenning aansoek doen. Erkenning word slegs toegestaan in gevalle waar die modules op dieselfde NKR-vlak is

(NKR5), die kredietwaarde minstens dieselfde is (12) en die inhoude vergelykbaar is.

iv. Language and mode of delivery / Taal en modus van aanbieding

ALDE122 is presented in English and ALDA112 or ALDA122 in Afrikaans. The module is presented in both contact and open distance learning mode. Note that only students who are formally registered for open distance learning may follow the module in this mode. Moreover, open distance learning is presented in English only.

ALDA112 of ALDA122 word in Afrikaans aangebied en ALDE122 in Engels. Die module word in beide kontak- en afstandsmodusse aangebied, maar let daarop dat slegs studente wat formeel vir afstandsonderrig geregistreer is, dit in die afstandsmodus mag volg. Afstandsmodule word verder slegs in Engels aangebied.

v. Outcomes / Uitkomst

On completion of this module students should be able to:

- successfully become part of the academic learning community and participate in this community;
- access information in a responsible and ethical way in order to write an academic text;
- process information strategically in order to write an academic text;
- produce an academic text;
- read at an acceptable speed accompanied by acceptable level of comprehension; and
- demonstrate a fundamental level of computer and information literacy.

By afhandeling van hierdie module behoort die student in staat te wees om:

- *suksesvol in te skakel by die akademiese leeromgewing en daaraan deel te neem;*
- *op eties-verantwoordelike wyse te soek vir inligting wat nodig is vir die skryf van 'n akademiese teks;*
- *inligting op 'n strategiese manier te verwerk met die doel om 'n akademiese teks te kan skryf;*
- *'n akademiese teks te produseer;*
- *teen 'n aanvaarbare spoed en begripvlak te lees; en*
- *'n fundamentele vlak van rekenaar- en inligtingsgelettertheid te demonstreer.*

NAS.1.10 PROVISIONAL ADMISSION REQUIREMENTS FOR UNDER-GRADUATE STUDIES / VOORLOPIGE TOELATINGSVEREISTES VIR VOORGRAADSE STUDIE

NAS.1.10.1 GENERAL ADMISSION REQUIREMENTS / ALGEMENE TOELATINGSVEREISTES

Taking due cognizance of the General Rules and Faculty rules as contained in the relevant yearbooks and with specific reference to the A-rule that determines a National Senior Certificate has been obtained and that the minimum statutory requirements for admission to Diploma and/or B-degree studies at a university in the RSA have been complied with, the University reserves the right to consider candidates' applications on the basis of their results./

Met inagneming van die Algemene Reëls en Fakulteitsreëls soos vervat in die betrokke jaarboeke en met spesifieke verwysing na die A-Reël wat bepaal dat 'n Nasionale Seniorcertifikaat verwerf is en dat daar voldoen is aan die minimum statutêre vereistes vir toelating tot Diploma en/of B-gradstudie aan 'n universiteit in die RSA, behou die Universiteit hom die reg voor om aan die hand van resultate oorweging aan kandidate se aansoeke te verleen.

NAS.1.10.2 CALCULATION OF THE ADMISSION POINTS SCORE (APS) SCORE / BEREKENING VAN DIE AKADEMIESE PRESTASIESKAAL(APS) TELLING

APS for Standard Grade only applies to Grade 12 learners 2007 and before. / APS vir Standaard Graad is slegs van toepassing op Graad 12 leerders 2007 en daarvoor. The University uses the M-Score (Matric score) rating system which awards points to 4 relevant matric subjects passed, according to the scale below. /

Die Universiteit maak van die M-telling gebruik, waarvolgens punte toegeken word, aan 4 relevante matriekvakke geslaag, volgens die skaal hieronder.

Please note that the minimum rating points depend on the programme./ *Neem kennis dat die minimum telling afhang van die spesifieke program.*

NAS.1.10.2.1 Selection model: Determining the APS (Academic Performance Scale) / Keuringsmodel: Bepaling van die APS (Akademiese Prestasieskaal)

The University uses the (Academic Point Score) **APS-Score** rating system which awards points to 6 relevant National Senior Certificate (NSC) subjects. / *Die Universiteit maak gebruik van die (Akademiese Punte Skaal) **APS-Keuringsmodel**, waarvan aan 6 relevante Nasionale Senior Sertifikaat (NSS) vakke, punte toegeken word.*

Marks / Punte	APS score/ APS-telling	MATRIC (M-Score) 2007 and before (M-Telling) 2007 en daarvoor	
NSC scale / NSS beoordelingswaarde		Higher Grade / Hoër Graad	Standard Grade Standaard Graad
		<p>A maximum of 4 subjects are used to determine the M Score.</p> <p>N.B. The score of the most appropriate subject presented for the relevant field of study will carry double weight. / 'n Maksimum van 4 vakke word gebruik om die M-telling te bepaal.</p> <p>L.W. Die telling van die toepaslikste vak vir die betrokke studierigting dra dubbele gewig.</p>	
8(90-100%)	8		
7(80-89%)	7	A=6	
6(70-79%)	6	B=5	A=5
5(60-69%)	5	C=4	B=4
4(50-59%)	4	D=3	C=3
3(40-49%)	3	E=2	D=2
2(30-39%)	2	F=1	E=1
1(0-29%)	1	G	F

NAS.1.10.2.2 APS score / APS-telling

The results of 6 subjects are used to determine the APS score: The results obtained in four prescribed (designated) and two NSC subjects are used for the calculation of the APS Score. The achievement in Life Orientation (LO) will not be used in computing the APS score. An achievement level of 5 in LO and higher will, however, be regarded as a recommendation for admission in borderline cases and admission to certain programmes. A pass at level 3 (40%) is required to obtain an NSC.

/
Die prestasie wat in 6 vakke behaal is, word gebruik om die APS-telling te bereken:

Die prestasie behaal in vier aangewese en twee NSS-vakke word in die berekening van die APS-telling gebruik. Die punt behaal in Lewensoriëntering word nie in berekening gebring nie. 'n APS-punt wat in LO behaal is op skaal 5 of hoër sal alleenlik in aanmerking geneem word by die oorweging van grensgevalle of as aanbeveling vir toelating tot bepaalde programme. 'n Skaalpunt van 3 (40%) in Lewensoriëntering (LO) moet behaal word ten einde 'n Nasionale Senior Sertifikaat (NSS) te verwerf.

NAS.1.10.3 Language requirement / Taalvereiste

A pass at level 4 (50-59%) in two languages, including the language of instruction on either the Home or First additional Language level. /

'n Slaagsyfer van 50-59% (vlak 4) in twee tale, insluitend die taal van leer en onderrig op Huistaal- of Eerste Addisionele taalvlak.

NAS.1.10.4 Faculty specific admission requirements / Fakulteit spesifieke toelatingsvereistes

The rules of the Faculty must be read in conjunction with the general academic rules of the University. A student wishing to enrol for any module offered in the Faculty must meet all the requirements stipulated for that module. To be admitted to a degree or a diploma programme in the Faculty an applicant must comply with the requirements of the general academic rule 1.1 and any additional requirements stipulated for that programme. /

Die reëls van die Fakulteit moet tesame met die algemene akademiese reëls van die Universiteit gelees word. 'n Student wat wil inskryf vir enige module wat in die Fakulteit aangebied word, moet voldoen aan al die vereistes wat vir die betrokke module gestel word. Om tot 'n graad- of 'n diplomaprogram in die Fakulteit toegelaat te word, moet 'n aansoeker voldoen aan die vereistes van die algemene akademiese reël 1.1 en enige bykomende vereistes wat vir daardie program gestel word.

NAS.1.10.4.1 Mathematics requirement / Wiskunde-vereiste

A student who wishes to follow any module in Mathematics, with the exception of Mathematical Techniques (MTHS112, MTHS113 or MTHS123) and Applied Calculus I (MTHS114), must have obtained a mark of at least 60% (level 5) in the grade 12 Mathematics exam or at least 70% (level 6) in another Mathematics exam considered by the Senate as equivalent to the above. /

'n Student wat enige module in Wiskunde wil volg, uitgesonderd Wiskundige Tegnieke (MTHS112, MTHS113 of MTHS123) en Toegepaste Calculus I (MTHS114), moet in die graad 12 eksamen in Wiskunde 'n punt van minstens 60% (vlak 5) of minstens 70% (vlak 6) in 'n ander eksamen in Wiskunde wat die Senaat as gelykwaardig aan bogenoemde ag, behaal het.

Comments / Opmerkings

- Students who do not meet these requirements, but who managed to obtain a Mathematics mark of at least 50% (level 4) or at least 60% (level 5) in another Mathematics exam considered by the Senate as equivalent to the above, are admitted to a Mathematics refresher course presented in January by the School of Mathematical and Statistical Sciences, on the Potchefstroom and Mafikeng Campuses. If such students perform satisfactorily in the tests taken during this course, they may be considered for admission to Mathematics modules. /

Studente wat nie aan hierdie vereistes voldoen nie, maar in Wiskunde wel 'n punt van minstens 50% (vlak 4) of minstens 60% (vlak 5) in 'n ander eksamen in Wiskunde wat die Senaat as gelykwaardig aan bogenoemde ag, behaal het, word toegelaat tot 'n Wiskunde opknappingskursus wat in Januarie deur die Skool vir Wiskundige en Statistiese Wetenskappe aangebied word, op die Potchefstroom- en Mafikengkampus. Indien sodanige studente voldoende presteer in die toetse wat tydens hierdie kursus afgeneem word, kan hulle in aanmerking kom vir toelating tot Wiskundemodules.

All bona fide first year students enrolled for programs/curriculums which include the module(s) MTHS111/114 must attend the refresher course. / *Alle bona fide eerstejaars wat vir programme/kurrikulums registreer wat die module(s) MTHS111/114 bevat, moet die Wiskunde opknappingskursus doen.*

- A student who wishes to follow any module in Mathematics, with the exception of Mathematical Techniques (MTHS112, MTHS113 or MTHS123) and Applied Calculus I (MTHS114), must have obtained a mark of at least 60% (level 5) in the grade 12 Mathematics exam or at least 70% (level 6) in another Mathematics exam considered by the Senate as equivalent to the above. / *'n Student wat enige module in Wiskunde wil volg, uitgesonderd Wiskundige Tegnieke (MTHS112, MTHS113 of MTHS123) en Toegepaste Calculus I (MTHS114), moet in die graad 12 eksamen in Wiskunde 'n punt van minstens 60% (vlak 5) of minstens 70% (vlak 6) in 'n ander eksamen in Wiskunde wat die Senaat as gelykwaardig aan bogenoemde ag, behaal het.*
- Prospective students who do not meet the grade 12 requirement for enrolling in MTHS111 can gain admission to MTHS111 in the second year of study, by passing the module Mathematical Techniques (MTHS112, MTHS113 or MTHS123) with at least 60% or Applied Calculus I (MTHS114) with at least 50% in the first year of study, provided that persons seeking to follow this route to obtain admission to programmes that would otherwise have been inaccessible to them, should take into consideration that they may not be able to complete their studies in the minimum period. / *Voornemende studente wat nie aan die graad 12-vereiste voldoen om vir MTHS111 in te skryf nie, en ook nie die opknappings- kursus bygewoon het nie, kan in die tweede studiejaar toelating tot MTHS111 verkry deur in die eerste studiejaar die module in Wiskundige Tegnieke (MTHS112,*

MTHS113 of MTHS123) met ten minste 60% of Toegepaste Calculus I (MTHS114) met ten minste 50% te slaag, met dien verstande dat persone wat langs hierdie weg toelating wil kry tot programme wat andersins vir hulle ontoeganklik sou wees, in ag moet neem dat hulle moontlik nie hulle studie in die minimum tydperk sal kan afhandel nie

- A student who wishes to follow Mathematical Techniques (MTHS112, MTHS113 or MTHS123) has to comply with prerequisites of the programme the student intends to study. If a student wishes to take Mathematical Techniques (MTHS112, MTHS113 or MTHS123) in order to qualify for MTHS111 in the next year, or for non-degree purposes, the student must have obtained a mark of at least 40% (level 3) in the grade 12 Mathematics exam, or at least 50% (level 4) in another Mathematics exam considered by the Senate as equivalent to the above. / *'n Student wat Wiskundige Tegnieke (MTHS112, MTHS113 of MTHS123) wil neem, moet aan die programvereistes van die program waarvoor die student wil inskryf, voldoen. Indien 'n student Wiskundige Tegnieke (MTHS112, MTHS113 of MTHS123) wil neem om toelating tot MTHS111 in die volgende jaar te verkry, of vir nie-graaddeleindes, moet die student óf in die graad 12-eksamen in Wiskunde 'n punt van minstens 40% (vlak 3), óf minstens 50% (vlak 4) in 'n ander eksamen in Wiskunde behaal het, wat die Senaat as gelykwaardig aan voorgenoemde ag.*
- A student who wishes to follow Applied Calculus I (MTHS114) has to comply with prerequisites of the program the student intends to study. If a student wishes to take Applied Calculus I (MTHS114) in order to qualify for MTHS111 in the next year, or for non-degree purposes, the student must have obtained a mark of at least 50% (level 4) in the grade 12 Mathematics exam, or at least 60% (level 5) in another Mathematics exam considered by the Senate as equivalent to the above. / *'n Student wat Toegepaste Calculus I (MTHS114) wil neem, moet aan die programvereistes van die program waarvoor die student wil inskryf, voldoen. Indien 'n student Toegepaste Calculus I (MTHS114) wil neem om toelating tot MTHS111 in die volgende jaar te verkry, of vir nie-graaddeleindes, moet die student óf in die graad 12-eksamen in Wiskunde 'n punt van minstens 50% (vlak 4), óf minstens 60% (vlak 5) in 'n ander eksamen in Wiskunde behaal het, wat die Senaat as gelykwaardig aan voorgenoemde ag.*

NAS.1.10.4.2 Admission Requirements for Programmes / Toelatingsvereistes vir Programme

NAS.1.10.4.2.1 Diplomas

Students who have not achieved the required points for entry into BSc Agric may be admitted into any of the three Agriculture Diploma Programmes (Students need a “Diploma” matric pass).

University Diploma in Animal Health Dip (3 yr / jr) MC					
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- Plus Keuringsvereistes	NSC Plus vakke	APS	Selection Test / Keurings-toets
	2DY B01 N302M (1 st - 2 nd yr) N301M (3 rd yr only) (Old programme phasing out 266100-N102M Pipeline/ <i>pyplyn</i>)	*English Level 3 *Mathematics Level 3 *Physical Science Level 3 OR Life Sciences Level 3 (40-49%)		19	No
University Diploma in Animal Science (3 yr / jr) MC					
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- Plus Keuringsvereistes	NSC Plus vakke	APS	Selection Test / Keurings-toets
	2FH B01-N301M (1 st - 2 nd yr) (Old programme phasing out 279100-N101M 3 rd yrs only)	*English Level 3 *Mathematics Level 3 (40-49%) OR Mathematical Literacy Level 5 (60-69%) *Physical Science Level 3 OR Life Sciences Level 3 OR Agricultural Sciences Level 4 (50-59%)		19	No

University Diploma in Plant Science Dip (3 yr / jr) MC					
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- Plus Keuringsvereistes	NSC Plus vakke	APS	Selection Test / Keurings-toets
Crop Production	2FJ B01-N301M (1 st - 2 nd yr)	*English Level 3 *Mathematics Level 3 (40-49%) OR Mathematical Literacy Level 5 (60-69%) *Physical Sciences Level 3 OR Life Sciences Level 3 OR Agricultural Sciences Level 4 (50-59%)		19	No
Univ Diploma in Plant Science (Crop Science)	279101 N103M	Phasing out from 2018 . No new intake.			

Farm Practical

A student studying agriculture will be required to gain farm practical experience of a minimum duration, as prescribed for a particular study programme, at an approved institution under the guidance of an approved supervisor. A mark will be awarded for each completed period of farm practical experience.

A student studying agriculture will be required to carry out practical Farm/Laboratory work at various times during semesters.

NAS.1.10.4.2.2 BSc- Extended Degree

Students who have not achieved the required points for entry into BSc may be admitted into the BSc Extended (BSc-e) Programme. (Students need a "Bachelors" matric pass.)

Extended Bachelor of Science BSc (4 yr / jr) MC (Refer to list NAS1.13)					
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- Plus Keuringsvereistes	NSC Plus vakke	APS	Selection Test / Keurings-toets
See list of programmes NAS1.13	See list NAS1.13. (Old programmes 279101 N101 M)	*English Level 3 *Mathematics Level 3 *Life Science Level 3 OR Physical Science Level 3 (40-49%)		22	No

Extended Bachelor of Science in Information Technology <i>Verlengde Baccalaureus Scientiae in Inligtingstegnologie</i> BSc (4 yr / jr) VTC				
WITH Specialisation In / <i>MET Spesialisering in</i>	Programme and Curriculum code / <i>Program- en Kurrikulum-kode</i>	Required Subjects Selection Criteria / <i>Vereiste NSS- Plus Keuringsvereistes</i>	NSC Plus APS	Selection Test / <i>Keurings-toets</i>
	2XX H01-N301V (1 st - 3 rd yr) (Old/ Ou 264102-302V 4 th yrs only)	Mathematics level 3 / <i>Wiskunde vlak 3</i> (40-49%)	24	No
Extended Bachelor of Science in <i>Financial Mathematics /</i> <i>Verlengde Baccalaureus Scientiae in Finansiële Wiskunde</i> BSc (4 yr / jr) VTC				
WITH Specialisation In / <i>MET Spesialisering in</i>	Programme and Curriculum code / <i>Program- en Kurrikulum-kode</i>	Required Subjects Selection Criteria / <i>Vereiste NSS- Plus Keuringsvereistes</i>	NSC Plus APS	Selection Test / <i>Keurings-toets</i>
	2XS H01-N301V (1 st - 3 rd yr) (Old/ Ou 200 208 N301V 4 th yrs only)	Mathematics level 4 (50-59%) <i>Wiskunde vlak 4</i>	28	No / <i>Nee</i>

**Extended Bachelor of Science in Quantitative Risk Management /
Verlengde Baccalaureus Scientiae in Kwantitatiewe Risikobestuur
BSc (4 yr / jr) VTC**

WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
	2XT H01-N301V (1 st - 3 rd yr) (Old/ Ou 200 207-N301V - 4 th yrs only)	Mathematics level 4 (50-59%) Wiskunde vlak 4	4 4	28	No / Nee

**Extended Bachelor of Science in Business Analytics /
Verlengde Baccalaureus Scientiae in Bedryfsanalise
BSc (4 yr / jr) VTC**

WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
Data Mining / Data-ontginning	2XR H01-N301V (1 st - 3 rd yr) (Old/ Ou 200 198-N302V - 4 th yrs only)	Mathematics level 4 (50-59%) Wiskunde vlak 4	4 4	28	No / Nee

Bachelor of Science / Baccalaureus Scientiae BSc (3 yr / jr)					
Senior students will register in 2018 for the same qualification code for which they were registered in 2017. / <i>Senior-studente moet in 2018 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2017 geregistreer was.</i>					
WITH Specialisation In / MET Spesialisering in	Programme & Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
Chemistry and Physics / <i>Chemie en Fisika</i>	2FF H05 N301P (1 st - 2 nd yr) (Old/ Ou 200190-N151P 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 5 (60-69%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / Nee
Chemistry and Physics	2FF H05 N301M (1 st - 2 nd yr) (Old 200129-308M 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%)		26	No
Chemistry, Mathematics and Applied Maths / <i>Chemie, Wiskunde en Toegepaste Wisk</i>	2FF H22-N301P (1 st - 2 nd yr) (Old/ Ou 200190-N152P 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 5 (60-69%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / Nee
Applied Mathematics and Chemistry	2FF H13-N301M (1 st - 2 nd yr) (Old 200169-N302M-3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) /		26	No
Chemistry and Mathematics	2FF H11-N301M (1 st - 2 nd yr) (Old 200140-N307M-3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) /		26	No

Bachelor of Science / <i>Baccalaureus Scientiae</i> BSc (3 yr / jr)					
WITH Specialisation In / <i>MET Spesialisering in</i>	Programme & Curriculum code / <i>Program- en Kurrikulum-kode</i>	Required Subjects Selection Criteria / <i>Vereiste NSS- Plus Keuringsvereistes</i>	NSC Plus vakke	APS	Selection Test / <i>Keurings-toets</i>
Biochemistry and Chemistry / <i>Biochemie en Chemie</i>	2FF H06 N301P N301M (1 st - 2 nd yr) (Old/ Ou 200190-N174P; N174M- 3 rd yrs only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / <i>Nee</i>
Physics and Mathematics / <i>Fisika en Wiskunde</i>	2FF H23 N301P (1 st - 2 nd yr) (Old/ Ou 200190-N154P 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 5 (60-69%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / <i>Nee</i>
Physics and Mathematics	2FF H23 N301M (1 st - 2 nd yr) (Old 200134 N311M 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) /		26	No
Physics and Applied Maths / <i>Fisika en Toegepaste Wisk</i>	2FF H24 N301P (1 st - 2 nd yr) (Old/ Ou 200190-N155P 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 5 (60-69%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / <i>Nee</i>
Physics and Applied Maths	2FF H24 N301M (1 st - 2 nd yr) (Old 200152-304M 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%)		26	No

Bachelor of Science / <i>Baccalaureus Scientiae</i> BSc (3 yr / jr)					
WITH Specialisation In / <i>MET Spesialisering in</i>	Programme and Curriculum code / <i>Program- en Kurrikulum-kode</i>	Required Subjects Selection Criteria / <i>Vereiste NSS- Plus Keuringsvereistes</i>	NSC Plus	APS	Selection Test / <i>Keurings-toets</i>
Applied Mathematics and Electronics	2FF H14-N301M (1 st - 2 nd yr) (Old 200171-N303M-3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%)		26	No / <i>Nee</i>
Electronics and Mathematics	2FF H19 N301M (1 st - 2 nd yr) (Old 200179-N309M-3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%)		26	No / <i>Nee</i>
Electronics and Physics	2FF H20 N301M (1 st - 2 nd yr) (Old 200180-N310M-3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%)		26	No / <i>Nee</i>
Physics and Computer Science / <i>Fisika en Rekenaarwetenskap</i>	2FF H25 N301P (1 st - 2 nd yr) (Old/ <i>Ou</i> 200191-N153P - 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 5 (60-69%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / <i>Nee</i>
Physics and Computer Science	2FF H25 N301M (1 st - 2 nd yr) (Old 200132 N128M 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%)		26	No
Chemistry and Computer Science	2FF H31 N301M (1 st - 2 nd yr) (Old 200130-N120M-3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%)		26	No / <i>Nee</i>

Bachelor of Science / Baccalaureus Scientiae BSc (3 yr / jr)					
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- Plus Keuringsvereistes	NSC Plus vakke	APS	Selection Test / Keurings-toets
Computer Science and Electronics	2FF H17 N301M (1 st - 2 nd yr) (Old/Ou 200177-N125M- 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%)		26	No / Nee
Computer Science and Statistics / <i>Rekenaarwetenskap en Statistiek</i>	2FF H26 N301P N301V (1 st - 2 nd yr) (Old/ Ou 200191-N156P; N156V- 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 5 (60-69%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / Nee
Computer Science and Mathematics / <i>Rekenaarwetenskap en Wiskunde</i>	2FF H09 N301P (1 st - 2 nd yr) (Old/ Ou 200191-N157P 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 5 (60-69%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / Nee
Computer Science and Mathematics	2FF H09 N301M (1 st - 2 nd yr) (Old: 200137 N127M 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%)		26	No
Computer Science and Economics / <i>Rekenaarwetenskap en Ekonomie</i>	2FF H28 N301P N301V (1 st - 2 nd yr) (Old/ Ou 200191 N175P;N175V 3 rd yrs only)	Mathematics level 5 (60-69%) / <i>Wiskunde vlak 5 (60-69%)</i>		26	No / Nee

Bachelor of Science / <i>Baccalaureus Scientiae</i> BSc (3 yr / jr)					
WITH Specialisation In / <i>MET Spesialisering in</i>	Programme and Curriculum code / <i>Program- en Kurrikulum-kode</i>	Required Subjects Selection Criteria / <i>Vereiste NSS- Plus Keuringsvereistes</i>	NSC Plus	APS	Selection Test / <i>Keurings-toets</i>
Mathematics and Economy / <i>Wiskunde en Ekonomie</i>	2FF H29 N301P (1 st - 2 nd yr) (Old/ Ou 200191-N176P-3 rd yrs only)	Mathematics level 5 (60-69%) / <i>Wiskunde vlak 5 (60-69%)</i>	5	26	No / <i>Nee</i>
Geography and Applied Mathematics / <i>Geografie en Toegepaste Wiskunde</i>	2FF-H30-N301P (1 st - 2 nd yr) New programme / <i>Nuwe program</i> Offered from 2018 / <i>aangebied vanaf 2018</i>	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 5 (60-69%) en Fisiese Wetenskap vlak 4 (50-59%)</i>	5	26	No / <i>Nee</i>
Tourism-Geography-Zoology / <i>Toerisme-Geografie-Dierkunde</i>	200119 N173P 3 rd yrs only See new programme p40	Phasing out from 2018- only pipeline students. / Faseer uit slegs pyplynstudente		26	No / <i>Nee</i>
Tourism-Geography-Botany / <i>Toerisme-Geografie-Plantkunde</i>	200119 N172P 3 rd yrs only See new programme p40	Phasing out from 2018- only pipeline students. / Faseer uit slegs pyplynstudente		26	No / <i>Nee</i>
Tourism-Zoology-Botany / <i>Toerisme-Dierkunde-Plantkunde</i>	200119 N171P 3 rd yrs only See new programme p40	Phasing out from 2018- only pipeline students. / Faseer uit slegs pyplynstudente		26	No / <i>Nee</i>
Biology and Chemistry	200173 N301M 3 rd yrs only	2018: Phase out: No new intake, only pipeline students.			
Biology and Geography	200174 N301M 3 rd yrs only	2018: Phase out: No new intake, only pipeline students.			

Bachelor of Science in Mathematical Sciences / Baccalaureus Scientiae in Wiskundige Wetenskappe BSc (3 yr / jr)				
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus APS	Selection Test / Keurings- toets
Statistics and Mathematics / <i>Statistiek en Wiskunde</i>	2FG H02 N301P (1 st - 2 nd yr) (Old/ Ou 200191-N158P 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 5 (60-69%) en Fisiese Wetenskap vlak 4 (50-59%)</i>	26	No / Nee
Statistics and Mathematics	200138-N306M 2nd & 3rd yrs	Phasing out from 2018. Mafikeng: no new intake.		
Mathematics / <i>Wiskunde</i>	2FG H01 N301P (1 st - 2 nd yr) (Old/ Ou 200191-N159P 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 5 (60-69%) en Fisiese Wetenskap vlak 4 (50-59%)</i>	26	No / Nee
Applied Mathematics and Mathematics	2FG H03 N301M (1 st - 2 nd yr) (Old 200172-N305M 3 rd yrs only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%)	26	No / Nee

Bachelor of Science in Information Technology / Baccalaureus Scientiae in Inligtingstegnologie BSc (3 yr / jr)					
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- Plus Keuringsvereistes	NSC Plus vakke	APS	Selection Test / Keurings- toets
	<u>Contact/ Kontak</u> 2DX H01 N302P; N302V (1 st - 2 nd yr) (Old/ Ou 2DX H01 N301P; N301V 3 rd yr only) (Old/ Ou 264100- N150P;N150V Pipeline only) <u>Distance/Afstand</u> 2HA H01 - N301P (1 st - 2 nd yr)	Mathematics level 4 (50-59%) / <i>Wiskunde vlak 4</i> (50-59%) 2019: 1 st & 2 nd yrs in Distance Learning only./ <i>Slegs 1^{ste} & 2^{de} jr</i> <i>in Afstandsl eer.</i>	4	26	No / Nee
Bachelor of Science in Biological Sciences / Baccalaureus Scientiae in Biologiese Wetenskappe BSc (3 yr / jr)					
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- Plus Keuringsvereistes	NSC Plus vakke	APS	Selection Test / Keurings- toets
Microbiology and Biochemistry / <i>Mikrobiologie en Biochemie</i>	2DK H11 N301P (1 st - 2 nd yr) (Old/ Ou 200118-N167P 3 rd yrs only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4</i> <i>(50-59%) en Fisiese Wetenskap vlak 4 (50-59%)</i>	4	26	No / Nee
Microbiology and Biochemistry /	2DK H11 N301M (1 st - 2 nd yr) (Old 200118-N167M 3 rd yrs only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%)	4	26	No

**Bachelor of Science in Biological Sciences /
Baccalaureus Scientiae in Biologiese Wetenskappe
BSc (3 yr / jr)**

WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
Zoology and Biochemistry / <i>Dierkunde en Biochemie</i>	2DK H07 N302P (1 st - 2 nd yr) 2DK H07 N301P (3 rd yr) (Old/ Ou 200118-N160P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / Nee
Chemistry and Physiology / <i>Chemie en Fisiologie</i>	2DK H06 N302P (1 st - 2 nd yr) 2DK H06 N301P (3 rd yr) (Old/ Ou 200190 N177P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / Nee
Botany and Biochemistry / <i>Plantkunde en Biochemie</i>	2DK H02 N301M N302P (1 st & 2 nd yr) (1 st - 2 nd yr) 2DK H02 N301P (3 rd yr) (Old/ Ou 200118 N170P- Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		26	No / Nee

**Bachelor of Science in Biological Sciences /
Baccalaureus Scientiae in Biologiese Wetenskappe
BSc (3 yr / jr)**

WITH Specialisation In / MET Spesialiserin g in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- Plus Keuringsvereistes	NSC Plus vakke	APS	Selection Test / Keurings-toets
Microbiology and Botany / <i>Mikrobiologie en Plantkunde</i>	2DK H10 N302P N301M (1 st - 2 nd yr) 2DK H10 N301P (3 rd yr) (Old/ Ou 200118-N169P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		26	No / <i>Nee</i>
Zoology and Botany / <i>Dierkunde en Plantkunde</i>	2DK H09 N301P (Old/ Ou 200118-N164P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		26	No / <i>Nee</i>
Zoology and Microbiology / <i>Dierkunde en Mikrobiologie</i>	2DK H08 N301P (Old/ Ou 200118-N163P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		26	No / <i>Nee</i>
Microbiology and Physiology / <i>Mikrobiologie en Fisiologie</i>	2DK H04 N302P (1 st - 2 nd yr) 2DK H04 N301P (3 rd yr) (Old/ Ou 200118-N186P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		26	No / <i>Nee</i>

Bachelor of Science in Biological Sciences / Baccalaureus Scientiae in Biologiese Wetenskappe BSc (3 yr / jr)				
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus APS	Selection Test / Keurings- toets
Zoology and Physiology / <i>Dierkunde en Fisiologie</i>	2DK H03 N302P (1 st - 2 nd yr) 2DK H03 N301P (3 rd yr) (Old/ Ou 200118-N185P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>	26	No / Nee
Bachelor of Science in Environmental Sciences / Baccalaureus Scientiae in Omgewingswetenskappe BSc (3 yr / jr)				
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus APS	Selection Test / Keurings- toets
Botany and Chemistry / <i>Plantkunde en Chemie</i>	2DJ H03 N302P N301M (1 st - 2 nd yr) 2DJ H03 N301P (3 rd yr) (Old/ Ou 200118-N149P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap vlak 4 (50-59%)</i>	26	No / Nee
Biology and Chemistry	200173 N301M	2018: Phase out: No new intake, only pipeline students.		

**Bachelor of Science in Environmental Sciences /
Baccalaureus Scientiae in Omgewingswetenskappe
BSc (3 yr / jr)**

WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
Microbiology and Chemistry / <i>Mikrobiologie en Chemie</i>	2DJ H10 N301P (1 st - 2 nd yr) (Old/ Ou 200118 N168P 3 rd yr only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / <i>Nee</i>
Microbiology and Chemistry	2DJ H10 N301M (1 st - 2 nd yr) (Old 200118-N168M 3 rd yr only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%)		26	No
Zoology and Chemistry / <i>Dierkunde en Chemie</i>	2DJ H04 N302P (1 st - 2 nd yr) 2DJ H04 N301P (3 rd yr only) (Old/ Ou 200118-N161P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / <i>Nee</i>
Geology and Chemistry / <i>Geologie en Chemie</i>	2DJ H07 N302P (1 st - 2 nd yr) 2DJ H07 N301P (3 rd yr only) (Old/ Ou 200118-N180P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap vlak 4 (50-59%)</i>		26	No / <i>Nee</i>

**Bachelor of Science in Environmental Sciences /
Baccalaureus Scientiae in Omgewingswetenskappe
BSc (3 yr / jr)**

WITH Specialisation In / MET Spesialiseringsin	Programme and Curricular code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
Geology and Geography / <i>Geologie en Geografie</i>	2DJ H01 N302P (1 st - 2 nd yr) 2DJ H01 N301P (3 rd yr only) (Old/ Ou 200118 -N147P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)		26	No / Nee
Geology and Botany / <i>Geologie en Plantkunde</i>	2DJ H02 N301P (Old/ Ou 200118-N148P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)		26	No / Nee
Zoology and Geography / <i>Dierkunde en Geografie</i>	2DJ H05 N302P (1 st - 2 nd yr) 2DJ H05 N301P (3 rd yr only) (Old/ Ou 200118 N162P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)		26	No / Nee
Geography and Botany / <i>Geografie en Plantkunde</i>	2DJ H06 N302P N301M (1 st - 2 nd yr) 2DJ H06 N301P (3 rd yr only) (Old/ Ou 200118-N165P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)		26	No / Nee

**Bachelor of Science in Environmental Sciences /
Baccalaureus Scientiae in Omgewingswetenskappe
BSc (3 yr / jr)**

WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- Plus Keuringsvereistes	NSC Plus vakke	APS	Selection Test / Keurings-toets
Biology and Geography	200174 N301M	Phasing out from 2018. Only pipeline students.			
Zoology and Geology / <i>Dierkunde en Geologie</i>	2DJ H08 N301P (Old/ Ou 200118-N182P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		26	No / Nee
Geology and Microbiology / <i>Geologie en Mikrobiologie</i>	2DJ H09 N301P (Old/ Ou 200118-N181P Pipeline only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		26	No / Nee
Chemistry and Geography	2DJ H18 N301M (1 st - 2 nd yr) (Old 200150-N301M 3 rd yr only)	Mathematics level 5 (60-69%) and Physical Science at level 4 (50-59%)		26	No
Geography and Computer Science <i>Geografie en Rekenaarwetenskap</i>	2DJ H14 N301P (1 st - 2 nd yr) (Old/ Ou 200118 N166P 3 rd yrs only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		26	No / Nee

**Bachelor of Science in Environmental Sciences /
Baccalaureus Scientiae in Omgewingswetenskappe
BSc (3 yr / jr)**

WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
Geography and Computer Science	2DJ H14 N301M (1 st - 2 nd yr) (Old 200178-301M 3 rd yrs only)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%)		26	No
Tourism and Zoology / <i>Toerisme en Dierkunde</i>	2DJ H15 N301P (1 st - 2 nd yr) (See BSc Generic for old programmes)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		26	No / <i>Nee</i>
Tourism and Geography / <i>Toerisme en Geografie</i>	2DJ H16 N301P (1 st - 2 nd yr) (See BSc Generic for old programmes)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		26	No / <i>Nee</i>
Tourism and Botany / <i>Toerisme en Plantkunde</i>	2DJ H17 N301P (1 st - 2 nd yr) (See BSc Generic for old programmes)	Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		26	No / <i>Nee</i>

Bachelor of Science in <i>Financial Mathematics / Baccalaureus Scientiae in Finansiële Wiskunde</i> BSc (3 yr / jr)					
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
	2FS H01 N301P N301V (1 st - 2 nd yr) (Old/ Ou 200167 N135P;N135V 3 rd yrs only)	Mathematics level 6 (70% and higher) <i>Wiskunde vlak 6</i> (70% en hoër)	6	32	No / Nee
Bachelor of Science in Quantitative Risk Management / Baccalaureus Scientiae in Kwantitatiewe Risikobestuur BSc (3 yr / jr)					
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
	2FT H01 N301P N301V (1 st - 2 nd yr) (Old/ Ou 200166 N134P;N134V 3 rd yrs only)	Mathematics level 6 (70% and higher) <i>Wiskunde vlak 6</i> (70% en hoër)	6	32	No / Nee

**Bachelor of Science in Business Analytics /
Baccalaureus Scientiae in Bedryfsanalise
BSc (3 yr / jr)**

WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
Data Mining / Data-ontginning	2FR H01 N301P N301V (1 st - 2 nd yr) (Old/ Ou 200168 N136P;N136V 3 rd yrs only)	Mathematics level 6 (70% and higher) Wiskunde vlak 6 (70% en hoër)	6	32	No / Nee

**Bachelor of Science in Actuarial Science /
Baccalaureus Scientiae in Aktuariële Wetenskap
BSc (3 yr / jr)**

WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
	2FQ H01 N301P (1 st - 2 nd yr) (Old/ Ou 200123- N137P 3 rd yrs only)	Mathematics level 6 (70% and higher) Wiskunde vlak 6 (70% en hoër)	6	32	No / Nee

**Bachelor of Science in Urban and Regional Planning /
Baccalaureus Scientiae in Stads- en Streekbeplanning
BSc (4 yr / jr)**

Big Bang process: 1st – 4th yr students will register for this programme (no pipeline students on old programme) / 1^{ste} – 4^{de} jaar studente sal vir hierdie program registreer (geen pyplynstudente op die ou program).

WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
	2FE K01 N401P (1 st -4 th yrs)	Selection: The deadline for applications is 30 June. Late applications will be considered on merit. Mathematics level 5 (60-69%) / Keuring: Aansoeke sluit 30 Junie, laat aansoeke sal op meriete oorweeg word. Wiskunde vlak 5 (60-69%)		28	Yes / Ja

**Bachelor of Science in Agriculture
BSc (4 yr / jr)**

WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
Agricultural Economics	2FD K01 N401M (1 st - 2 nd yr) (Old 267100-N401M: 3 rd & 4 th yrs)	*English Level 4 *Mathematics Level 4 (50-59%) *Physical Science Level OR Life Sciences Level 4		22	No
Animal Health	267 101 N402M (1 st - 2 nd yr) (Old 267101-N401M 3 rd & 4 th yrs)	*English Level 4 *Mathematics Level 4 *Physical Science Level OR Life Science Level 4 (50-59%)		22	No

Bachelor of Science in Agriculture BSc (4 yr / jr)					
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- vakke Plus Keuringsvereistes	NSC Plus	APS	Selection Test / Keurings-toets
Animal Science	2FD K03 N401M (1 st - 2 nd yr) (Old 267102-N401M 3 rd & 4 th yrs)	*English Level 4 *Mathematics Level 4 *Physical Science Level 4 OR Life Sciences Level 4 (50-59%)		22	No
Agronomy and Horticulture	2FD K04 N401M (1 st - 2 nd yr)	*English Level 4 *Mathematics Level 4 *Physical Science Level 4 OR Life Sciences Level 4 (50-59%)		22	No
Agricultural Economics and Agronomy / Landbou- ekonomie en Agronomie	2FD K05 N401P New/nuut (1 st yr only/ slegs 1 st yr)	English Level 4 Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Engels vlak 4 Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		22	No
Soil Science and Agronomy / Grondkunde en Agronomie	2FD K06 N401P New/nuut (1 st yr only/ slegs 1 st yr)	English Level 4 Mathematics level 4 (50-59%) and Physical Science at level 4 (50-59%) / <i>Engels vlak 4 Wiskunde vlak 4 (50-59%) en Fisiese Wetenskap op vlak 4 (50-59%)</i>		22	No

Crop Science	267103-N401M	Phasing out No new intake for 2018	20	No	
Bachelor of Indigenous Knowledge Systems BSc (4yr / jr)					
WITH Specialisation In / MET Spesialisering in	Programme and Curriculum code / Program- en Kurrikulum-kode	Required Subjects Selection Criteria / Vereiste NSS- Plus Keuringsvereistes	NSC Plus vakke	APS	Selection Test / Keurings- toets
Indigenous Knowledge Systems	287100 N402M	*English level 4 *Matriculation with exemption OR *Recognition of Prior Learning (RPL) OR *GCE certification and an application for conditional exemption with HESA (www.he- enrol.ac.za)		20	No

NAS.1.10.5 TRAINING OF TEACHERS: POSTGRADUATE CERTIFICATE IN EDUCATION (PGCE) / ONDERWYSEROPLEIDING: NAGRAADSE SERTIFIKAAT IN ONDERWYS (NGOS)

The Faculty of Natural and Agricultural Sciences regards the training of teachers to be of such importance that information regarding the Postgraduate Certificate in Education (PGCE) is summarised below for the convenience of prospective teachers. However, students should not neglect consulting the PGCE calendar of the Faculty of Education Sciences for complete information.

Die Fakulteit Natuur- en Landbouwetenskappe beskou onderwysersopleiding so belangrik, dat inligting in verband met die Nagraadse Onderwysertifikaat (NGOS) hieronder kortliks vir die gerief van voornemende onderwysstudente opgesom word. Studente moet egter nie nalaat om die NGOS jaarboek van die Fakulteit Opvoedingswetenskappe vir volledige inligting te raadpleeg nie.

****Please note that if a student wants to do a Postgraduate Certificate in Education (PGCE) with Mathematics as a school subject, MTHS111 and MTHS121 must be taken for further admission to Mathematics at 2nd year level. / *Neem kennis dat indien 'n student 'n Nagraadse Sertifikaat in Onderwys (NGOS) wil doen met Wiskunde as 'n skoolvak, moet MTHS111 en MTHS121 geneem word, vir verdere toelating tot Wiskunde op 2de jaarsvlak.*

The following curricula comply with the entry requirements of the PGCE: / *Die volgende kurrikulums voldoen aan die vereistes vir toelating tot die NGOS:*

Qualification and Curriculum code / Kwalifikasie- en Kurrikulumkode	BSc WITH Specialisation In / MET Spesialisering in	PGCE Field of specialisation NGOS Spesialiteitsvakrigting
2DJ H04 N301P/N302P***	Zoology and Chemistry / <i>Dierkunde en Chemie</i>	Physical Science <i>Fisiese wetenskappe</i> Provided Physics is chosen and then Botany and Physiology at 1st year level for the 2nd Life Sciences subject. / <i>Fisika moet gekies word en dan Plantkunde en Fisiologie op 1ste jaarsvlak vir die 2de skoolvak van Lewenswetenskappe.</i>
2DJ H05 N301P/N302P *	Zoology and Geography / <i>Dierkunde en Geografie</i>	Life Sciences Geography <i>Lewenswetenskappe Geografie</i> Subject to Botany and Physiology to the 1st year level. 1 module History together with Geography, to qualify for the Social sciences part of the subject. / <i>Mits Plantkunde en Fisiologie tot die 1ste jaarsvlak is. 1 module Geskiedenis saam met die Geografie om vir die Sosiale wet deel van vak te kwalifiseer.</i>

2DK H08 N301P *	Zoology and Microbiology / <i>Dierkunde</i> en <i>Mikrobiologie</i>	Life Sciences* <i>Lewenswetenskappe*</i> (LS) Subject to Botany and Physiology to the 1st year level. Short 2nd school subject (PS: chemistry 2 and physics 1) / (LW) <i>Mits Plantkunde en Fisiologie tot 1ste jaarsvlak is. Kort nog 2de skoolvak (FW: chemie 2 en fisika 1)</i>
2DK H09 N301P	Zoology and Botany / <i>Dierkunde</i> en <i>Plantkunde</i>	Life Sciences <i>Lewenswetenskappe</i> Only 1 school subject (LS) short. 2nd school subject (Chemistry 2 and Physics 1) <i>Slegs 1 skoolvak (LW) kort nog 2de skoolvak (Chemie 2 en Fisika 1)</i>
2DJ H06 N301P **	Geography and Botany / <i>Geografie</i> en <i>Plantkunde</i>	Life Sciences Geography <i>Lewenswetenskappe</i> <i>Geografie</i> (LS) Subject to Zoology and Physiology to the 1st year level. Geography, provided that 1 module is history. (LW) <i>mits Dierkunde en Fisiologie tot die 1ste jaarsvlak is. Geografie, mits 1 module geskiedenis is.</i>
2DJ H14 N301P/N301M	Geography and Computer Sciences / <i>Geografie</i> en <i>Rekenaarwetenskap</i>	Geography Information Technology <i>Geografie</i> <i>Inligtingstechnologie</i> IT and Geography, provided that 1 module history is passed for school subject. / <i>IT en geografie, mits 1 module geskiedenis geslaag word vir skoolvak.</i>
2DK H10 N301P/N302P/ N301M **	Microbiology and Botany / <i>Mikrobiologie</i> en <i>Plantkunde</i>	Life Sciences <i>Lewenswetenskappe</i> (LS) If Zoology and Physiology are taken to 1st year level. (PS) Chemistry 2 and Physics 1 for 2nd school subject. / (LW) <i>Mits Dierkunde en Fisiologie tot 1ste jaarsvlak geneem word. (FW) Chemie 2 en Fisika 1 vir 2de skoolvak.</i>
2DJ H03 N301P/N302P/	Botany and Chemistry /	Physical Science <i>Fisiese wetenskappe</i>

N301M ***	<i>Plantkunde en Chemie</i>	(PS) Provided Physics 1 (LS) with Zoology and Physiology until the 1st year. (FW) Mits Fisika 1 en (LS) Dierkunde en Fisiologie tot 1ste jaar.
2FF H05 N301P/N301M	Chemistry and Physics / <i>Chemie en Fisika</i>	Physical Science Mathematics <i>Fisiese wetenskappe</i> <i>Wiskunde</i> (Maths and Physics / <i>Wiskunde en Fisika</i>)
2FF H22 N301P	Chemistry, Mathematics and Applied Mathematics / <i>Chemie, Wiskunde en Toegepaste Wiskunde</i>	Physical Science Mathematics <i>Fisiese wetenskappe</i> <i>Wiskunde</i> (Maths and Physics / <i>Wiskunde en Fisika</i>)
2FF H23 N301P/N301M	Physics and Mathematics / <i>Fisika en Wiskunde</i>	Mathematics <i>Wiskunde</i> (Maths, Physics and Chemistry at level 1 / <i>Wisk, Fisika en Chemie op vlak 1</i>)
2FF H24 N301P/N301M	Physics and Applied Mathematics / <i>Fisika en Toegepaste Wiskunde</i>	Mathematics <i>Wiskunde</i> Maths, PS and Chemistry 1 / <i>Wiskunde, FW en Chemie 1</i>
2FF H06 N301P/N301M	Chemistry and Biochemistry / <i>Chemie en Biochemie</i>	Physical Science <i>Fisiese wetenskappe</i> PS provided physics 1. No 2nd school subject, so will not qualify for PGCE FW: mits fisika 1. Geen 2de skoolvak dus sal nie kwalifiseer vir NGOS
2FF H25 N301P/N301M	Physic and Computer Science / <i>Fisika en Rekenaarwetenskap</i>	Information Technology Mathematics <i>Inligtingstegnologie</i> <i>Wiskunde</i> In order for IT and Math. PS-provided Chemistry 1 <i>Korrek vir IT en Wisk. FW, mits Chemie 1</i>
2FF H26 N301P/N301V	Computer Science and Statistics / <i>Rekenaarwetenskap en Statistiek</i>	Information Technology Mathematics <i>Inligtingstegnologie</i> <i>Wiskunde</i>

		In order for IT and Math. / <i>Korrekt vir IT en Wisk.</i>
2FF H09 N301P/N301M	Computer Science and Mathematics / <i>Rekenaarwetenskap en Wiskunde</i>	Information Technology Mathematics <i>Inligtingstegnologie Wiskunde</i> Maths and IT / <i>Wisk en IT</i>
2FG H02 N301P	Statistics and Mathematics / <i>Statistiek en Wiskunde</i>	Mathematics <i>Wiskunde</i> Maths and IT / <i>Wisk en IT</i>
2FG H01 N301P	Mathematics / <i>Wiskunde</i>	Mathematics <i>Wiskunde</i> / No – short school subject to level 2. / <i>Nee- Kort skoolvak tot vlak 2.</i>
2FF H28 N301P/N301V	Computer Science and Economics / <i>Rekenaarwetenskap en Ekonomie</i>	Information Technology Economics <i>Inligtingstegnologie Ekonomie</i> IT and Mathematics. Economics, provided BMAN111 and ACCS111 / <i>IT en Wiskunde. Ekonomie, mits BMAN111 en ACCS111</i>
2FF H29 N301P	Mathematics and Economics / <i>Wiskunde en Ekonomie</i>	Mathematics Economics <i>Wiskunde ; Ekonomie</i> Mathematics and IT. Economics with BMAN111 and ACCS111/ <i>Wiskunde en IT. Ekonomie mits BMAN111 en ACCS111.</i>

* Only if Botany II is selected. / *Slegs indien Plantkunde II gekies word.*

** Only if Zoology II is selected. / *Slegs indien Dierkunde II gekies word.*

*** Only if Physics I is selected. / *Slegs indien Fisika I gekies word.*

a) **Nature and aims of the PGCE / Die aard en doel van die NGOS**

The PGCE serves as a professional ‘capping’ qualification for candidates who have completed an appropriate 360 or 480 credits Bachelor’s degree and would like to join the education profession. With this certificate an educator can teach from Grade 7 to Grade 12.

Die NGOS dien as ’n verdere professionele kwalifikasie vir kandidate wat ’n 360- of 480 krediet Baccalaureus graad voltooi het en tot die onderwys profession wil toetree. Met hierdie sertifikaat mag ’n onderwyser vanaf Graad 7 tot 12 onderrig.

b) Duration of studies / Duur van studie

The minimum duration of the study is one (1) year and the maximum duration is two (2) years. / *Die minimumduur van die studie is een (1) jaar en 'n maksimum van twee (2) jaar.*

c) Method of delivery / Metode van aflewering

This qualification can be taken only full-time. Contact the Faculty of Education Sciences for more information. / *Hierdie kwalifikasie kan slegs voltyds geneem word. Kontak die Fakulteit Opvoedingswetenskappe vir meer inligting.*

d) Admission requirements / Toelatingsvereistes

A first university degree or relevant qualification of at least 360 credits with two recognised school subjects in that qualification.

'n Eerste universiteitsgraad met twee erkende skoolvakke of 'n erkende kwalifikasie wat in totaal 360 krediete optel en wat minstens twee erkende skoolvakke insluit soos aangedui.

Students must also be able to take two (2) methodologies in order to obtain the PGCE qualification. The curriculum of the certificate must be structured as follows:

Studente moet ook in staat wees om twee (2) metodieke te kan neem ten einde die kwalifikasie te verwerf. Die samestelling in die graadkursus moet die volgende wees:

- Recognised school subject/learning area at level 3 + recognised school subject/learning area at level 2.
- *Erkende skoolvak/leeraarea op vlak 3 + erkende skoolvak/leeraarea op vlak 2.*

Students must enrol for the methodologies of the subject in which he/she obtained the highest qualification.

In geval van 'n keuse tussen metodiek van akademiese vakke reeds geslaag vir 'n vorige kwalifikasie moet die student die twee neem waarin die hoogste gekwalifiseer is.

e) Exceptions / Uitsonderings

A student who wants to take **Life Sciences** as methodology needs to present one of the subjects Botany, Zoology or Physiology at level three and another of these subjects at level 2.

'n Student wat Lewenswetenskappe as metodiek wil neem moet een van die volgende vakke (Plantkunde, Dierkunde of Fisiologie) op vlak 3 en 'n ander op vlak 2 geslaag het.

A student who wants to take **Physical Sciences** as methodology needs to present one of the subjects Chemistry or Physics on level three and the other at level 1 OR both subjects at level 2.

'n Student wat Fisiese wetenskappe as metodiek wil neem moet een van Chemie of Fisika op graadvlak 3 vir toelating tot die NGOS aanbied en die ander ten minste op graadvlak 1. As alternatief kan Chemie en Fisika beide op graadvlak 2 vir toelating aangebied word.

A student who wants to take the Methodology of **Mathematics** must have completed Mathematics on level 2 or otherwise Mathematics on level 1 with one of the following on level 2: Statistics, Mathematical Statistics, Applied Mathematics and Financial Mathematics. (****see also note NAS1.10.5)

*'n Student wat die metodiek van **Wiskunde** wil neem, moet Wiskunde op vlak 2 geslaag het, andersins kan Wiskunde op vlak 1 saam met een van die volgende op vlak 2 aangebied word: Statistiek, Toegepaste Wiskunde, Finansiële Wiskunde. (**** sien ook nota NAS1.10.5)*

A student who wants to take the Methodology of **Life Orientation** must have **Psychology** and one of the following subjects on degree level: Sociology, Political Studies, Human Movement Science, Labour -and Industrial studies, Human Rights and Ethics or Nutrition. The student must also have a second school subject on degree level for the second methodology.

*'n Student wat die Metodiek van **Lewensoriëntering** wil neem, moet **Sielkunde** en een van die volgende vakke op graadvlak geneem het: Sosiologie, Politieke Studies, Menslike Bewegingskunde, Arbeid – en Industriële studies, Menseregte en Etiek of voeding. Die student moet dan steeds ook 'n tweede skoolvak op graadvlak geneem het vir die tweede metodiek.*

A student who wants to take the Methodology of any **language** must have completed that language at level 3.

*'n Student wat die Metodiek van enige **taal** wil neem, moet die betrokke taal ten minste op graadvlak 3 geslaag het*

Students who have as yet not completed their first degree may in rare cases be admitted to the PGCE. Such students should direct applications to the applicable School Director at the Faculty of Education Sciences.

Studente wat nog nie hulle eerste graad voltooi het nie, kan by uitsondering tot die NGOS toegelaat word. Studente moet spesiaal daarvoor aansoek doen by die betrokke Skooldirekteur by Fakulteit Opvoedingswetenskappe.

e) Directed observation / Gerigte waarneming

Before starting the PGCE a student must attend an approved school for preparatory compulsory work related training for at least two weeks.

Studente moet voor die aanvang van die NGOS program minstens twee weke lank 'n verpligte gerigte waarneming by 'n goedgekeurde skool onderneem om werksverwante ervaring te verkry.

NAS.1.11 SCHOOLS, CENTRES OF THE FACULTY / SKOLE EN SENTRUMS IN DIE FAKULTEIT

The Faculty of Natural and Agricultural Sciences consists of six schools and two centres, each of which is made up of different subject groups. At the head of each school/centre is a director and who is assisted by a subject chairperson from each subject group. The school/centre is responsible for teaching graduate, honours and lectured master's programmes. These schools/centres and subjects groups that make up each school are represented in the following table: /

Die Fakulteit Natuur- en Landbouwetenskappe het ses skole en twee sentrums wat elkeen saamgestel is uit verskillende vakgroepe. Aan die hoof van elke skool/sentrum staan 'n direkteur en hy/sy word uit elke vakgroep bygestaan deur 'n vakvoorsitter. Die skole/sentrums is veral verantwoordelik vir onderrig van voorgraadse, honneurs- en gedoseerde Magisterprogramme. Dié skole/sentrums en die vakgroepe waaruit elke skool/sentrum saamgestel is, word in die tabel weergegee:

School & Centre / Skool & Sentrum	Subject Group / Vakgroep
School of Agricultural Sciences / <i>Skool vir Landbouwetenskappe</i>	Agricultural Economics and Extension / <i>Landbou-ekonomie en Voorligting</i> Animal Sciences / <i>Dierewetenskappe</i> Agronomy and Horticulture / <i>Agronomie en Tuinbou</i> Animal Health Science / <i>Dieregesondheidstudies</i> Agriculture with Soil Science and Agronomy / <i>Landbou met Landbou-ekonomie en Agronomie</i> Agriculture with Agricultural Economics and Agronomy / <i>Landbou met Grondkunde en Agronomie</i>
School of Biological Sciences / <i>Skool vir Biologiese Wetenskappe</i>	Botany / <i>Plantkunde</i> Microbiology / <i>Mikrobiologie</i> Zoology / <i>Dierkunde</i>
School of Geo- and Spatial Sciences / <i>Skool vir Geo- en Ruimtelike Wetenskappe</i>	Geography / <i>Geografie</i> Geology / <i>Geologie</i> Urban and Regional Planning / <i>Stads- en Streekbeplanning</i>
School of Computer Science and Information Systems / <i>Skool vir Rekenaarwetenskap en Inligtingstelsels</i>	Computer Science and Information Systems / <i>Rekenaarwetenskap en Inligtingstelsels</i>
School of Mathematical and Statistical Sciences / <i>Skool vir Wiskundige en Statistiese Wetenskappe</i>	Statistics / <i>Statistiek</i> Mathematics and Applied Mathematics / <i>Wiskunde en Toegepaste Wiskunde</i>
School of Physical and Chemical Sciences / <i>Skool vir Fisiese en Chemiese Wetenskappe</i>	Biochemistry / <i>Biochemie</i> Chemistry / <i>Chemie</i> Physics / <i>Fisika</i>
Centre for Business Mathematics and Informatics / <i>Sentrum vir Bedryfswiskunde en Informatika</i>	Actuarial Science / <i>Aktuariële Wetenskap</i> Business Analytics / <i>Bedryfsanalise</i>

NAS.1.12 RE-CURRICULATION OF QUALIFICATIONS AND PROGRAMMES TO ADHERE TO HEQSF REQUIREMENTS / HERKURRIKULERING VAN KWALIFIKASIES EN PROGRAMME OM TE VOLDOEN AAN HEQSF- VEREISTES

Please note that the Faculty has re-curriculated its qualifications and re-linked its programmes over, as managed by the institutional HEQSF-alignment project team. The programmes were HEQSF-aligned during 2016 and 2017 and are included in the 2019 yearbook. Only **first and second year** students will be registered on the new aligned programmes, while senior students will be phasing out on the old programmes, as was registered in 2017/2018. These programmes are also indicated in the yearbook. A table indicating the old qualification-programme, vs new qualification-programme codes is therefore included for purposes of elucidation (NAS.1.13.) /

*Neem asseblief kennis dat die Fakulteit sy kwalifikasies en gekoppelde programme hergekurrikuleer het, soos deur die institusionele HEQSF-belyningsprojekspan bestuur word. Die programme is in 2016 en 2017 deur die HEQSF belyn en is in die 2019 jaarboek ingesluit. Slegs **eerste en tweedejaarstudente** sal vir die nuwe belynde programme registreer, terwyl seniorstudente uitfaseer op die ou program, soos in 2017/2018 geregistreer was. 'n Tabel wat die ou kwalifikasie-program vs nuwe kwalifikasie-programkodes bevat, word daarom ingesluit, met die oog op toeligting (NAS.1.13).*

NAS.1.13 QUALIFICATIONS, PROGRAMMES AND CURRICULA / KWALIFIKASIES, PROGRAMME EN KURRIKULUMS

Different qualifications can be obtained in the Faculty of Natural and Agricultural Sciences. A specific qualification may be obtained in one or more programmes (the term *programme* indicates a specific field of study), and in each programme one or more curricula are available. A prospective student must therefore first decide which qualification he/she wants to obtain. For example, after a student has decided he/she would like to obtain a BSc degree, he has to select a programme, for instance the physical and chemical programme, the computer and mathematical programme or the environmental and biological programme etc. If the student decides on the environmental and biological programme for instance, he/she must then study the different curricula offered in this programme and finally decide on a curriculum. Information and the rules for the different qualifications, programmes and curricula are explained in this Calendar. /

*In die Fakulteit Natuur- en Landbouwetenskappe kan verskillende kwalifikasies verwerf word. 'n Bepaalde kwalifikasie kan in een of meer verskillende programme (die term *program* dui 'n bepaalde studierigting aan) verwerf word en in elke program kan daar weer een of meer kurrikulums beskikbaar wees. 'n Voornemende student moet dus eers 'n kwalifikasie kies om te verwerf. Nadat 'n student byvoorbeeld besluit het op 'n BSc-graad, moet 'n program gekies word, byvoorbeeld die Fisiese en Chemiese-; Rekenaar- en Wiskundige; die Omgewings- of Biologiese program, ensovoorts. As die student op byvoorbeeld die Fisiese en Chemiese program besluit het, is dit dan nodig om die verskillende kurrikulums wat in hierdie program aangebied word, te bestudeer en ten slotte op 'n kurrikulum te besluit. Inligting oor en die reëls vir die verskillende kwalifikasies, programme en kurrikulums word in hierdie Jaarboek uiteengesit.*

NAS.1.13.1 The North-West University is authorised to award the following diplomas/degrees in undergraduate studies in the Faculty of Natural and Agricultural Sciences: /

Die Noordwes-Universiteit is bevoeg om in die Fakulteit Natuur- en Landbouwetenskappe die volgende voorgraadse diplomas/grade toe te ken:

UNIVERSITY DIPLOMAS (3 yr)					
Qualification / Kwalifikasie	Specialisation / Spesialisering	Program code / Program-kode	Mode of delivery / Metode van aflewering	Campus / Kampus	NQF level / NKR vlak
UNIVERSITY DIPLOMA IN ANIMAL HEALTH					
2019: Third and pipeline students will register for the same qualification code, for which they were registered in 2018.					
University Diploma in Animal Health (3 years)		2DY B01 N302M (1st & 2ndyr) N301M (3rdyr) (Old Phasing out 266100-N102M-pipeline only)	Contact	MC	6
UNIVERSITY DIPLOMA IN ANIMAL SCIENCE					
University Diploma in Animal Science (3 years)		2FH B01-N301M (1st & 2ndyr) (Old Phasing out 279100-N101M 3rd yrs only)	Contact	MC	6
UNIVERSITY DIPLOMA IN PLANT SCIENCE WITH					
University Diploma in Plant Science (3 years)	Crop production	2FJ B01-N301M (1st & 2ndyr)	Contact	MC	6
University Diploma in Plant Science (3 years)	Crop Science	Phasing out (279101-N103M 3rd yrs)	Contact	MC	7

BSc Degrees					
Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van aflewering	Campus/ Kampus	NQF level / NKR vlak
Bachelor of Science WITH / Baccalaureus Scientiae MET BSc (3 yr / jr)					
2019: Senior students will register for the same qualification code for which they were registered in 2018. / Senior-studente moet vir dieselfde kwalifikasiekode registreer, waarvoor hulle in 2018 geregistreer was.					
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Chemistry and Physics / <i>Chemie en Fisika</i>	2FF H05 N301P N301M (1 st & 2 nd yr) (Old/ Ou 200190-N151P 200129-N308M 3 rd yrs)	Contact / <i>Kontak</i>	MC/PC MK/PK	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Chemistry, Mathematics and Applied Maths / <i>Chemie, Wiskunde en Toeg.Wisk.</i>	2FF H22-N301P (1 st , 2 nd & 3 rd yrs) (Old/ Ou 200190-N152P pipeline only <i>/slegs pyplyn</i>)	Contact / <i>Kontak</i>	PC/PK	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Applied Mathematics and Chemistry	2FF H13-N301M (1 st & 2 nd yr) (Old 200169-N302M- 3 rd yrs)	Contact /	MC	7
Bachelor of Science	Chemistry and Mathematics	2FF H11-N301M (1 st & 2 nd yr) (Old 200140-N307M- 3 rd yrs)	Contact	MC	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Applied Mathematics and Electronics	2FF H14-N301M (1 st & 2 nd yr) (Old 200171-N303M- 3 rd yrs)	Contact	MC	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level / NKR vlak
Bachelor of Science	Electronics and Mathematics	2FF H19 N301M (1 st & 2 nd yr) (Old 200179-N309M- 3 rd yrs)	Contact	MC	7
Bachelor of Science	Electronics and Physics	2FF H20 N301M (1 st & 2 nd yr) (Old 200180-N310M- 3 rd yrs)	Contact	MC	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Physics and Mathematics / <i>Fisika en Wiskunde</i>	2FF H23 N301P N301M (1 st & 2 nd yr) (Old/ Ou 200190-N154P 200134-N311M- 3 rd yrs)	Contact / <i>Kontak</i>	MC/PC MK/PK	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Physics and Applied Maths / <i>Fisika en Toegepaste Wisk</i>	2FF H24 N301P N301M (1 st & 2 nd yr) (Old/ Ou 200190-N155P 200152-N304M- 3 rd yrs)	Contact / <i>Kontak</i>	MC/PC MK/PK	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Biochemistry and Chemistry / <i>Biochemie en Chemie</i>	2FF H06 N301P N301M (1 st & 2 nd yr) (Old/ Ou 200190-N174P; N174M- 3 rd yrs)	Contact / <i>Kontak</i>	MC/PC MK/PK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level / NKR vlak
Phasing out from 2018. Only pipeline students.	Biology and Chemistry	200173 N301M	Contact	MC	7
Phasing out from 2018. Only pipeline students.	Biology and Geography	200174 N301M	Contact	MC	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Physics and Computer Science / <i>Fisika en Rekenaarweten- skap</i>	2FF H25 N301P N301M (1 st & 2 nd yr) (Old/ Ou 200191-N153P 200132-N128M- 3 rd yrs)	Contact / <i>Kontak</i>	MC/PC MK/PK	7
Bachelor of Science	Chemistry and Computer Science	2FFH31 N301M (1 st & 2 nd yr) (Old 200130-N120M- 3 rd yrs)	Contact	MC	7
Bachelor of Science	Computer Science and Electronics	2FF H17 N301M (1 st & 2 nd yr) (Old/Ou 200177-N125M- 3 rd yrs)	Contact	MC	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Computer Science and Statistics / <i>Rekenaarweten- skap en Statistiek</i>	2FF H26 N301P N301V (1 st & 2 nd yr) (Old/ Ou 200191 N156P; N156V- 3 rd yrs)	Contact / <i>Kontak</i>	VTC/PC VDK/PK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van aflewering	Campus/ Kampus	NQF level / NKR vlak
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Computer Science and Mathematics / <i>Rekenaarwetenskap en Wiskunde</i>	2FF H09 N301P N301M (1 st & 2 nd yr) (Old/ Ou 200191-N157P 200137-N127M- 3 rd yrs)	Contact / <i>Kontak</i>	MC/PC MK/PK	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Computer Science and Economics / <i>Rekenaarwetenskap en Ekonomie</i>	2FF H28 N301P N301V (1 st & 2 nd yr) (Old/ Ou 200191 N175P;N175V 3 rd yrs)	Contact / <i>Kontak</i>	VTC/PC VDK/PK	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Mathematics and Economy / <i>Wiskunde en Ekonomie</i>	2FF H29 N301P (1 st & 2 nd yr) (Old/ Ou 200191-N176P- 3 rd yrs)	Contact / <i>Kontak</i>	PC/PK	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Geography and Applied Mathematics / <i>Geografie en Toegepaste Wiskunde</i>	2FF H30 N301P (1 st & 2 nd yr) New programme offered from 2018. / <i>Nuwe program vanaf 2018 aangebied.</i>	Contact / <i>Kontak</i>	PC/PK	7
See new programmes in Tourism under BSc Environmental Sciences. / Sien nuwe programme in Toerisme onder BSc Omgewingswetenskappe.					
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Tourism - Geography-Zoology/ <i>Toerisme-Geografie-Dierkunde</i>	200119 N173P Phasing out from 2018- pipeline students only.	Contact / <i>Kontak</i>	PC/PK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level / NKR vlak
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Tourism- Geography- Botany / <i>Toerisme- Geografie- Plantkunde</i>	200119 N172P Phasing out from 2018- pipeline students only.	Contact / Kontak	PC/PK	7
Bachelor of Science / <i>Baccalaureus Scientiae</i>	Tourism- Zoology-Botany / <i>Toerisme- Dierkunde- Plantkunde</i>	200119 N171P Phasing out from 2018- pipeline students only.	Contact / Kontak	PC/PK	7
Bachelor of Science in Information Technology / <i>Baccalaureus Scientiae in Inligingstegnologie</i> BSc (3 yr / jr)					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / <i>Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.</i>					
Bachelor of Science in Information Technology (3 year, BSc IT) / <i>Baccalaureus Scientiae in Inligingstegnologie</i> (3 jaar, BSc IT)		<u>Contact/ Kontak</u> 2DX H01 N302P; N302V (1 st & 2 nd yr→) (Old/ Ou 2DX H01 N301P; N301V 3 rd yr→) (Old/ Ou 264100- N150P;N150V pipeline only) <u>Distance/Afstand</u> 2HA H01 - N301P (2018:1 st yr→)	Contact or/of Distance / <i>Afstand</i> (2019 1 st & 2 nd yr only / <i>slegs 1st & 2^{de} jr</i>)	VTC/PC VDK/PK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level / NKR vlak
Bachelor of Science in Mathematical Sciences WITH/ Baccalaureus Scientiae in Wiskundige Wetenskappe MET BSc (3 yr / jr)					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.					
Bachelor of Science in Mathematical Sciences/ Baccalaureus Scientiae in Wiskundige Wetenskappe	Statistics and Mathematics / Statistiek en Wiskunde	2FG H02 N301P (1 st & 2 nd yr) (Old/ Ou 200191-N158P 3 rd yrs)	Contact / Kontak	PC/PK	7
Bachelor of Science in Mathematical Sciences	Statistics and Mathematics	200138- N306M	Phasing out MC pipeline students		
Bachelor of Science in Mathematical Sciences/ Baccalaureus Scientiae in Wiskundige Wetenskappe	Mathematics / Wiskunde	2FG H01 N301P (1 st & 2 nd yr) (Old/ Ou 200191-N 159P 3 rd yrs)	Contact / Kontak	PC/PK	7
Bachelor of Science in Applied Mathematics and Mathematics	Applied Mathematics and Mathematics	2FG H03 N301M (1 st & 2 nd yr) (Old 200172-N305M 3 rd yrs)	Contact	MC	7
Bachelor of Science in Biological Sciences WITH / Baccalaureus Scientiae in Wetenskappe MET BSc (3 yr / jr)					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.					
Bachelor of Science in Biological Sciences / Baccalaureus Scientiae in Biologiese Wetenskappe	Microbiology and Biochemistry / Mikrobiologie en Biochemie	2DK H11 N301P N301M (1 st & 2 nd yr) (Old/ Ou 200118 N167P; N167M 3 rd yrs)	Contact / Kontak	MC/PC MK/PK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialiserings MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level / NKR vlak
Bachelor of Science in Biological Sciences / <i>Baccalaureus Scientiae Biologiese Wetenskappe</i>	Botany and Biochemistry / <i>Plantkunde en Biochemie</i>	2DK H02 N302P N301M (1 st & 2 nd yr) 2DK H02 N301P (3 rd yr→) (Old/ Ou 200118-N170P- pipeline only)	Contact / <i>Kontak</i>	PC/PK MC	7
Bachelor of Science in Biological Sciences / <i>Baccalaureus Scientiae Biologiese Wetenskappe</i>	Zoology and Biochemistry / <i>Dierkunde en Biochemie</i>	2DK H07 N302P (1 st & 2 nd yr) 2DK H07 N301P (3 rd yr→) (Old/ Ou 200118-N160P pipeline only)	Contact / <i>Kontak</i>	PC/PK	7
Bachelor of Science in Biological Sciences / <i>Baccalaureus Scientiae Biologiese Wetenskappe</i>	Chemistry and Physiology / <i>Chemie en Fisiologie</i>	2DK H06 N302P (1 st & 2 nd yr) 2DK H06 N301P (3 rd yr→) (Old/ Ou 200190-N177P pipeline only)	Contact / <i>Kontak</i>	PC/PK	7
Bachelor of Science in Biological Sciences / <i>Baccalaureus Scientiae Biologiese Wetenskappe</i>	Zoology and Physiology / <i>Dierkunde en Fisiologie</i>	2DK H03 N302P (1 st & 2 nd yr) 2DK H03 N301P (3 rd yr→) (Old/ Ou 200118 N185P pipeline only)	Contact / <i>Kontak</i>	PC/PK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level / NKR vlak
Bachelor of Science in Biological Sciences / <i>Baccalaureus Scientiae</i> in <i>Biologiese Wetenskappe</i>	Microbiology and Physiology / <i>Mikrobiologie en Fisiologie</i>	2DK H04 N302P (1 st & 2 nd yr) 2DK H04 N301P (3 rd yr→) (Old/ Ou 200118 N186P pipeline only)	Contact / <i>Kontak</i>	PC/PK	7
Bachelor of Science in Biological Sciences / <i>Baccalaureus Scientiae</i> in <i>Biologiese Wetenskappe</i>	Zoology and Microbiology / <i>Dierkunde en Mikrobiologie</i>	2DK H08 N301P (1 st , 2 nd & 3 rd yr) (Old/ Ou 200118-N163P pipeline only)	Contact / <i>Kontak</i>	PC/PK	7
Bachelor of Science in Biological Sciences / <i>Baccalaureus Scientiae</i> in <i>Biologiese Wetenskappe</i>	Zoology and Botany / <i>Dierkunde en Plantkunde</i>	2DK H09 N301P (1 st , 2 nd & 3 rd yr) (Old/ Ou 200118 N164P pipeline only)	Contact / <i>Kontak</i>	PC/PK	7
Bachelor of Science in Biological Sciences / <i>Baccalaureus Scientiae</i> in <i>Biologiese Wetenskappe</i>	Microbiology and Botany / <i>Mikrobiologie en Plantkunde</i>	2DK H10 N302P N301M (1 st & 2 nd yr) 2DK H10 N301P (3 rd yr) (Old/ Ou 200118 N169P pipeline only)	Contact / <i>Kontak</i>	MC/PC MK/PK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level / NKR vlak
Bachelor of Science in Environmental Sciences WITH / Baccalaureus Scientiae in Omgewingswetenskappe MET BSc (3 yr / jr)					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.					
Bachelor of Science in Environmental Sciences / Baccalaureus Scientiae in Omgewingswetenskappe	Microbiology and Chemistry / Mikrobiologie en Chemie	2DJ H10 N301P N301M (1 st & 2 nd yr) (Old/ Ou 200118 N168P; N168M 3 rd yr)	Contact / Kontak	MC/PC MK/PK	7
Bachelor of Science in Environmental Sciences / Baccalaureus Scientiae in Omgewingswetenskappe	Botany and Chemistry / Plantkunde en Chemie	2DJ H03 N302P N301M (1 st & 2 nd yr) 2DJ H03 N301P (3 rd yr) (Old/ Ou 200118-N149P pipeline only)	Contact / Kontak	MC/PC MK/PK	7
Bachelor of Science in Environmental Sciences / Baccalaureus Scientiae in Omgewingswetenskappe	Zoology and Chemistry / Dierkunde en Chemie	2DJ H04 N302P (1 st & 2 nd yr) 2DJ H04 N301P (3 rd yr) (Old/ Ou 200118-N161P pipeline only)	Contact / Kontak	PC/PK	7
Bachelor of Science in Environmental Sciences / Baccalaureus Scientiae in Omgewingswetenskappe	Geology and Chemistry / Geologie en Chemie	2DJ H07 N302P (1 st & 2 nd yr) 2DJ H07 N301P (3 rd yr →) (Old/ Ou 200118-N180P pipeline only)	Contact / Kontak	PC/PK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level / NKR vlak
Bachelor of Science in Environmental Sciences / <i>Baccalaureus Scientiae in Omgewingsweten- skappe</i>	Geology and Microbiology / <i>Geologie en Mikrobiologie</i>	2DJ H09 N301P (1 st , 2 nd & 3 rd yr) (Old/ Ou 200118-N181P pipeline only)	Contact / Kontak	PC/PK	7
Bachelor of Science in Environmental Sciences / <i>Baccalaureus Scientiae in Omgewingsweten- skappe</i>	Geology and Botany / <i>Geologie en Plantkunde</i>	2DJ H02 N301P (1 st , 2 nd & 3 rd yr) (Old/ Ou 200118-N148P pipeline only)	Contact / Kontak	PC/PK	7
Bachelor of Science in Environmental Sciences / <i>Baccalaureus Scientiae in Omgewingsweten- skappe</i>	Zoology and Geography / <i>Dierkunde en Geografie</i>	2DJ H05 N302P (1 st & 2 nd yr) 2DJ H05 N301P (3 rd yr) (Old/ Ou 200118 N162P pipeline only)	Contact / Kontak	PC/PK	7
Bachelor of Science in Environmental Sciences / <i>Baccalaureus Scientiae in Omgewingsweten- skappe</i>	Geology and Geography / <i>Geologie en Geografie</i>	2DJ H01 N302P (1 st & 2 nd yr) 2DJ H01 N301P (3 rd yr) (Old/ Ou 200118 N147P pipelineonly)	Contact / Kontak	PC/PK	7
Bachelor of Science in Environmental Sciences / <i>Baccalaureus Scientiae in Omgewingsweten- skappe</i>	Geography and Botany / <i>Geografie en Plantkunde</i>	2DJ H06 N302P N301M (1 st & 2 nd yr) 2DJ H06 N301P (3 rd yr) (Old/ Ou 200118-N165P pipeline only)	Contact / Kontak	MC/PC MK/PK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level / NKR vlak
Bachelor of Science in Environmental Sciences / <i>Baccalaureus Scientiae in Omgewingsweten- skappe</i>	Zoology and Geology / <i>Dierkunde en Geologie</i>	2DJ H08 N301P (1 st , 2 nd & 3 rd yr) (Old/ Ou 200118-N182P pipeline only)	Contact / Kontak	PC/PK	7
Bachelor of Science in Environmental Sciences / <i>Baccalaureus Scientiae in Omgewingsweten- skappe</i>	Chemistry and Geography	2DJ H18 N301M (1 st & 2 nd yr) (Old 200150-N301M 3 rd yr only)	Contact	MC	7
Bachelor of Science in Environmental Sciences / <i>Baccalaureus Scientiae in Omgewingsweten- skappe</i>	Geography and Computer Sciences <i>Geografie en Rekenaarweten- skap</i>	2DJ H14 N301P N301M (1 st & 2 nd yr) (Old/ Ou 200118-N166P 200178-N301M 3 rd yrs only)	Contact / Kontak	MC/PC MK/PK	7
Bachelor of Science in Environmental Sciences / <i>Baccalaureus Scientiae in Omgewingsweten- skappe</i>	Tourism and Zoology / <i>Toerisme en Dierkunde</i>	2DJ H15 N301P 1 st & 2 nd yrs only (3rd yrs see BSc old programmes/ 3de jrs sien BSc ou program)	Contact / Kontak	PC/PK	7
Bachelor of Science in Environmental Sciences / <i>Baccalaureus Scientiae in Omgewingsweten- skappe</i>	Tourism and Geography / <i>Toerisme en Geografie</i>	2DJ H16 N301P 1 st & 2 nd yrs only (3rd yrs see BSc old programmes/ 3de jrs sien BSc ou program)	Contact / Kontak	PC/PK	7
Bachelor of Science in Environmental Sciences / <i>Baccalaureus Scientiae in Omgewingsweten- skappe</i>	Tourism and Botany / <i>Toerisme en Plantkunde</i>	2DJ H17 N301P 1 st & 2 nd yrs only (3rd yrs see BSc old programmes/ 3de jrs sien BSc ou program)	Contact / Kontak	PC/PK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level / NKR vlak
Bachelor of Science in Financial Mathematics / Baccalaureus Scientiae in Finansiële Wiskunde BSc (3 yr / jr)					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.					
Bachelor of Science in Financial Mathematics / Baccalaureus Scientiae in Finansiële Wiskunde		2FS H01 N301P N301V (1 st & 2 nd yr) (Old/ Ou 200167 N135P;N135V 3 rd yrs only)	Contact / Kontak	VTC/PC VDK/PK	7
Bachelor of Science in Quantitative Risk Management / Baccalaureus Scientiae in Kwantitatiewe Risikobestuur BSc (3 yr / jr)					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.					
Bachelor of Science in Quantitative Risk Management / Baccalaureus Scientiae in Kwantitatiewe Risikobestuur		2FT H01 N301P N301V (1 st & 2 nd yr) (Old/ Ou 200166 N134P;N134V only 3 rd yrs)	Contact / Kontak	VTC/PC VDK/PK	7
Bachelor of Science in Business Analytics WITH / Baccalaureus Scientiae in Bedryfsanalise MET BSc (3 yr / jr)					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.					
Bachelor of Science in Business Analytics / Baccalaureus Scientiae in Bedryfsanalise	Data Mining / Data-ontginning	2FR H01 N301P N301V (1 st & 2 nd yr) (Old/ Ou 200168 N136P;N136V 3 rd yrs only)	Contact / Kontak	VTC/PC VDK/PK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level/ NKR vlak
Bachelor of Science in Actuarial Science / Baccalaureus Scientiae in Aktuariële Wetenskap BSc (3 yr / jr)					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.					
Bachelor of Science in Actuarial Science / Baccalaureus Scientiae in Aktuariële Wetenskap		2FQ H01 N301P (1 st & 2 nd yr) (Old/ Ou 200123 N137P 3 rd yrs only)	Contact / Kontak	PK /PC	7
Bachelor of Science in Urban and Regional Planning / Baccalaureus Scientiae in Stads- en Streekbeplanning BSc (4 yr / jr)					
Big Bang process: 1 st – 4 th yr students will register on this programme (no pipeline students on old (2017) programme). / 1 st - 4 ^{de} jr studente sal op hierdie program registreer (geen pyplynstudente op die ou (2017) program)					
Bachelor of Science in Urban and Regional Planning / Baccalaureus Scientiae in Stads- en Streekbeplanning		2FE K01 N401P (1 st - 4 th yrs)	Contact / Kontak	PC/PK	8
Bachelor of Science in Agriculture WITH BSc (4 yr)					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018.					
Bachelor of Science in Agriculture	Agricultural Economics	2FD K01 N401M (1 st & 2 nd yr) (Old 267100-N401M: 3 rd & 4 th yrs)	Contact	MC	8
Bachelor of Science in Agriculture in Animal Health		267 101 N402M (1 st & 2 nd yr) (Old 267101-N401M 3 rd & 4 th yrs)	Contact	MC	8

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level/ NKR vlak
Bachelor of Science in Agriculture	Animal Science	2FD K03 N401M (1 st & 2 nd yr) (Old 267102-N401M 3 rd & 4 th yrs)	Contact	MC	8
Bachelor of Science in Agriculture	Agronomy and Horticulture	2FD K04 N401M (1 st yr)	Contact	MC	8
Bachelor of Science in Agriculture	Crop Science	(Old 267103-N401M) PHASING OUT Pipeline only	Contact	MC	8
This 2 new programmes will be offered from 2019. / Hierdie 2 nuwe programme word vanaf 2019 aangebied. (2FD K05 & 2FD K06)					
Bachelor of Science in Agriculture / <i>Baccalaureus Scientiae in Landbou</i>	Agricultural Economics and Agronomy / <i>Landbou- ekonomie en Agronomie</i>	New/nuut (1 st yr only/ slegs 1 st yr) 2FD K05 N401P	Contact / <i>Kontak</i>	PK /PC	8
Bachelor of Science in Agriculture / <i>Baccalaureus Scientiae in Landbou</i>	Soil Science and Agronomy / <i>Grondkunde en Agronomie</i>	New/nuut (1 st yr only/ slegs 1 st yr) 2FD K06 N401P	Contact / <i>Kontak</i>	PK /PC	8
Bachelor of Indigenous Knowledge Systems BSc (4 yr)					
Bachelor of Science in Indigenous Knowledge Systems	Indigenous Knowledge Systems	287100-N402M	Contact	MC	8

BACHELOR OF SCIENCE DEGREES EXTENDED PROGRAMMES – 4 year / Baccalaureus Scientiae Grade Verlengde programme- 4 jaar VTC/VDK					
Qualification / Kwalifikasie BSc	Specialisation / Spesialisering	Program code / Programkode	Mode of delivery / Metode van aflewering	Campus/ Kampus	NQF level/ NKR vlak
Extended Bachelor of Science in Information Technology / Verlengde Baccalaureus Scientiae in Inligtingstechnologie					
Extended Bachelor of Science in Information Technology / <i>Verlengde Baccalaureus Scientiae in Inligtingstechnologie</i>		2XX H01-N301V (1 st - 3 rd yrs) (Old/ Ou 264102-N302V 4 th yrs only)	Contact / <i>Kontak</i>	VTC/VDK	7
Extended Bachelor of Science in Financial Mathematics / Verlengde Baccalaureus Scientiae in Finansiële Wiskunde					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.					
Extended Bachelor of Science in Financial Mathematics / <i>Verlengde Baccalaureus Scientiae in Finansiële Wiskunde</i>		2XS H01-N301V (1 st - 3 rd yrs) (Old/ Ou 200 208 N301V 4 th yrs only)	Contact / <i>Kontak</i>	VTC/VDK	7
Extended Bachelor of Science in Quantitative Risk Management / Verlengde Baccalaureus Scientiae in Kwantitatiewe Risikobestuur					
Extended Bachelor of Science in Quantitative Risk Management / <i>Verlengde Baccalaureus Scientiae in Kwantitatiewe Risikobestuur</i>		2XT H01-N301V (1 st - 3 rd yrs) (Old/ Ou 200 207-N301V 4 th yrs only)	Contact / <i>Kontak</i>	VTC/VDK	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level/ NKR vlak
Extended Bachelor of Science in Business Analytics WITH / Verlengde Baccalaureus Scientiae in Bedryfsanalise MET					
Extended Bachelor of Science in Business Analytics/ <i>Verlengde Baccalaureus Scientiae in Bedryfsanalise</i>	Data Mining / <i>Data-ontginning</i>	2XR H01-N301V (1 st - 3 rd yrs) (Old/ Ou 200 198-N302V 4 th yrs only)	Contact / <i>Kontak</i>	VTC/VDK	7
BACHELOR OF SCIENCE DEGREES EXTENDED PROGRAMMES – 4 years / Baccalaureus Scientiae Grade Verlengde programme- 4 jaar MC/MK					
Extended Bachelor of Science WITH					
Extended Bachelor of Science (Ext. BSc)	Applied Mathematics and Chemistry	2XFH13-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 192-N302M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science (Ext. BSc)	Applied Mathematics and Electronics	2XFH14-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 193-N302M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science (Ext. BSc)	Computer Science and Mathematics	2XFH09-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 162-N303M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science (Ext. BSc)	Chemistry and Computer Science	2XFH31-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 197-N302M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science (Ext. BSc)	Chemistry and Mathematics	2XFH11-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 195-N302M 4 th yrs only)	Contact	MC	7

Qualification / Kwalifikasie BSc	Specialisation / Spesialisering	Program code / Programkode	Mode of delivery / Metode van aflewering	Campus/ Kampus	NQF level/ NKR vlak
Extended Bachelor of Science WITH					
Extended Bachelor of Science (Ext. BSc)	Physics and Applied Mathematics	2XFH24-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 194-N302M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science (Ext. BSc)	Physics and Mathematics	2XFH23-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 164, N303M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science (Ext. BSc)	Biochemistry and Chemistry	2XFH06-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 201-N301M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science (Ext. BSc)	Chemistry and Physics	2XFH05-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 160-N303M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science (Ext. BSc)	Physics and Computer Science	2XFH25-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 200-N302M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science (Ext. BSc)	Computer Science and Electronics	2XFH17-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 161-N303M 4 th yrs only)	Contact	MC	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialisering MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level/ NKR vlak
Extended Bachelor of Science (Ext. BSc)	Electronics and Physics	2XFH20-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 196-N302M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science (Ext. BSc)	Electronics and Mathematics	2XFH19-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 163-N303M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science in Mathematical Sciences WITH					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.					
Extended Bachelor of Science in Mathematical Sciences (Ext. BSc)	Applied Mathematics and Mathematics	2XGH03-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 158-N303M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science in Environmental Sciences WITH					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.					
Extended Bachelor of Science in Environmental Sciences (Ext. BSc)	Botany and Chemistry	2XJH03-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 159 N303M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science (Ext. BSc)	Biology and Chemistry		Phasing out		
Extended Bachelor of Science (Ext. BSc)	Biology and Geography		Phasing out		
Extended Bachelor of Science in Environmental Sciences (Ext. BSc)	Geography and Botany	2XJH06-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 205-N301M 4 th yrs only)	Contact	MC	7

Qualification / Kwalifikasie BSc (3yrs/jre)	Specialisation WITH / Spesialiserings MET	Program code / Programkode	Mode of delivery / Metode van afle- wering	Campus/ Kampus	NQF level/ NKR vlak
Extended Bachelor of Science in Environmental Sciences (Ext. BSc)	Computer Science and Geography	2XJH14-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 206-N301M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science in Environmental Sciences (Ext. BSc)	Microbiology and Chemistry	2XJH10-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 204-N301M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science in Environmental Sciences (Ext. BSc)	Chemistry and Geography	2XJH18-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 203-N301M 4 th yrs only)	Contact	MC	7
Extended Bachelor of Science in Biological Sciences WITH					
Senior students will register in 2019 for the same qualification code for which they were registered in 2018. / Senior-studente moet in 2019 vir dieselfde kwalifikasiekode registreer waarvoor hulle in 2018 geregistreer was.					
Extended Bachelor of Science in Biological Sciences (Ext. BSc)	Microbiology and Biochemistry	2XKH11-N301M (1 st , 2 nd & 3 rd yrs) (Old 200 202-N301M 4 th yrs only)	Contact	MC	7
New Extended programmes will be offered from 2019					
Extended Bachelor of Science in Environmental Sciences (Ext. BSc)	Botany and Biochemistry	2XK H01 – N301M New (1st yr only)	Contact	MC	7
Extended Bachelor of Science in Environmental Sciences (Ext. BSc)	Botany and Microbiology	2XK H02 – N301M New (1st yr only)	Contact	MC	7

NAS.1.14 LIST OF MODULES ALL CAMPUSES/ LYS VAN MODULES ALLE KAMPUSSE

NAS.1.14.1 ABBREVIATION LIST/ AFKORTING LYS

LIST OF MODULES: MAINSTREAM DEGREE PROGRAMMES (ALL CAMPUSES) / LYS VAN MODULES: HOOFSTROOM PROGRAMME (ALLE KAMPUSSE)		
NO	DESCRIPTION / BESKRYWING	ABBREVIATION / AFKORTING
1	Accountancy/ <i>Rekeningkunde</i>	ACC
2	Academic Literacy/ <i>Akademiese Geletterdheid</i>	ALDA
3	Biochemistry/ <i>Biochemie</i>	BIOC
4	Biology (from 2017 onwards, no new intakes will be registered except 1 st Years)/ <i>Biologie</i>	BIOL
5	Business Management/ <i>Ondernemingsbestuur</i>	BUSI
6	Business Mathematics and Informatics/ <i>Bedryfswiskunde en Informatika</i>	BMI
7	Chemistry/ <i>Chemie</i>	CHEM
8	Zoology/ <i>Dierkunde</i>	ZOO
9	Economics/ <i>Ekonomie</i>	ECON
10	Economics: Risk Management/ <i>Ekonomie: Riskikobestuur</i>	RISK
11	Financial Management/ <i>Finansiële Bestuur</i>	FIN
12	Physics/ <i>Fisika</i>	FIS
13	Physiology/ <i>Fisiologie</i>	PHYS
14	Geography/ <i>Geografie</i>	GEOG
15	Geology/ <i>Geologie</i>	GEOL
16	Soil Science/ <i>Grondkunde</i>	SOIL
17	Computer Science and Information Systems / <i>Rekenaarwetenskap en Inligtingstelsels</i>	COMP
18	Microbiology/ <i>Mikrobiologie</i>	MICRO
19	Botany/ <i>Plantkunde</i>	BOT
20	Urban and Regional Planning/ <i>Stads- en Streeksbeplanning</i> – Prerequisites are unique, dealt within Faculty	URB
21	Statistics/ <i>Statistiek</i>	STATS
22	Applied Mathematics/ <i>Toegepaste Wiskunde</i>	APMath
23	Tourism/ <i>Toerisme</i>	TOUR
24	Mathematics/ <i>Wiskunde</i>	MATH
25	Understand the Economic and Natural Worlds/ <i>Verstaan die Natuurlike en Ekonomiese Wêreld</i>	ETH

NAS.1.14.2 LIST OF ALL MODULES ALL CAMPUSES / LYS VAN ALLE MODULES ALLE KAMPUSSE

NAS.1.14.2.1 Contact/campus students:

When a first semester module in a particular year level is set in the faculty rules as assumed learning for a second semester module, a module mark of at least 40% must be achieved in the first semester module concerned, before the student may continue with the second semester module, provided that they have at least qualify for admission to the examination.

NAS.1.14.2.2 BSC IT programme: Distance learning students:

When a first semester module in a particular year level is set in the faulty rules as assumed learning for a second semester module, students may continue with the second semester, provided that they have at least qualify for admission to the examination.

LIST OF DIPLOMA, MAIN & EXTENDED MODULES – ALL CAMPUSES LYS VAN DIPLOMA, HOOFSTROOM EN VERLENGDE MODULES – ALLE KAMPUSSE								
							ALIGNED? / BELYN?	
MODULE CODE / KODE 2019 →	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUI- SITES / VOORVER- EISTES	CR KR	PRO- GRAM	PC PK	VT C/ V D K	MC MK
Financial Accounting / Finansiële Rekeningkunde								
	ACCC111	Accounting: Frame- work, Foundations, Cycle and Financial Reporting / <i>Rekening- kunde: Raamwerk, Grondslae, Siklus en Finansiële Verslagdoening</i>	Mathematics gr 12 level 5 (60- 69%) / <i>Wiskunde gr 12 vlak 5 (60- 69%)</i>	16	ACC	X	X	
	ACCC121	Accounting for different entity forms / <i>Rekeningkunde vir verskillende entiteitsvorme</i>	ACCC111 (50%) or ACCF111 (65%)	16	ACC	X	X	
ACCF111	ACCF111	Financial Accounting: Basic Concepts, Accounting Systems and Elementary Financial Reporting / <i>Finansiële Rekening- kunde: basiese konsepte, rekening- kundige stelsels en elementêre finansiële verslagdoening</i>	Mathematics gr 12 level 4 (50-59%) / <i>Wiskunde gr 12 vlak 4 (50-59%)</i>	16	ACC	X	X	
ACCF121	ACCF121	Financial Accounting: Elementary Financial	ACCF111 (40%) or	16	ACC	X	X	

		Reporting, Partnerships, and Companies / <i>Finansiële rekeningkunde: elementêre finansiële verslagdoening, vennootskappe, en maatskappye</i>	ACCC111 (40%)					
MODULE CODE / KODE 2019 →	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	MC MK
Financial Accounting (Special) / <i>Finansiële Rekeningkunde (Spesiaal)</i>								
ACCS111	ACCS111	Financial Accounting (Special) – Basic Concepts, Accounting Cycle and Accounting Systems / <i>Finansiële rekeningkunde (spesiaal) – basiese konsepte, Rekeningkundige siklus en rekeningkundige stelsels</i>	Mathematics Grade 12 level 3 (40-49%)	16	ACC	X	X	
ACCS121	ACCS121	Financial Accounting (Special) – Bank Reconciliation, Elementary Financial Reporting and Analysis and Interpretation of Elementary Financial Statements / <i>Finansiële rekeningkunde (spesiaal) - Bankrekonsiliasies, elementêre finansiële verslagdoening, elementêre ontleding en vertolking van finansiële state</i>	ACCS111 (40%)	16	ACC	X	X	
ACFS111	ACFS111	Financial Accounting Special / <i>Finansiële Rekeningkunde Spesiaal</i>		16	Ext Prog VTC		X	
ACFS121	ACFS121	Financial Accounting Special/ <i>Finansiële Rekeningkunde Spesiaal</i>	ACFS111	16	Ext Prog VTC		X	

MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	MC MK
Agricultural / Landbou								
AECM111	AECM111	Introduction to Agricultural Economics	NONE	12	Agric Econ 4yr MC			X
AECM221	AECM221	Land Reform and Agricultural Development	NONE	8	Agric Econ 4yr MC			X
AECM223	AECM223	Farm Accounting	NONE	8	Agric Econ 4yr MC			X
AECM311	AECM311	Agricultural Micro-Economics	AECM 111	16	Agric Econ 4yr MC			X
	AECM312	International Agricultural Trade	AECM 111	8	Agric Econ 4yr MC			X
AECM313	AECM313	Agricultural Statistics for Research I	ANSM 121	16	Agric Econ 4yr MC			X
AECM314	AECM314	Farm Management and Accounting	AECM 111	8	Agric Econ 4yr MC			X
AECM315	AECM315	Food Security Analysis	AECM 111	8	Agric Econ 4yr MC			X
AECM316		Agricultural Production Economics		16	Agric Econ			X
AECM321	AECM321	Land Resource and Environmental Economics	AECM 111	16	Agric Econ 4yr MC			X

MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	M C M K
AECM322	AECM322	Agricultural Production Economics	AECM 111 & AECM 311	16	Agric Econ 4yr MC			X
	AECM323	Agricultural Marketing	AECM 314	8	Agric Econ 4yr MC			X
AECM325	AECM325	Agricultural Macro-Economics	AECM 111 & AECM 311 (40%)	8	Agric Econ 4yr MC			X
AECM326	AECM326	Agricultural Finance	AECM 314 (40%)	8	Agric Econ 4yr MC			X
AECM411	AECM411	Agricultural Project Appraisal and Management	AECM 314	8	Agric Econ 4yr MC			X
AECM412	AECM412	Research Project and Seminar I		16	Agric Econ 4yr MC			X
AECM413	AECM413	Quantitative Methods in Agricultural Economics	AECM 311 & AECM 325	16	Agric Econ 4yr MC			X
AECM414	AECM414	Agricultural Statistics for Research II	AECM 313	16	Agric Econ 4yr MC			X
AECM415	AECM415	Agribusiness Management	AECM 314	16	Agric Econ 4yr MC			X
AECM421	AECM421	Farm Planning and Linear Programming	AECM 314	8	Agric Econ 4yr MC			X

MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	M C M K
AECM422	AECM422	Agricultural Policy Analysis	NONE	16	Agric Econ 4yr MC			X
AECM424	AECM424	Agriculture and Economic Development	AECM 221 & AECM 311	8	Agric Econ 4yr MC			X
AECM425	AECM425	Research Project and Seminar II		16	Agric Econ 4yr MC			X
AECP121 (2020)		Farm Record Keeping and Finance / <i>Plaasrekordhouding en Finansies</i>		16	Agric Econ & Agro 4jr PC	X		
AECP211 (2020)		Farm management and Planning / <i>Landboubestuur en beplanning</i>		16	Agric Econ & Agro 4jr PC	X		
AECP223 (2020)		Agricultural Marketing / <i>Landboubemarking</i>		16	Agric Econ & Agro 4jr PC	X		
AECP311 (2020)		Agribusiness Management / <i>Agribesigheidbestuur</i>		16	Agric Econ & Agro 4jr PC	X		
AECP321 (2020)		Land resource and Environmental Economics / <i>Hulpbron- en Omgewingseconomie</i>		16	Agric Econ & Agro 4jr PC	X		
AECP322 (2020)		Agricultural Production Economics / <i>Landbou Produksie Ekonomie</i>		16	Agric Econ & Agro 4jr PC	X		

MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	M C M K
AEDM111	AEDM111	Introduction to Agricultural Economics	NONE	12	Agric Econ 4yr MC			X
AEDM314	AEDM314	Farm Management and Accounting	AEDM 111	8	Agric Econ 4yr MC			X
AEXM211	AEXM211	Fundamentals of Agricultural Extension	NONE	16	Agric Econ 4yr MC			X
AEXM212	AEXM212	Communication and Technology Transfer	AEXM 211	8	Agric Econ 4yr MC			X
AEXM222	AEXM222	Agricultural Extension for Development	NONE	8	Agric Econ 4yr MC			X
AEXM324	AEXM324	Agricultural Rural Sociology	AEXM 211 & AEXM 222	8	Agric Econ 4yr MC			X
Academic Literacy / Akademiese Geletterdheid								
ALDE111/ ALDA111	AGLE111/ AGLA111	Introduction to Academic Literacy / <i>Inleiding tot Akademiese Geletterdheid</i>		12	ALDA	X	X	X
ALDE122 / ALDA122	AGLE122 / AGLA122	Academic Literacy / <i>Akademiese Geletterdheid</i>	ALDE111 / ALDA111(40%) (=AGLA/E 111)	12	ALDA	X	X	X
Animal Health / Animal Science								
AHBM321	AHBM321	Research Methodology	AHPM 312	8	Animal Health 4yr MC			X
AHDM316 (2020)		Meat Inspection I	AHVM111, 112, 122,121 213, 221, 212, 225	8	Animal Health Dip MC			X
AHDM317 (2020)		Veterinary Jurisprudence	AHVM111, 122,121 213, 221, 212, 225	8	Animal Health Dip MC			X
AHDM326 (2020)		Meat Inspection II	AHVM111, 112, 122,121 213, 221, 212, 225	8	Animal Health Dip MC			X

MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	M C M K
Animal Health / Animal Science								
AHPM212	AHPM212	Anatomy and Physiology I	None	16	Animal Health 4yr MC			X
AHPM213	AHPM213	Veterinary Microbiology	None	16	Animal Health 4yr MC			X
AHPM214		Anatomy and Physiology: Animal Health T I		12	Animal Health 4yr MC			X
	AHPM215	Introduction to game and Wildlife Care		12	Animal Health 4yr MC			X
AHPM216	AHPM216	Animal welfare, Handling and equipment I	None	12	Animal Health 4yr MC			X
	AHPM221	Anatomy and Physiology II	None	8	Animal Health 4yr MC			X
AHPM223	AHPM223	Animal welfare, Handling and equipment II	AHPM212 (40%)	12	Animal Health 4yr MC			X
AHPM224		Anatomy and Physiology: Animal Health II		12	Animal Health 4yr MC			X
AHPM225		Animal Welfare, Handling and Equipments II		12	Animal Health 4yr MC			X
AHPM311	AHPM311	Diseases I	AHPM211	16	Animal Health 4yr MC			X
	AHPM312	Epidemiology	AHPM211	8	Animal Health 4yr MC			X
AHPM313	AHPM313	Obstetrics and Genital Diseases: Animal Health	AHPM212, 221,	16	Animal Health 4yr MC			X
AHPM315		Public Health for Animal Health I		8	Animal Health 4yr MC			X
AHPM317	AHPM317	Pathology I	AHPM212, 211, 212, 221,222	8	Animal Health 4yr MC			X

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AHPM318	AHPM318	Introduction to game and wildlife	AHPM 222	12	Animal Health			X
AHPM319		Epidemiology for Animal Health Technicians		8	Animal Health 4yr MC			X
AHPM321	AHPM321	Diseases II	AHPM211	16	Animal Health 4yr MC			X
AHPM322	AHPM322	Parasitology: Animal Health	AHPM311	16	Animal Health 4yr MC			X
AHPM323	AHPM323	Pharmacology and Toxicology: Animal Health	AHPM212, 221, AHPM311 (40%)	16	Animal Health 4yr MC			X
	AHPM324	Veterinary Public Health I	AHPM212, 221, AHPM311 (40%)	8	Animal Health 4yr MC			X
AHPM325	AHPM325	Clinical Laboratory Techniques	AHPM 211	8	Animal Health 4yr MC			X
	AHPM326	Livestock Diseases	AHPM211 (Animal Science)	8	Animal Health 4yr MC			X
	AHPM326	Livestock Diseases	AHPM 211 (Animal Science)	8	Animal Health 4yr MC			X
AHPM327	AHPM327	Veterinary Jurisprudence	AHPM311	8	Animal Health 4yr MC			X
AHPM329	AHPM329	Pathology II	AHPM221, 211, 212, 221,222, AHPM 313,317, 314 (40%)	8	Animal Health 4yr MC			X
AHPM411	AHPM411	Companion Animal Clinical Care I	AHPM211, 212, 221,222, 313, 323, 314, 325	16	Animal Health 4yr MC			X
AHPM412	AHPM412	Production Animal Clinical Care I	AHPM211, 212, 221,222, 313, 323, 314, 325	16	Animal Health 4yr MC			X
	AHPM414	Practical learning and Experiential Learning I	AHPM221, 211, 212, 221,222, 313,323,314, 325	8	Animal Health 4yr MC			X

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AHPM415	AHPM415	Research Project and Seminar	None	16	Animal Health 4yr MC			X
AHPM 416 (2021)		Public Health for AHT II		8	Animal Health			X
AHPM 417 (2021)		Work Integrated Learning		8	Animal Health			X
AHPM 421	AHPM 421	Companion Animal Clinical Care II	AHPM 211, 212, 221,222, 313, 323, 314, 325, AHPM411(40%)	16	Animal Health 4yr MC			X
AHPM 422	AHPM 422	Production Animal Clinical Care II	AHPM 211, 212, 221,222, 313, 323, 314, 325	16	Animal Health 4yr MC			X
AHPM 424	AHPM 424	Practical learning and Experiential Learning II	AHPM 221, 211, 212, 221,222, 313, 323, 314, 325	8	Animal Health 4yr MC			X
AHPM425	AHPM425	Research Project and Seminar	AHPM415(40%)	16	Animal Health 4yr MC			X
AHPM 426	AHPM 426	Scheduled Diseases	AHPM 311/ AHPM 321	8	Animal Health 4yr MC			X
AHPM 427 (2021)		Work Integrated Learning		8	Animal Health			X
AHVM111	AHVM111	Anatomy and Physiology : Animal Health 1	None	12	Animal Health Dip MC			X
AHVM112	AHVM112	Animal Handling and equipment I	None	8	Animal Health Dip MC			X
AHVM121	AHVM121	Basic Microbiology for Animal Health	None	12	Animal Health Dip MC			X
AHVM122	AHVM122	Anatomy and Physiology : Animal Health 11	AHVM 111	12	Animal Health Dip MC			X

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Animal Health								
AHVM123	AHVM123	Animal Handling and equipment II	AHVM 111, 112 (40%)	8	Animal Health Dip MC			X
AHVM 212	AHVM 212	Parasitology for Animal Health	AHVM 111, 122, 213	8	Animal Health Dip MC			X
AHVM211	AHVM211	Diseases I		16	Animal Health Dip MC			X
AHVM213	AHVM213	Diseases I	AHVM 111, 122,121	12	Animal Health Dip MC			X
AHVM214	AHVM214	Pathology I	AHVM 111, 122,121	8	Animal Health Dip MC			X
	AHVM221	Diseases II	AHVM 213, 111,122, 121	16	Animal Health Dip MC			X
AHVM222	AHVM222	Obstetrics and Genital Diseases: Animal Health	AHVM 111, 122, 213 (40%)	16	Animal Health Dip MC			X
AHVM223	AHVM223	Pharmacology and Toxicology: Animal health	AHVM 111, 122, 213(40%)	16	Animal Health Dip MC			X
AHVM224	AHVM224	Public Health for Animal Health		8	Animal Health Dip MC			X
AHVM225	AHVM225	Clinical Laboratory Techniques	AHVM 111, 122,121 213, 212 (40%)	8	Animal Health Dip MC			X
	AHVM226	Basic Microbiology (Animal Science)	AHVM 121	16	Animal Health Dip MC			X
	AHVM227	Disease II		12	Animal Health Dip MC			X
AHVM228	AHVM228	Pathology II	AHVM 111, 122,121 213, 214(40%)	8	Animal Health Dip MC			X

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Animal Health								
	AHVM311	Companion Animal clinical Care I	AHVM 111, 112, 122,121 213, 221, 212, 225	16	Animal Health Dip MC			X
	AHVM312	Production Animal clinical care I	AHVM 111, 112, 122,121 213, 221, 212, 225	16	Animal Health Dip MC			X
	AHVM313	Pathology I		8	Animal Health Dip MC			X
	AHVM315	Practical learning and Experiential Learning I	AHVM 111, 122,121 213, 221, 212, 225	8	Animal Health Dip MC			X
AHVM316	AHVM316	Companion Animal Clinical Care for AHT 1		12	Animal Health			X
AHVM317	AHVM317	Production Animal Clinical Care for AHT I		12	Dip MC			X
AHVM318	AHVM318	Epidemiology	AHVM 111, 122,121 213, 221, 212, 225	8	Animal Health Dip MC			X
AHVM319	AHVM319	Practical Experiential Learning I		12	Animal Health Dip MC			X
	AHVM321	Companion Animal Clinical care II	AHVM 111, 112, 122,121 213, 221, 212, 225	16	Animal Health Dip MC			X
	AHVM322 (AHVM327 =new)	Production Animal clinical care II	AHVM 111, 122,121 213, 221, 212, 223, 312(40%)	16	Animal Health Dip MC			X
	AHVM323	Pathology II		8	Animal Health Dip MC			X
AHVM324	AHVM324	Scheduled Diseases	AHVM 111, 122,121 213, 221, 212, 225	8	Animal Health Dip MC			X
	AHVM325	Practical learning and Experiential Learning II	111, 122,121 213, 221, 212, 225	8	Animal Health Dip MC			X

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Animal Health (Dipl)								
AHVM326	AHVM328	Companion Animal Clinical Care for AHT II		12	Animal Health			X
AHVM327	AHVM328	Production Animal Clinical Care for AHT II		12	Animal Health			X
AHVM328	AHVM328	Practical Experiential Learning II		12	Animal Health			X
Animal Science (Dipl)								
ANDM121	ANDM121	Introduction to Animal Science	None	12	Animal Scien Dip MC			X
	ANDM122	Non – Ruminant Production	None	8	Animal Scien Dip MC			X
ANDM211	ANDM211	Animal Nutrition	ANDM 121	16	Animal Scien Dip MC			X
ANDM212	ANDM212	Animal Genetics and Breeding	None	8	Animal Scien Dip MC			X
	ANDM213	Ruminant Animal Production	None	8	Animal Scien Dip MC			X
ANDM221	ANDM221	Small Stock Production and Management	ANDM 121	16	Animal Scien Dip MC			X
ANDM223	ANDM223	Beef Production and Management	ANDM 121	16	Animal Scien Dip MC			X
ANDM225	ANDM225	Principles of Veld Management	None	16	Animal Scien Dip MC			X
ANDM226		Grazing Management		16	Animal Scien Dip MC			X
ANDM312	ANDM312	Poultry Production and Management	ANDM 121	16	Animal Scien Dip MC			X

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ANDM313	ANDM313	Dairy Production and Management	ANDM 121	16	Animal Scien Dip MC			X
ANDM314	ANDM314	Pig Production and Management	ANDM 121	16	Animal Scien Dip MC			X
ANDM321	ANDM321	Practical Animal Production	ANDM 121, ANDM 221, ANDM 223, ANDM312(40%) ANDM 313 and ANDM314(40%)	56	Animal Scien Dip MC			X
Animal Science & Health (Degree)								
ANSM121	ANSM121	Introduction to Agricultural Biometry	None	12	Animal Scien 4yr MC			X
ANSM211	ANSM211	Introduction to Animal Science	None	16	Animal Scien 4yr MC			X
ANSM214	ANSM214	Ruminant Production Science	None	8	Animal Health 4yr MC			X
ANSM222	ANSM222	Animal Breeding and Genetics	None	8	Animal Scien 4yr MC			X
ANSM223	ANSM223	Animal Nutrition	None	16	Animal Scien 4yr MC			X
ANSM224	ANSM224	Non-Ruminant Production		8	Animal Health			X
ANSM226		Animal Breeding and Genetics		12	Animal Health			X
	ANSM225	Non – Ruminant Production Science	None	8	Animal Scien 4yr MC			X
ANSM311	ANSM311	Principles of Veld Management	None	16	Animal Scien 4yr MC			X
ANSM312	ANSM312	Applied Agricultural Biometry	ANSM121	16	Animal Scien 4yr MC			X
ANSM313	ANSM313	Agricultural Biochemistry	MCHE114 & MCHE123	8	Animal Scien 4yr MC			X

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ANSM314	ANSM314	Physiology of Reproduction and Growth	AHPM212 & AHPM221	16	Animal Scien 4yr MC			X
ANSM321	ANSM321	Applied Ruminant Nutrition	ANSM 223	16	Animal Scien 4yr MC			X
ANSM322	ANSM322	Planted pastures and Fodder crops	None	8	Animal Scien 4yr MC			X
ANSM323	ANSM323	Quantitative Genetics	ANSM 222	16	Animal Scien 4yr MC			X
ANSM324 (2019)	ANSM324 (2019)	Smallstock Production and Science		16	Animal Scien 4yr MC			X
ANSM326 (2020)		Small Ruminants Production Science	ANSM211(40%)	12	Animal Scien 4yr MC			X
	ANSM411	Applied Monogastric Nutrition		16	Animal Scien 4yr MC			X
	ANSM412	Applied Animal Breeding	ANSM 323	16	Animal Scien 4yr MC			X
	ANSM413	Research Project and Seminar I		16	Animal Scien 4yr MC			X
	ANSM414	Large Stock Production and Science		8	Animal Scien 4yr MC			X
ANSM415 (2021)		Beef Production Science	ANSM 211	12	Animal Scien 4yr MC			X
ANSM416 (2021)		Applied Non-ruminant nutrition	ANSM 223	16	Animal Scien 4yr MC			X
	ANSM422	Pig Science		16	Animal Scien 4yr MC			X
	ANSM423	Practical Experience	None	8	Animal Scien 4yr MC			X

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Animal Science & Health (Degree)								
	ANSM424	Poultry Science		16	Animal Scien 4yr MC			X
	ANSM425	Dairy and Meat Sciences		16	Animal Scien 4yr MC			X
ANSM426 (2021)		Pig Production Science	ANSM211	12	Animal Scien 4yr MC			X
Animal Science & Health (Degree)								
ANSM427 (2021)		Poultry Production Science	ANSM211	12	Animal Scien 4yr MC			X
ANSM428 (2021)		Dairy Production Sciences	ANSCM 313 and ANSM314	12	Animal Scien 4yr MC			X
ANSM479 (2021)		Research Project	none	32	Animal Scien 4yr MC			X
Agriculture								
AXDM211	AXDM211	Fundamentals of Agricultural Extension	NONE	16	Agric Econ MC			X
Applied Mathematics / Toegepaste Wiskunde PC old code =TGWN								
APPM111	APMM117	Introduction to Mechanics	Matric Maths Level 5	12	APMath			X
APPM171	APPM171	Introduction to Mechanics	NONE	12	Ext Prog MC			X
APPM121	TGWN121 (BEng)	Statistics and Mathematical Modelling/ <i>Statika en Wiskundige Modelling</i>	MTHS111(40%)	12	APMath	X		
APPM122	TGWN122 (BSc)/ APMM127	Mathematical Modelling and Vector Algebra/ <i>Wiskundige Modelling en Vektroalgebra</i>	MTHS111(40%)	12	APMath	X		X

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APPM172	APPM172	Mathematical Modelling and Vector Algebra	APPM 171	12	Ext Prog MC			X
APPM211	TGWN211	Dynamics I / <i>Dinamika I</i>	WISN121 & TGWN121 or TGWN122 / MTHS121 & APPM121 or APPM122	8	APMath	X		
APPM212	TGWN213 / Part of APMM217	Differential Equations/ <i>Differensiaalvergelijkinge</i>	WISN121/ MTHS121	8	APMath	X		X
APPM213	Part of APMM227	Linear Programming / <i>Liniêre Programmering</i>	MTHS121 & APPM111 or APPM122	8	APMath			X
Applied Mathematics / Toegepaste Wiskunde PC old code=TGWN								
	APMM 217 (replaced by APPM212 & APPM222)	Mathematical Modelling	All first year modules in Mathematics and Applied Mathematics	16	APMath			
APPM221	TGWN221	Dynamics II/ <i>Dinamika II</i>	TGWN(212)213 (40%)& TGWN121 TGWN122/ APPM212(40%) & APPM121 or APPM122	8	APMath	X		
APPM222	TGWN223 / Part of APMM217	Numerical Analysis/ <i>Numeriese Analise</i>	WISN121/ MTHS121	8	APMath	X	X	X
APPM223	Part of APMM227	Mathematical Methods	MTHS211, MTHS212(40%) & one of APPM212 or APPM 213(40%)	8	APMath			X

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	APMM 227 (Replaced by APPM213 & APPM223)	Differential Equations and Numerical Methods	All first year modules in Mathematics and Applied Mathematics	16	APMath			X
APPM311 (2020)	TGWN311 / APMM318	Partial Differential Equations/ <i>Parsiële Differentiaal-vergelykings</i>	WISN225 or WISN224 (221)/ MTHS221 or MTHS223 and APPM212	16	APMath	X		X
	APMM317	Mathematical Programming	All second year modules in Mathematics and Applied Mathematics	16	APMath			X
APPM312 (2020)	TGWN312	Partial Differential Equations (Numerical)/ <i>Parsiële Differentiaal-vergelykings (Numeries)</i> Numerical methods for Partial Differential Equations/ <i>Numeriese Metodes vir Parsiële Differentiaal-vergelykings</i>	WISN225 or WISN224 (221)/ MTHS221 or MTHS223	16	APMath	X		
APPM313 (2020)	APMM328	Numerical Analysis	APPM222, MTHS211 & MTHS212	16	APMath			X
	TGWN321 (2018)	Dynamics III/ <i>Dinamika III</i> (replace by Dynamical Systems)	TGWN211/ APPM211	16	APMath	X		
APPM321 (2020)		Dynamical Systems/ <i>Dinamiese Stelsels</i>	APPM212, MTHS211, MTHS222/4	16	APMath	X		
TGWN323 (2019)		Dynamical Systems / <i>Dinamiese Stelsels (=APPM321)</i>		16	APMath	X		

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APPM322 (2020)	TGWN322 / APMM317	Optimisation/ <i>Optimalisering</i>	WISN211/ MTHS211 WISN212/ MTHS212 And one of the following: APPM213 APPM211 MTHS224	16	APMath	X		X
	APMM318	Differential Equations and their Applications	All second year modules in Mathematics and Applied Mathematics	16	APMath			
APPM323 (2020)	APMM327	Fluid Mechanics / <i>Vloeimeganika</i>	One of APPM212 or APPM223, And one of MTHS221 or MTHS223, and one of MTHS222 or MTHS224	16		X		X
	APMM327	Fluid Mechanics	All second year modules in Mathematics and Applied Mathematics	16	APMath			X
	APMM328	Introduction to Mechanics	All second year modules in Mathematics and Applied Mathematics	16	APMath			X

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Biochemistry / Biochemie PC & MC new codes								
BCHN213	BCHN213	Introductory Biochemistry / <i>Inleidende Biochemie</i>	NCHE/CHEM111 NCHE/CHEM121 MCBN111 MCBN121	16	BIOC	X		X
BCHN222	BCHN222	Metabolism / <i>Metabolisme</i>	NCHE/CHEM111 NCHE/CHEM121 MCBN111 MCBN121	16	BIOC	X		X
BCHS316 (2019PC) (2020MC)	BCHS316	Enzymology / <i>Ensiemologie</i>	BCHN213 BCHN222	16	BIOC	X		X
BCHS317 (2019PC) (2020MC)	BCHS317	Molecular Biology / <i>Molekulêre Biologie</i>	BCHN213 BCHN222	16	BIOC	X		X
BCHS321 (2019PC) (2020MC)	BCHS321	Analytical Biochemistry / <i>Analitiese Biochemie</i>	BCHN213 BCHN222	16	BIOC	X		X
BCHS322 (2019PC) (2020MC)	BCHS322	Biochemistry Research Project / <i>Biochemie Navorsingsprojek</i>	BCHN213 BCHN222	16	BIOC	X		X
Biochemistry Old codes MC (phasing out)								
	BCHS 211	Introduction to Biochemistry I	MCHE 121 or SFCM 172	8	BIOC			X
	BCHS 212	Introduction to Biochemistry II	MCHE 121 or SFCM 172	8	BIOC			X
	BCHS 221	Metabolic Processes I	BCHS211 & 212	8	BIOC			X
	BCHS 222	Metabolic Processes II	BCHS211 & 212	8	BIOC			X
BCHS 314 (2019)	BCHS 314	Molecular and Cell Biology	BCHS211 & 212, BCHS 221 & BCHS 222	16	BIOC			X
BCHS 315 (2019)	BCHS 315	Advanced Biochemistry and Molecular Physiology	BCHS 211 & 212, BCHS 221 & BCHS 222	16	BIOC			X
BCHS 324 (2019)	BCHS 324	Analytical Biochemistry	BCHS 211 & 212, BCHS 221 & BCHS 222	16	BIOC			X

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MCBN-module codes								
BCHS325 (2019)	BCHS325	Project	BCHS 211 & 212, BCHS 221 & BCHS 222	16	BIOC			X
BCHS 326 (2019)	BCHS 326			32	Ex BIOL			X
MCBN-module codes								
MCBN111		Molecular Biology 1A	Maths	12	BIOC	X		X
MCBN121		Molecular Biology 1B	Maths	12	BIOC	X		XS
MCBN171	MCBN 171	Introduction to Molecular & Cell Biology I	NONE	12	Ext Prog MC			X
MCBN172	MCBN 172	Introduction to Molecular & Cell Biology II	MCBN 171	12	Ext Prog MC			X
	SFBM171 (old)	Introduction To Cell Biology	None	12	Ext Prog MC			X
	SFBM172 (old)	Introduction To Biological Concepts	SFBM 171	12	Ext Prog MC			X
Phasing out Biology programmes MC: no new intakes as from 2018 onwards								
	BGYM113	Introductory Biology	None	12	BIOL			X
	BGYM123	Plant systematics and lower vertebrates	None	12	BIOL			X
	BGYM212 (213)	Introductory Genetics	None	8	BIOL			X
	BGYM214	Bacteriology and Microbial Ecology	BGYM113 & 123 or SFBM 171 & SFBM 172	8	BIOL			X
	BGYM215	Taxonomy	BGYM113 & 123 or SFBM 171 & SFBM 172	8	BIOL			X
	BGYM 216	Ecology and Biostatistics	BGYM113 & 123 or SFBM 171 & SFBM 172	8	BIOL			X

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	BGYM225	Immunology and Virology	BGYM 113 & 123 or SFBM 171 & SFBM 172	8	BIOL			X
	BGYM226	Physiology & Intro to Entomology & Parasitology	BGYM 113 & 123 or SFBM 171 & SFBM 172	16	BIOL			X
	BGYM227 (221)	Advanced Molecular Genetics	BGYM 213	8	BIOL			X
	BGYM313 (222)	Bacterial Metabolism	BGYM 214	16	BIOL			X
BGYM(321) 314	BGYM314 (321)	Appl. Micro and Microbial Diversity	BGYM 214	16	BIOL			X
BGYM(312) 315	BGYM315 (312)	Systematics	BGYM 123 or SFBM 172	16	BIOL			X
BGYM(311) 316	BGYM316 (311)	Advanced Ecology and Biostatistics II	BGYM 216	16	BIOL			X
BGYM (311) 325	BGYM325 (311)	Developmental Biology		16	BIOL			X
BGYM(322) 326	BGYM326 (322)	Industrial Microbiology and Biotechnology	BGYM314(40%)	16	BIOL			X
BGYM371	BGYM371	UNDERGRADUTE PROJECT		18	BIOL			X
Old codes MC								
	BIYM111	Elements of Human Anatomy	None	12	BIOL			X
	BIYM112	Elements of physiology	None	12	BIOL			X
	BIYM114	Introduction to Microbiology	None	12	BIOL			X
	BIYM121	Human Anatomical Systems	None	12	BIOL			X
	BIYM122	Applied Biochemistry	None	12	BIOL			X
	BIYM124	Systems Physiology	None	12	BIOL			X

MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	M C M K
	BIYM125	Agric Zoology	None	12	BIOL			X
	BIYM221	Agric Biochemistry	None	12	BIOL			X
Business Management / Ondernemingsbestuur								
BMAN111	BMAN111	Introduction to Business Management / <i>Inleiding tot Ondernemingsbestuur</i>		12	BUSI	X		
BMAN223	BMAN222	Entrepreneurial Opportunities / <i>Entrepreneuriese Geleentheid</i>		16	BUSI	X		
BMAN223		Problem Solving for Managers		16		X	X	
Business Mathematics and Informatics / Bedryfswiskunde en Informatika								
BWIA111	BWIA111	Introduction to Financial Mathematics./ <i>Inleiding tot Finansiële Wiskunde</i>		12	BMI	X	X	
BWIA121	BWIA121	Introduction to Actuarial Science / <i>Inleiding tot Aktuariële Wetenskap</i>	BWIA111 WISN / MTHS111 (40%)	12	BMI	X	X	
	BWIA271 (2018) (replaced by BWIA271)	Financial Mathematics / <i>Finansiële Wiskunde</i>	BWIA121 WISN / MTHS121	32	BMI	X	X	
BWIA272 (2019)		Financial Mathematics / <i>Finansiële Wiskunde</i>	BWIA121 WISN / MTHS121	24	BMI	X		
BWIA273 (2019)	BWIA273	Basics of Financial Mathematics	BWIA121 WISN / MTHS121	16	BMI	X	X	
BWIA313	BWIA313	Actuarial Statistical Models / <i>Aktuariële Statistiese Modelle</i>	BWIA271/272/273	24	BMI	X	X	

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BWIA314	BWIA314	Stochastic Processes / Stogastiese Prosesse	BWIA271/272/273	12	BMI	X	X	
BWIA324	BWIA324	Survival Models / Oorlewingsmodelle	BWIA271/272/273	12	BMI	X	X	
BWIA371	BWIA371	Contingencies / Gebeurlikhede	BWIA271/272/273	32	BMI	X	X	
BWIN321	BWIN321	BMI Project: Capital Markets Modelling and Analysis / Bedryfswiskunde Projek: Effektebeursmodellering en analise	BWIA111 WISN / MTHS111	16	BMI	X	X	
Computer Science and Information Systems / Rekenaarwetenskap en Inligtingstelsels Old codes = ITRW & CISM								
CMPG111	ITRW111 (2017)	Introduction to Computing and Programming / Inleiding tot Rekenaarwese en Programmering		12	COMP	X	X	X
CMPG112	ITRW112 / CISM112 (2017)	Introduction to End User Computing/ Inleiding tot Rekenaareindgebruik		12	COMP	X	X	
CMPG115	ITRW115 (2017)	Programming for Engineers/ Programmering vir Ingenieurs		12	COMP	X		
CMPG121	ITRW124 / CISM122 (2017)	Structured Programming/ Gestruktureerde Programmering	CMPG111 or CMPG115(40%) or ITRW112 or ITRW115	12	COMP	X	X	X
CMPG122	ITRW123 (2018)	User Interface Programming/Gebruikerskoppelvlakprogrammering	CMPG111 or CMPG115(40%) or ITRW112 or ITRW115	12	COMP	X	X	
CMPG171	CMPG171	Introduction to computing and programming	NONE	12	Ext Prog MC			X

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CMPG172	CMPG172	Structured Programming	CMPG 171	12	Ext Prog MC			X
CMPG211	ITRW212 / CISM214 (2018)	Programming II / Programmering II Object Orientated Programming/ <i>Objekgeoriënteerde Programmering</i>	CMPG121 or ITRW124	16	COMP	X	X	X
CMPG212	ITRW211 (2018)	User Interface Programming II / <i>Gebruikerskoppelvlak programmering II</i>	CMPG122 or ITRW123	8	COMP	X	X	
	CISM 214 (2018)	Imperative and Object oriented Programming	CISM 122 or SFIM 172	8	COMP			X
CMPG214	ITRW315 (2019)	Communication Skills / <i>Kommunikasievaardighede</i>	CMPG121 or CMPG122 or ITRW123 or ITRW124	8	COMP	X	X	
CMPG213	ITRW213 (2018)	Systems Analysis and Design I / <i>Stelselontleding en Ontwerp I</i>	CMPG121 or CMPG122 or ITRW123 or ITRW124	16	COMP	X	X	X
CMPG215		Information Security / <i>Inligtingsekuriteit</i>	(CMPG121 or CMPG122 or ITRW123 or ITRW124) & MTHS113/123/111/112/114	8	COMP	X	X	
CMPG216		Data Visualisation / <i>Data Visualisering</i>	CMPG122 or ITRW123	8	COMP	X	X	
CMPG221	ITRW222 / CISM213 (2018)	Data Structures and Algorithms / <i>Datastrukture en Algoritmes</i>	CMPG211(40%) or ITRW212	16 8	COMP	X	X	X

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CMPG222		Data Analytics / <i>Data Analise</i>	MTHS111/113/123 or WISN111/113/123 & CMPG211/ 212 (40%) or ITRW211/212	8	COMP	X	X	
	CISM 225 (2018)	Introduction to Operating Systems	CISM 122 or SFIM 172	8	COMP			X
CMPG224	CISM 226 (CMPG 224)	Introduction to Software Engineering	CISM 122 or SFIM 172 CMPG121	8	COMP			X
CMPG223	ITRW225 (2018)	System Analysis and Design II / <i>Stelselontleding- en Ontwerp II</i>	CMPG213(40%) or ITRW213	16	COMP	X	X	X
CMPG311 (2020)	ITRW311 (2019)	Databases I / <i>Databasisse I</i> Databases / <i>Databasisse</i>	CMPG221 or CMPG223 or ITRW222 or ITRW225	16	COMP	X	X	X
CMPG312 (2020)	ITRW214 (2018)	Decision Support Systems I / <i>Besluitsteunstelsels I</i>	MTHS111 / 113 / 123/112 or WISN 111 / 113/ 123/112	16	COMP	X	X	
CMPG313 (2020)	ITRW317 / CISM326 (2019)	Artificial Intelligence / <i>Kunsmatige Intelligensie</i>	CMPG221 or ITRW222	16	COMP	X	X	X
CMPG315 (2020)	ITRW322 / CISM327 (2019)	Computer Networks / <i>Rekenaarnetwerke</i>	CMPG221 or ITRW222	16	COMP	X	X	X
ITRW313 (2019)	ITRW313	Expert Systems / <i>Deskundige stelsels</i>	ITRW211 or ITRW212	8	COMP	X	X	
CISM313 (2019)	CISM 313	Introduction to Database Systems	CISM 213, 214	16	COMP			X
CISM314 (2019)	CISM 314	Principles of Compiler Design	CISM 213, 214	16	COMP			X

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CMPG321 (2020)	ITRW321 (2019)	Databases II / Databasisse III / Advanced Databases / <i>Gevorderde Databasisse</i>	CMPG311(40%) or ITRW311	16	COMP	X	X	X
CMPG322 ((2020)	ITRW325 (2019)	Decision Support Systems II / <i>Besluitsteunstelsels II</i>	CMPG312(40%) or ITRW214	16	COMP	X	X	
CMPG323 (2020)	ITRW324 (2019)	IT Developments / <i>IT-ontwikkelings</i>	CMPG221 & CMPG311(40%) or (ITRW222 & ITRW311)	16	COMP	X	X	
CMPG324 (2020)	ITRW316 (2019)	Operating Systems / <i>Bedryfstelsels</i>	CMPG221 or ITRW222	16	COMP	X	X	X
CMPG325 (2020)		Computer Networks / <i>Rekenaarnetwerke</i>	CMPG221 or ITRW222	16	COMP	X	X	X
CISM326 (2019)	CISM326 (2019)	Artificial Intelligence Fundamentals	CISM 213,214	16	COMP			X
CISM327 (2019)	CISM327 (2019)	Data Communication and Networks	CISM 213,214	16	COMP			X
Extended programmes VTC IT codes / Verlengde programme VDK IT kodes								
	ITSP111	Introduction to Problem Solving/ <i>Inleiding tot Probleemoplossing</i>		12	Ext Prog VTC		X	
	ITSP113	Introduction to Graphical Interface Programming/ <i>Inleiding tot Grafiese Koppelvlakprogrammering</i>		16	Ext Prog VTC		X	
	ITSP114	Introduction to Object Orientated Programming/ <i>Inleiding tot Objekgeöriënteerde Programmering</i>		16	Ext Prog VTC		X	

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	ITSP121	Introductory Programming Principles/ <i>Inleidende Programmerings-beginsels</i>		12	Ext Prog VTC		X	
Agricultural / Landbou								
CSDM111	CSDM111	Botany for Agriculture	None	12	Dip Plant Scien			X
CSDM121	CSDM121	Introduction to Crop Production	None	12	Dip Plant Scien			X
CSDM211	CSDM211	Introduction to Soil Science	None	16	Dip Plant Scien			X
CSDM212	CSDM212	Agricultural Climatology	None	12	Dip Plant Scien			X
CSDM213	CSDM213	Farm Machinery	None	8	Dip Plant Scien			X
	CSDM214	Farm Practical		8	Dip crop Sc			X
CSDM215	CSDM215	Vegetable Production	CSDM121	8	Dip Plant Scien			X
CSDM221	CSDM221	Principles of Crop Improvement	CSDM111	16	Dip Plant Scien			X
CSDM222	CSDM222	Soil Fertility & Fertilizers	None	16	Dip Plant Scien			X
CSDM223	CSDM223	Soil Conservation	None	12	Dip Plant Scien			X
CSDM224	CSDM224	Farm Practice II	None	8	Dip Plant Scien			X
CSDM225	CSDM225	Fruit Production	CSDM 121	8	Dip Plant Scien			X
CSDM311	CSDM311	Agronomy of Summer Crops	CSDM211 & 223	8	Dip Plant Scien			X

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CSDM312	CSDM312	Plant Protection	CSDM 215 & 225	16	Dip Plant Scien			X
CSDM315	CSDM315	Pedology and Soil Classification	CSDM211 & 222	8	Dip Plant Scien			X
CSDM321	CSDM321	Agronomy of Winter Crops	CSDM211 & 223	8	Dip Plant Scien			X
CSDM322	CSDM322	Weeds & Weed Control	CSDM 215 & 225	16	Dip Plant Scien			X
CSDM323	CSDM323	Elements of Agricultural Microbiology	CSDM111	16	Dip Plant Scien			X
CSDM324	CSDM324	Elementary Irrigation	CSDM211 & 223	16	Dip Plant Scien			X
CSDM371		Practical Crop Production	CSDM224	16	Dip Plant Scien			X
CSMP411	CSMP411	Advanced Plant Breeding	CSPM326 & ANSM312	16	Agro & Hort			X
CSMP412	CSMP412	Horticultural Science	CSPM 313 & 323	12	Agro & Hort			X
CSPM211	CSPM211	Introduction to Soil Science	MCHE114 & 121	16	Agro & Hort			X
CSPM212	CSPM212	Agricultural Climatology	None	12	Agro & Hort			X
CSPM213	CSPM213	Farm Machinery	None	8	Agro & Hort			X
CSPM221	CSPM221	Introduction to Crop Production	None	16	Agro & Hort			X
CSPM222	CSPM222	Soil Fertility & Fertilizers	MCHE114 & 121	16	Agro & Hort			X
CSPM223	CSPM223	Soil Conservation	MCBN111 & 121	12	Agro & Hort			X

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	CSPM224 (old)			16	Agric			
CSPM225	CSPM225	Agricultural Microbiology	MCBN111 & 121	12	Agro & Hort			X
CSPM311	CSPM311	Agronomy of Summer Crops	CSPM211 & 221	8	Agro & Hort			X
CSPM313	CSPM313	Vegetable Production	CSPM221 & 222	16	Agro & Hort			X
CSPM317	CSPM317	Plant Pathology and Nematology	CSPM221	12	Agro & Hort			X
CSPM319	CSPM319	Agricultural Entomology	CSPM221	8	Agro & Hort			X
CSPM321	CSPM321	Agronomy of Winter Crops	CSPM211 & 221	8	Agro & Hort			X
CSPM322	CSPM322	Weed and Weed Control	CSPM221	16	Agro & Hort			X
CSPM323	CSPM323	Fruit Production	CSPM221	16	Agro & Hort			X
CSPM324	CSPM324	Principles of Irrigation	CSPM211 & 221	16	Agro & Hort			X
CSPM325	CSPM325	Plant Physiology	CSPM221	8	Agro & Hort			X
CSPM326	CSPM326	Principles of Genetics & Plant Breeding	CSPM221	8	Agro & Hort			X
CSPM327	CSPM327	Soil Survey and Land Use Planning	CSPM211 & 221	8	Agro & Hort			X
CSPM411	CSPM411	Crop Production Systems	CSPM 311 & 321	8	Agro & Hort			X
	CSPM412	Horticultural Science	CSPM313 & 323	12	Agric			

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CSPM415	CSPM415	Pedology & Soil Classification	CSPM 211	16	Agro & Hort			X
CSPM416		Soil Physics	CSPM 211	8	Agro & Hort			X
CSPM419		Soil Chemistry & Mineralogy	CSPM 211 & 222	12	Agro & Hort			X
CSPM421	CSPM421	Crop Physiology	CSPM 325	16	Agro & Hort			X
CSPM425		Applied Crop Protection	CSPM 317, 319 & 322	12	Agro & Hort			X
CSPM426		Soil Microbiology	CSPM 225	12	Agro & Hort			X
CSPM474		Research project and Seminar	ANSM312	32	Agro & Hort			X
CSPM479		Practical Crop Production Training	None	12	Agro & Hort			X
CSPM327	CSSS423 (change to CSPM327)	Soil Survey and Land use Planning.	CSPM211 & 222	8	Agro & Hort			X
Zoology / Dierkunde (PC)								
DRKN211	DRKN211	Developmental Biology / <i>Ontwikkelingsbiologie</i>	DRKS111 DRKS121	16	ZOO	X		
DRKN321	DRKN321	Animal Parasitology / <i>Dier Parasitologie</i>	DRKS211 DRKS221 DRKS311 (40%)	16	ZOO	X		
DRKS111	DRKS111	Invertebrates / <i>Invertebrate</i>		12	ZOO	X		
DRKS121	DRKS121	Chordates / <i>Chordata</i>	DRKS111 (40%)	12	ZOO	X		
DRKS221	DRKS221	Comparative Animal Physiology / <i>Vergelykende dierfisiologie</i>	DRKS111 DRKS121	16	ZOO	X		

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DRKS311	DRKS311	Ecology / <i>Ekologie</i>	DRKS211 DRKS221	32	ZOO	X		
DRKS322	DRKS322	Ethology / <i>Etologie</i>	DRKN211 DRKS221 DRKS311 (40%)	16	ZOO	X		
Economics / Economics								
ECON112	ECON111	Basic Micro Economics / <i>Basiese Mikro-ekonomie</i>		12	ECON			
ECON122	ECON121	Introduction to Macroeconomics / <i>Inleiding tot Makro-ekonomie</i>		12	ECON			
ECON212	ECON211	Macroeconomics / <i>Makro ekonomie</i>	ECON121/122 & WISN=MTHS111 /112 /123 or STTN111 & 122/ STFM111	16	ECON			
	ECON221 (change to ECON222)	Micro-economics / <i>Mikro ekonomie</i>	ECON111/112 & WISN=MTHS111 /112 /123 or STTN111 & 122/ STFM111	16	ECON			
ECON222		Microeconomics Applications		16	ECON			
ECON311 (2019)	ECON311	Fiscal and Monetary Policy / <i>Monetêre en Fiskale Beleid</i>		16	ECON			
ECON313 (2020)		Monetary Economics		16	ECON			
ECON314 (2020)		Public Economics		16	ECON			
ECON321 (2019)	ECON321	Economic Analysis / <i>Ekonomiese Analise</i>		16	ECON			
ECON322 (2020)	ECON322	Development Economics / <i>Ontwikkelings-ekonomie</i>		16	ECON			
ECON325 (2020)		Econometrics		16	ECON			

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Economic: Risk Management / Ekonomie: Risikobestuur								
EKRP211	EKRP211	Introduction to Risk Management / <i>Inleiding tot Risikobestuur</i>		16	RISK			
EKRP221	EKRP221	Investment Management / <i>Beleggingsbestuur</i>		16	RISK			
EKRP311	EKRP311	Bank Risk Management / <i>Bankrisikobestuur</i>		16	RISK			
EKRP321	EKRP321	Financial Markets / <i>Finansiële Markte</i>		16	RISK			
Electronics (MC)								
ELYM115	ELYM115	Electricity, Magnetism and Circuits	AP2 26, Maths Level 5, Phys Sc Level 4	12	Electr			X
ELYM127	ELYM127	Introduction to Electronics	APS 26, Maths Level 5, Phys Sc Level 4	12	Electr			X
ELYM215	ELYM215	Analogue Electronics and Systems	ELYM 115 & ELYM 127 or SFEM 171 & SFEM 172	16	Electr			X
ELYM227	ELYM227	Digital Electronics and Systems	ELYM 115 & ELYM 127 or SFEM 171 & SFEM 172	16	Electr			X
ELYM315	ELYM315	Advanced Analogue Electronics	ELYM 215 & ELYM 227	16	Electr			X
ELYM316	ELYM316	Intro to signals and System	ELYM 215 & ELYM 227	16	Electr			X
ELYM327	ELYM327	Advanced digital techniques and Systems	ELYM 215 & ELYM 227	16	Electr			X
ELYM328	ELYM328	Intro to microcontroller Systems	ELYM 215 & ELYM 227	16	Electr			X

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SFEM171	SFEM171	Electricity, Magnetism and Circuits	Admission into the faculty with Grade 12 Mathematics and Physical Science	12	EX Electr MC			X
SFEM172	SFEM172	Introduction to Electronics	SFEM 171	12	Ex Electr MC			X
Financial Management / Finansiële Bestuur (PC & VTC)								
FINM271	FINM221	Introduction to applied Financial Management / <i>Inleiding tot toegepaste Finansiële Bestuur</i>	ACCF121 or ACCC121 (40%); WISN/ MTHS112/123	18	FIN	X	X	
Physiology programmes / Fisiologie programme (PC)								
FKLT331 (2020)		Principles of Pharmacokinetics (method of delivery is WWW/Distance)		8	PHYS	X		
Physiology / Fisiologie (PC)								
FLGX113	FLGX113	Introductory Physiology / <i>Inleidende Fisiologie</i>		12	PHYS	X		
FLGX123	FLGX123	Membrane and Muscle Physiology / <i>Membraan en Spierfisiologie</i>	FLGX113	12	PHYS	X		
FLGX213	FLGX213	Endocrine System and Digestion / <i>Endokriene stelsel en Spysvertering</i>	FLGX113	16	PHYS	X		
FLGX223	FLGX223	Physiological Defence Mechanisms / <i>Fisiologiese verdedigingsmeganismes</i>	FLGX113	8	PHYS	X		
FLGX224	FLGX224	Metabolism / <i>Metabolisme</i>	FLGX213	8	PHYS	X		
FLGX312	FLGX312	Excretion / <i>Uitskeiding</i>		8	PHYS	X		
FLGX313	FLGX313	Respiration / <i>Respirasie</i>		8	PHYS	X		

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	FLGX314 (replace with/vervang met 317 & 329)	Cardiovascular Physiology / <i>Kardiovaskulêre Fisiologie</i>		16	PHYS	X		
FLGX317		Cardiovascular Physiology / <i>Kardiovaskulêre Fisiologie</i>		8	PHYS	X		
FLGX325	FLGX325	Neurophysiology / <i>Neurofisiologie</i>		16	PHYS	X		
FLGX326 (Phase out/ <i>faseer uit</i>)	FLGX326 (replace with / <i>vervang met</i> FLGX328)	Reproductive and Environmental Physiology / <i>Voortplanting en Omgewingsfisiologie</i>		16	PHYS	X		
FLGX328 (2020)		Reproductive physiology / <i>Voortplantingsfisiologie</i>		8	PHYS	X		
FLGX329		Cardiovascular physiology applications / <i>Kardiovaskulêre fisiologie toepassings</i>		8	PHYS	X		
Soil Science / Grondkunde (PC)								
GDKN121	GDKN121	Introduction to Soil Science / <i>Inleidende Grondkunde</i>		12	SOIL	X		
GDKN211	GDKN211	Advanced Soil Science / <i>Gevorderde Grondkunde</i>	GDKN121	16	SOIL	X		
GDKN221	GDKN221	Soil Degradation and Rehabilitation / <i>Gronddegradasie en rehabilitasie</i>	GDKN211 (40%)	16	SOIL	X		
GDKN311 (2021)		Soil Classification / <i>Grond Klassifikasie</i>		16	Agric 4jr PC	X		

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*FIELD MAPPING DURING THE DECEMBER HOLIDAY OF THE 3 RD YEAR IS A PREREQUISITE FOR 4TH YEAR REGISTRATION. The field mapping include fieldwork and soil mapping with regards to the application of basic field techniques, sampling, soil mapping techniques, application of the South African taxonomic classification system, certain laboratory analysis of field samples, fertiliser applications, data interpretation and report writing.								
GDKN421 (2021)		Precision farming / <i>Presisieboerdery</i>		24	Agric 4jr PC	X		
Geography / Geografie								
GGFS = PC old codes								
GEOG111	GGFS112 PC	Introduction to Physical Geography / <i>Inleiding tot Fisiese Geografie</i>		12	GEOG	X		X
GEOG171 MC	GEOG171 MC	Introduction to Physical Geography	NONE	12	Ext Prog MC			X
GEOG121	GGFS121 PC	Introductory to Human Geography / <i>Inleiding tot Menslike Geografie</i>		12	GEOG	X		X
GEOG172 MC	GEOG172 MC	Introduction to Human Geography	GEOG 171	12	Ext Prog MC			X
GEOG211	GGFS212 PC	Physical Geography / <i>Fisiese Geografie</i>	GGFS(111)112 & GGFS121 OR GEOG111 & GEOG121	16	GEOG	X		X
GEOG212	GEOG212	Environmental Thermodynamics / <i>Omgewingsstermodinamika</i>	MTHS111/121	8	GEOG	X		X
GEOM= MC old codes								
	GEOM113	Intro to Physical Geography		12	GEOG			X
	GEOM214 MC	Aspects of Human Geography	GEOM 113, GEOM 123 or SFGM 171 and SFGM 172	8	GEOG			X

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	GEOM215 MC	Geographical Statistics and Computers	GEOM 113, GEOM 123 or SFGM 171 and SFGM 172	8	GEOG			X
	GEOM224 MC	Aspects of Physical Geography	GEOM 113, GEOM 123 or SFGM 171 and SFGM 172	8	GEOG			X
	GEOM225 MC	Aerial Photography and Remote Sensing	GEOM 113, GEOM 123 or SFGM 171 and SFGM 172	8	GEOG			X
GEOG221	GGFS222* PC	Human Geography / Menslike Geografie	GGFS(111)112 & GGFS121 OR GEOG111 & GEOG121	16	GEOG	X		X
GEOG311 (2020)	GGFS312* (PC 2019)	GIS and Remote Sensing / GIS en Afstandwaarneming	GGFS(211)212	32	GEOG	X		X
GEOM 316 (MC 2019)	GEOM316 MC	Advanced Human Geography	GEOM 113, GEOM 123, or SFGM 171 and SFGM 172 GEOM 214	16	GEOG			X
GEOM 317 (MC 2019)	GEOM317 MC	Advanced Physical Geography	GEOM 113, GEOM 123, or SFGM 171 and SFGM 172 GEOM 224	16	GEOG			X
GEOG321 (2020)	GGFS322 (PC 2019)	Applied Geography / Toegepaste Geografie	GGFS(211)212 & GGFS(221)222 & GGFS(311)312 (40%)	32	GEOG	X		X
GEOM 328 (MC 2019)	GEOM328 MC	Introduction to Geographical Information Systems	GEOM 113, GEOM 123, or SFGM 171 and SFGM 172 GEOM 215, GEOM 225	16	GEOG			X

MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	M C M K
GEOM 329 (MC 2019)	GEOM329 MC	The Geography of African Development	GEOM 113, GEOM 123, or SFGM 171 and SFGM 172 GEOM 214	16	GEOG			X
Geology / Geologie (PC)								
GLGN112	GLGN112	Geology and the Environment / <i>Geologie en die omgewing</i>		12	GEOL	X		
GLGN122	GLGN122	South African Geology / <i>Suid-Afrikaanse Geologie</i>	GLGN112 (40%)	12	GEOL	X		
GLGN211	GLGN211	Mineralogy and Igneous Petrology / <i>Mineralogie en Stollingspetrologie</i>	GLGN112 GLGN122	16	GEOL	X		
GLGN221	GLGN221	Sedimentology, Structural Geology and Neotectonics / <i>Sedimentologie, Struktuurgeologie en Neo-tektoniek</i>	GLGN112 GLGN122 GLGN211 (40%)	16	GEOL	X		
GLGN311	GLGN311	Metamorphic Petrology and Geochemistry / <i>Metamorfe Petrologie en Geo-chemie</i>	GLGN112 GLGN211 GLGN221	32	GEOL	X		
GLGN321	GLGN321	Hydrogeology / <i>Hidrogeologie</i>	GLGN112 GLGN211 GLGN221 GLGN311(40%)	32	GEOL	X		
Indigenous Knowledge Systems (MC)								
IKSA 321 Note 3 MC	IKSA 321 Note 3 MC	African Indigenous Agriculture and Sustainable Community Livelihood and Development in Southern Africa	None	16	INDI Know Syst			X
IKSA 322 Note 3 MC	IKSA 322 Note 3 MC	Comparative African Indigenous Cultural, Bio-diversity and Heritage	IKSM224	16	INDI Know Syst			X

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IKSA 323 Note 3 MC	IKSA 323 Note 3 MC	Comparative African Indigenous and Western Food Security Systems	IKSM125	16	INDI Know Syst			X
IKSA 413 Note 4 MC	IKSA 413 Note 4 MC	Indigenous Knowledge and Renewable Energy Sources for Sustainable Livelihood II-	None	16	INDI Know Syst			X
IKSA311 Note 2 MC	IKSA311 Note 2 MC	Impact of Climate Change on African Indigenous Food Security Systems	IKSM114	16	INDI Know Syst			X
IKSC 311 Note 2 MC	IKSC 311 Note 2 MC	Comparative Western and African Indigenous Life Skills Education	ISKM115	8	INDI Know Syst			X
IKSC 321 Note 3 MC	IKSC 321 Note 3 MC	African Traditional Governance and Democracy	None	16	INDI Know Syst			X
IKSC 322 Note 3 MC	IKSC 322 Note 3 MC	African Indigenous Music and Dance	None	16	INDI Know Syst			X
IKSC 323 Note 3 MC	IKSC 323 Note 3 MC	Gender in African Indigenous Arts and Culture-	None	16	INDI Know Syst			X
IKSC 413 Note 4 MC	IKSC 413 Note 4 MC	African Indigenous Music and Drama-	None	16	INDI Know Syst			X
IKSC312 Note 2 MC	IKSC312 Note 2 MC	Comparative African Indigenous and Western Peace and Conflict Resolution Approaches	None		INDI Know Syst			X
IKSH 314 Note 2 MC	IKSH 314 Note 2 MC	Gender in African Indigenous Health Care Systems	IKSM 111; IKSM 121	8	INDI Know Syst			X
IKSH 321 Note 3 MC	IKSH 321 Note 3 MC	African Indigenous Health Care Providers	IKSM 111; IKSM 121	16	INDI Know Syst			X
IKSH 322 Note 3 MC	IKSH 322 Note 3 MC	Indigenous Knowledge and Innovations in Public Health Care 1	IKSM 111; IKSM 121	16	INDI Know Syst			X

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IKSH 323 Note 3 MC	IKSH 323 Note 3 MC	African Traditional Medicine and Health Care Systems 1	IKSM 111; IKSM 121	16	INDI Know Syst			X
IKSH 411 Note 4 MC	IKSH 411 Note 4 MC	African Traditional Medicine and Health Care Systems 11	IKSH 322	16	INDI Know Syst			X
IKSH311 Note 2 MC	IKSH311 Note 2 MC	Comparative Health Care Systems	IKSM 111; IKSM 121	16	INDI Know Syst			X
IKSH312 Note 2 MC	IKSH312 Note 2 MC	African Indigenous Medicinal and Nutritional Significance of Living Organisms	IKSM 111; IKSM 121	16	INDI Know Syst			X
IKSH313 Note 2 MC	IKSH313 Note 2 MC	Theories of African Indigenous Community Innovation Systems for Sustainable Livelihood	None	16	INDI Know Syst			X
IKSM 321 Note 3 MC	IKSM 321 Note 3 MC	African Indigenous Metallurgy	None	16	INDI Know Syst			X
IKSM 322 Note 3 MC	IKSM 322 Note 3 MC	Indigenous Knowledge (IK) and Innovations in Public Health Care	None	16	INDI Know Syst			X
IKSM 323 Note 3 MC	IKSM 323 Note 3 MC	Comparative African Indigenous Textile Technologies	None	16	INDI Know Syst			X
IKSM 324 Note 3 MC	IKSM 324 Note 3 MC	Indigenous Knowledge and Renewable Energy Sources for Sustainable Livelihood	None	16	INDI Know Syst			X
IKSM 411* Note 4 MC	IKSM 411* Note 4 MC	Basic Research Methods	None	16	INDI Know Syst			X
IKSM 412* Note 4 MC	IKSM 412* Note 4 MC	Qualitative and Quantitative Research in IKS	None	16	INDI Know Syst			X
IKSM 413 Note 4 MC	IKSM 413 Note 4 MC	African Traditional Governance and Democracy	None	16	INDI Know Syst			X
IKSM111 Note 1 MC	IKSM111 Note 1 MC	The Nature of Indigenous Knowledge Systems and Innovations	None	12	INDI Know Syst			X

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IKSM112 Note 1 MC	IKSM112 Note 1 MC	African Languages and Communication Systems	None	12	INDI Know Syst			X
IKSM113 Note 1 MC	IKSM113 Note 1 MC	Introduction to Health Care Systems in relation to Indigenous Knowledge Systems (IKS)	None	12	INDI Know Syst			X
IKSM114 Note 1 MC	IKSM114 Note 1 MC	The Role of Indigenous Knowledge Systems in Climate Change	None	12	INDI Know Syst			X
IKSM115 Note 1 MC	IKSM115 Note 1 MC	Introduction to African Indigenous Life Skills Education	None	12	INDI Know Syst			X
IKSM121 Note 1 MC	IKSM121 Note 1 MC	A Historiography of African Science and Technology	None	12	INDI Know Syst			X
IKSM122 Note 1 MC	IKSM122 Note 1 MC	Introduction to Tools of Indigenous Knowledge Management	None	12	INDI Know Syst			X
IKSM123 Note 1 MC	IKSM123 Note 1 MC	The Use and Roles of Signs and Symbols in African Communities	None	12	INDI Know Syst			X
IKSM124 Note 1 MC	IKSM124 Note 1 MC	The Nature and Roles of African Indigenous Health Care providers	None	12	INDI Know Syst			X
IKSM125 Note 1 MC	IKSM125 Note 1 MC	African Indigenous Food Security Systems	None	12	INDI Know Syst			X
IKSM212 Note 1 MC	IKSM212 Note 1 MC	African Cultural Astronomy	None	12	INDI Know Syst			X
IKSM213 Note 1 MC	IKSM213 Note 1 MC	The Nature and Characteristics of African Indigenous Health Care Systems	None	12	INDI Know Syst			X
IKSM214 Note 1 MC	IKSM214 Note 1 MC	African Indigenous Knowledge Development and Management	None	12	INDI Know Syst			X
IKSM215 Note 1 MC	IKSM215 Note 1 MC	Implications of Intellectual Property Rights (IPR) on Indigenous Knowledge Systems (IKS)/Traditional Knowledge (TK)	None	12	INDI Know Syst			X

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IKSM221 Note 1 MC	IKSM221 Note 1 MC	The Rights of Indigenous Peoples	None	12	INDI Know Syst			X
IKSM221 Note 1 4MC	IKSM221 Note 1 4MC	African Indigenous Architecture and Design	None	12	INDI Know Syst			X
IKSM222 Note 1 MC	IKSM222 Note 1 MC	African Indigenous Approaches to Peace and Conflict Resolution	None	12	INDIK now Syst			X
IKSM223 Note 1 MC	IKSM223 Note 1 MC	Socio-Cultural Protocols associated with African Traditional Medicine and Health Care Systems	None	12	INDI Know Syst			X
IKSM224 Note 1 MC	IKSM224 Note 1 MC	African Indigenous Cultural, Bio-Diversity and Heritage	None	12	INDI Know Syst			X
IKSM225 Note 1 MC	IKSM225 Note 1 MC	Foundations of African Indigenous Education	None	12	INDI Know Syst			X
IKSM312 Note 2 MC	IKSM312 Note 2 MC	Indigenous Medicinal and Nutritional Significance of Living Organisms	None		INDI Know Syst			X
IKSM313 Note 2 MC	IKSM313 Note 2 MC	Theories of African Indigenous Community Innovation for Sustainable Livelihoods	IKSM 111; IKSM 121		INDI Know Syst			X
IKSM421* Compulsory MC	IKSM421* Compul- sory MC	Internship and Research Project	IKSM 411, IKSM 412	64	INDI Know Syst			X
IKSS 321 Note 3 MC	IKSS 321 Note 3 MC	African Indigenous Metallurgy I	IKSM 111; IKSM 121	16	INDI Know Syst			X
IKSS 322 Note 3 MC	IKSS 322 Note 3 MC	African Indigenous Ethno mathematics	IKSM 111; IKSM 121; IKSS 311	16	INDI Know Syst			X
IKSS 323 Note 3 MC	IKSS 323 Note 3 MC	Comparative African Indigenous Textile Technologies	IKSM 111; IKSM 121	16	INDI Know Syst			X
IKSS 324 Note 3 MC	IKSS 324 Note 3 MC	Indigenous Knowledge and Renewable Energy Sources for Sustainable Livelihood I-	IKSM 111; IKSM 121	16	INDI Know Syst			X
IKSS 413 Note 4 MC	IKSS 413 Note 4 MC	African Indigenous Metallurgy II	IKSS 321	16	INDI Know Syst			X

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IKSS311 MC Note 2	IKSS311 MC Note 2	Introduction to African Ethno- mathematics	IKSM 111; IKSM 121; IKSM 122	16	INDI Know Syst			X
IKSS312 MC note 2	IKSS312 MC note 2	Comparative African Indigenous and Western Science and Technology Systems	IKSM 111; IKSM 121	16	INDI Know Syst			X
Microbiology / Mikrobiologie								
MKBN121	MKBN121	Microbiology for Nursing / <i>Mikrobiologie vir Verpleegkunde</i>		12	MICR	X		
MKBN211 (2019=MC & PC)	MKBN211 (PC) MKBS211 & MKBS212 (MC) (2018)	Introductory Microbiology / <i>Inleidende Mikrobiologie</i>	NCHE111 NCHE121	16	MICR	X		X
MKBS221 (2019=MC & PC)	MKBS221 (PC) (2018)	Introductory Microbial Genetics, Virology and Immunology / <i>Inleidende mikrobiese genetika, virologie en immunologie</i>	MKBN211 (40%)	16	MICR	X		X
	MKBS222 (MC) (2018)	Microbial Diversity and Physiology (Bacteria, Fungi)	MKBS 211 & 212	8	MICR			X
	MKBS223 (MC) (2018)	Introduction to Recombinant DNA Technology and Bioinformatics	MKBS 211 & 212	8	MICR			X
MKBS313 (PC)	MKBS313	Microbial Physiology / <i>Mikrobiese Fisiologie</i>	MKBN211 MKBS221	16	MIRO	X		
MKBS314 (PC)	MKBS314	Recombinant DNA Technology and Industrial Microbiology / <i>Rekombinante DNA tegnologie & industriële Mikrobiologie</i>	MKBN211 MKBS221	16	MICR	X		

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MKBS316 (MC)	MKBS316	Microbial Ecology	MKBN 211, MKBS 221 or MKBS 211/ 212/ 222/223	16	MICR			X
MKBS317 (MC)	MKBS317	Environmental Microbiology and Public Health	MKBN 211, MKBS 221 or MKBS 211/ 212/ 222/223	16	MICR			X
MKBS325 (PC)[2019]	MKBS325 (PC)	Diversity and Ecology of Micro-organisms / <i>Diversiteit en Ekologie van Mikroörganismes</i>	MKBN211 MKBS221	32	MICR	X		
MKBS326 (MC)[2019]	MKBS326 (MC)	Industrial Microbiology and Biotechnology	MKBN 211, MKBS 221 or MKBS 211/ 212/ 222/223	16	MICR	X		
MKBS327 (MC)[2019]	MKBS327 (MC)	Virology and Immunology	MKBN 211, MKBS 221 or MKBS 211/ 212/ 222/223	16	MICR	X		
MKBX213	MKBX213	Microbiology for Food and Nutrition / <i>Mikrobiologie vir Voedsel en Voeding</i>		8	MICR	X		
MKPN111	MKPN111	Microbiology (for Pharmacy) / <i>Mikrobiologie (vir Farmasie)</i>		12	MICR	X		
Mathematics / Wiskunde								
PC old code = WISN & MC old code = MAYM & CFMA								
MTHS111	WISN111/ MAYM117	Introductory Algebra and Analysis I / <i>Inleidende Algebra en Analise I</i> Introductory Algebra and Calculus I / <i>Inleidende Algebra en Calculus I</i>	Gr12 Maths level 5/ <i>Wiskunde vlak 5</i>	12	MATH	X	X	X

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MTHS112	WISN112	Advanced Mathematical Techniques/ <i>Gevorderde Wiskundige Tegnieke</i>	Gr12 Maths level 4/ <i>Wiskunde vlak 4</i> Extended WISS112 & 122	12	MATH	X	X	
MTHS113	WISN113	Basic Mathematical Techniques/ <i>Basiese Wiskundige Tegnieke</i>	Gr12 Maths level 4/ <i>Wiskunde vlak 4</i>	12	MATH	X	X	
MTHS114	MAYM116	Applied Calculus I/ <i>Toegepaste Calculus I</i>	Gr12 Maths level 4/ <i>Wiskunde vlak 4</i>	12	MATH	X		X
MTHS115	MAYM115	Pre-Calculus for Science I	Gr12 Maths level 3	12	Dipl			X
MTHS119	CFMA111	Pre-Calculus for Commerce I	Gr12 Maths level 3	12	MATH		X	X
MTHS 171		Introductory Algebra and Calculus I	NONE	12	Ext Prog MC			X
MTHS172		Introductory Algebra and Calculus II	MTHS 171	12	Ext Prog MC			X
MTHS173		Applied Calculus I	NONE	12	Ext Prog MC			X
MTHS174		Applied Calculus II	MTHS 173	12	Ext Prog MC			X
MTHS121	WISN121 / MAYM127	Introductory Algebra and Analysis II/ <i>Inleidende Algebra en Analise II</i> Introductory Algebra and Calculus II/ <i>Inleidende Algebra en Calculus II</i>	MTHS111 / WISN111(40%)	12	MATH	X	X	X
MTHS123	WISN123	Mathematical Techniques/ <i>Wiskundige Tegnieke</i>	Gr12 Maths level 4/ <i>Wiskunde vlak 4</i>	12	MATH	X	X	

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MTHS124	MAYM126	Applied Calculus II/ <i>Toegepaste Calculus II</i>	MTHS114(40%) or WISN111 / MTHS111 or MAYM116	12	MATH	X		X
MTHS125	MAYM125	Pre-Calculus for Science II	MTHS115(40%)	12	Dipl			X
MTHS129	CFMA121	Pre-Calculus for Commerce II	MTHS119(40%)	12	MATH		X	X
MTHS211	WISN211/ Part of MAYM227	Analysis III/ <i>Analise III</i> Multivariable Calculus II/ <i>Meerveranderlike Calculus I</i>	WISN121/ MTHS121	8	MATH	X	X	X
MTHS212	WISN212/ Part of MAYM217	Linear Algebra I/ <i>Lineêre Algebra I</i>	WISN121/ MTHS121	8	MATH	X	X	X
	MAYM217	Linear Algebra	All first year modules in Maths	16	MATH			X
	MAYM227	Advanced Calculus	All first year modules in Mathematics	16	MATH			X
MTHS221	WISN224/ Part of MAYM227	Analysis IV/ <i>Analise IV</i> Multivariable Calculus II/ <i>Meerveranderlike Calculus II</i>	WISN211/ MTHS211(40%)	8	MTHS	X	X	X
MTHS222	WISN226/ Part of MAYM217	Linear Algebra II/ <i>Lineêre Algebra II</i>	WISN212/ MTHS212(40%)	8	MATH	X	X	X
MTHS223	WISN225	Engineering Analysis/ <i>Ingenieursanalise</i>	WISN211/ MTHS211(40%)	8	MATH	X		
MTHS224	WISN227	Applied Linear Algebra / <i>Toegepaste Lineêre Algebra</i>	WISN212/ MTHS212(40%)	8	MATH	X		

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MTHS225	WISN223	Discrete Mathematics/ <i>Diskrete Wiskunde</i>	WISN111 or WISN112 or WISN113 or WISN123/ MTHS111 or MTHS112 or MTHS113 or MTHS123	8	MATH	X	X	
WISN324 (2019) MTHS321 (2020)	WISN323 (replaced by WISN314) (PC2019) MAYM317 (2019)	Real Analysis/ <i>Reële Analise</i> (replaced by Complex Analysis=MTHS321)	WISN224 (221)/ MTHS221	16	MATH	X	X	X
WISN312 (PC2019) MTHS312 (2020)		Combinatorics/ <i>Kombinatorika</i>	WISN224 or WISN226 or MTHS212 & MTHS221	16	MATH	X		X
MAYM317 (MC2019)	MAYM317	Real Analysis	All second year modules in Mathematics	16	MATH			X
MAYM318 (MC2019)	MAYM318	Differential Equations	All second year modules in Mathematics	16	MATH			X
WISN323=now WISN314 WISN313= now WISN324								
WISN314 (2019) MTHS311 (2020)	WISN313 (replaced by WISN324) (PC2019) MAYM327 (2019)	Complex Analysis/ <i>Komplekse Analise</i> (Real Analysis=MTHS311)	WISN224 (221)/ MTHS221	16	MATH	X	X	X
MAYM327 (MC2019)	MAYM327	Complex Analysis	All second year modules in Mathematics	16	MATH			X

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MTHS322 (2020)	WISN322 (PC2019) MAYM328 (2019)	Algebraic Structures/ <i>Algebraïese Strukture</i>	WISN226 (222)/ MTHS222	16	MATH	X	X	X
MAYM328 (MC2019)	MAYM328	Abstract Algebra	All second year modules in Mathematics	16	MATH			X
Mathematics Ext VTC								
WISS111	WISS111	Introduction to Mathematics I / <i>Inleiding tot Wiskunde I</i>	Mathematics level 3 / <i>Wiskunde vlak 3</i>	12	Ext Prog VTC		X	
WISS113	WISS113	Introduction to Mathematical Techniques I / <i>Inleiding tot Wiskundige Tegnieke I</i>	Mathematics level 3 / <i>Wiskunde vlak 3</i>	12	Ext Prog VTC		X	
WISS121	WISS121	Introduction to Mathematics II / <i>Inleiding tot Wiskunde II</i>	WISS111 (40%)	12	Ext Prog VTC		X	
WISS123	WISS123	Introduction to Mathematical Techniques II / <i>Inleiding tot Wiskundige Tegnieke II</i>	WISS111 (40%)	12	Ext Prog VTC		X	

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Chemistry / Chemie PC old code = CHEM/CHEN; MC old code = MCHE								
NCHE111 (2018)		Introductory Inorganic and Physical Chemistry / <i>Inleidende Anorganiese en Fisiese Chemie</i>	None	12	CHEM	X		X
	CHEM111	Introductory Inorganic and Physical Chemistry / <i>Inleidende Anorganiese en Fisiese Chemie</i>	None	12		X		
	MCHE114	Introductory Chemistry I	None	12				X
MCHE115	MCHE115	Introductory Chemistry	None	12	Animal Scien Dip MC		MC only	
NCHE121 (2018)		Introductory Organic Chemistry / <i>Inleidende Organiese Chemie</i>	None	12	CHEM	X		X
	CHEM121	Introductory Organic Chemistry / <i>Inleidende Organiese Chemie</i>	None	12	CHEM	X		
	MCHE 121	Introductory Chemistry II	None	12				X
NCHE171 (2018)	SFCM 171	Introductory Inorganic and Physical Chemistry / <i>Inleidende Anorganiese en Fisiese Chemie</i>	NONE	12	Ext Prog MC			X
NCHE172 (2018)	SFCM 172	Introductory Organic Chemistry / <i>Inleidende Organiese Chemie</i>	NCHE171 or SFCM 171	12	Ext Prog MC			X

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NCHE211 (2019)	Analytical Chemistry II / <i>Analitiese Chemie II</i>		NCHE111, 121 or CHEM111, 121 or MCHE114, 121 or SFCM171, 172 or NCHE171, 172	8	CHEM	X		X
	CHEN211	Analytical Chemistry II / <i>Analitiese Chemie II</i>	NCHE 111, 121 or CHEM 111, 121	8	CHEM	X		
	MCHE223	Analytical Chemistry I	MCHE 114, 121 or SFCM 171, SFCM 172 or NCHE171, 172	8	CHEM			X
NCHE212 (2019)	Physical Chemistry II / <i>Fisiese Chemie II</i>		NCHE111, 121 or CHEM111, 121 or MCHE114, 121 or SFCM 171, 172 or NCHE171, 172 & MTHS111,121 or MTHS114, 124 or WISN111,121	8	CHEM	X		X
	CHEN212	Physical Chemistry II / <i>Fisiese Chemie II</i>	NCHE111, 121 or CHEM111, 121 or MCHE114, 121 or SFCM171, 172 or NCHE171, 172 & MTHS111,121 or MTHS114, 124 or WISN111,121	8	CHEM	X		
	MCHE215	Physical Chemistry I	MCHE114, MCHE121 or SFCM171, SFCM172 or NCHE171, 172	8	CHEM			X

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NCHE213 (2019)	CHEN213	Organic Chemistry II / <i>Organiese Chemie II</i> Pharmacy/Biological Sciences / <i>Farmasie/Biologiese Wetenskappe</i>	NCHE111, 121 or CHEM 111, 121 (or SFCM171, 172 or NCHE171, 172)	8	CHEM	PC only <i>Slegs PK</i>		
NCHE221 (2019)	Inorganic Chemistry II / <i>Anorganiese Chemie II</i>		NCHE111, 121 or CHEM111, 121 or MCHE114, 121 or SFCM171, 172 or NCHE171, 172 & MTHS111,121 or MTHS114, 124 or WISN111,121	8	CHEM	X		X
	CHEN222	Inorganic Chemistry II / <i>Anorganiese Chemie II</i>	NCHE111, 121 or CHEM111, 121 & MTHS111,121 or MTHS114, 124 or WISN111,121	8	CHEM	X		
	MCHE216	Inorganic Chemistry I	MCHE114 or MCHE121 or SFCM171 & SFCM 172 or NCHE171, 172	8	CHEM			X
NCHE222 (2019)	Organic Chemistry II / <i>Organiese Chemie II</i>		NCHE111, 121 or CHEM111, 121 or MCHE114, 121 or SFCM171, 172 or NCHE171, 172	8	CHEM	X		X
	CHEN223	Organic Chemistry II / <i>Organiese Chemie II</i>	CHEM111,121	8	CHEM	X		
	MCHE221	Organic Chemistry I	MCHE114 or MCHE121 or SFCM171 & SFCM172	8	CHEM			X

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NCHE311 (2020)	Analytical Methods III / <i>Analitiese Metodes III</i>		NCHE211 or CHEN211 or NCHE212	16	CHEM	X		X
	CHEM311 (PC2019)	Analytical Methods III / <i>Analitiese Metodes III</i>	CHEN211 or NCHE 212	16	CHEM	X		
	MCHE316 (MC2019)	Analytical Chemistry II	MCHE 223	16	CHEM			X
NCHE312 (2020)	Physical Chemistry III / <i>Fisiese Chemie III</i>		NCHE212 or CHEN212 or MCHE215	16	CHEM	X		X
	CHEN312 (PC2019)	Physical Chemistry III / <i>Fisiese Chemie III</i>	NCHE212 or CHEN212	16	CHEM	X		
	MCHE321 (MC2019)	Physical Chemistry II	MCHE215, PHYM118, PHYM124, MAYM116 or 117, MAYM126 or 127	16	CHEM			X
NCHE321 (2020)	Inorganic Chemistry III / <i>Anorganiese Chemie III</i>		NCHE221 or CHEN222 or MCHE216	16	CHEM	X		X
	CHEN321 (PC2019)	Inorganic Chemistry III / <i>Anorganiese Chemie III</i>	NCHE221 or CHEN 222	16	CHEM	X		
	MCHE322 (MC2019)	Inorganic Chemistry II	MCHE 216	16	CHEM	X		
NCHE322 (2020)	Organic Chemistry III / <i>Organiese Chemie III</i>		NCHE222 or CHEN223 or MCHE221	16	CHEM	X		X
	CHEN322 (PC2019)	Organic Chemistry III / <i>Organiese Chemie III</i>	NCHE222 or CHEN223	16	CHEM	X		
	MCHE315 (MC2019)	Organic Chemistry II	MCHE 221	16	CHEM			X
Physics / Fisika								
NPHY111	FSKS111	Basic Physics I / <i>Basiese Fisika 1</i>		12	FIS	X		X

MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	M C M K
NPHY 171	NPHY171	Basic Physics I	NONE	12	Ext Prog MC			X
FSKS113	FSKS113	Physics for Biology I / <i>Fisika vir biologie I</i>		12	FIS	X		
NPHY121	FSKS121	Basic Physics II / <i>Basiese Fisika II</i>	NPHY111 MTHS111 (40%)	12	FIS	X		X
NPHY172	NPHY172	Basic Physics II	NPHY 171	12	Ext Prog MC			X
NPHY123		Introduction to Physics	Admissions into Agriculture degree program	12	FIS			X
NPHY124		Introduction to Basic Physics Concepts	Admissions into Agriculture diploma program	12	FIS			X
FSKS123	FSKS123	Physics for Biology II / <i>Fisika vir biologie II</i>	FSKS113 (40%)/ NPHY111	12	FIS	X		
NPHY211	FSKS211 (2018)	Electricity and Magnetism / <i>Elektrisiteit en magnetisme</i>	FSKS / NPHY121 TGWN / APPM121 or TGWN/ APPM122 or WISN/ MTHS121	8	FIS	X		X
NPHY212	FSKS222 (2018)	Introductory Quantum Physics / <i>Inleidende kwantumfisika</i>	FSKS211 WISN/ MTHS121	8	FIS	X		X
NPHY221	FSKS221 (2018)	Modern Physics / <i>Spesiale relatiwiteit</i>	FSKS211/ NPHY211(40%) & WISN121/ MTHS121	8	FIS	X		X
NPHY222	FSKS212 (2018)	(Optics / <i>Optika</i> =2018) Optics and waves / <i>Optika en golwe</i>	FSKS/ NPHY121 TGWN/ APPM121 or TGWN/ APPM122 or WISN/ MTHS121	8	FIS	X		X
	PHYM 215 (2018)	Mechanics and Thermal Physics	PHYM 118 & PHYM 128, or	8	FIS			X

			SFPM 171 & SFPM 172					
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MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	M C M K
	PHYM 216 (2018)	Atomic Physics	PHYM 118 & PHYM 128, or SFPM 171 & SFPM 172	8	FIS			X
	PHYM 221 (2018)	Waves and Quantum Mechanics	PHYM 118 & PHYM 128, or SFPM 171 & SFPM 172	8	FIS			X
	PHYM 222 (2018)	Electricity and Magnetism	PHYM 118 & PHYM 128, or SFPM 171 & SFPM 172	8	FIS			X
NPHY311 (2020)	FSKS311 (2019)	Electromagnetism / <i>Elektromagnetisme</i>	FSKS/ NPHY211 & WISN/ MTHS211	16	FIS	X		
NPHY312 (2020)	FSKS312 (2019)	Wave Mechanics / <i>Golfmeganika</i>	FSKS/ NPHY211/ FSKS222/ NPHY212/ WISN/ MTHS211/ FSKS/ NPHY221	16	FIS	X		
NPHY321 (2020)	FSKS321 (2019)	Thermodynamics / <i>Termodinamika</i>	FSKS/ NPHY121/ WISN/ MTHS211	16	FIS	X		
NPHY322 (2020)	FSKS322 (2019)	Nuclear Physics and Elementary Particles / <i>Kernfisika en elementêre deeltjies</i>	FSKS312(40%)	16	FIS	X		
NPHY323 (2020)	FSKS323 (2019)	Astro- and Space physics / <i>Astro- en ruimtefisika</i>	FSKS/ NPHY211/ FSKS/ NPHY212/ FSKS/ NPHY221	16	FIS	X		
MC PHYSICS 3rd year modules 2019								
PHYM 315	PHYM 315	Classical Mechanics	All second year modules in Physics	8	FIS			X
PHYM 316	PHYM 316	Solid State Physics	All second year modules in Physics	8	FIS			X

MODULE CODE / KODE 2019 →	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	M C M K
PHYM 317	PHYM 317	Quantum Mechanics	All second year modules in Physics	8	FIS			X
PHYM 318	PHYM 318	Project and Research	All second year modules in Physics	8	FIS			X
PHYM 321	PHYM 321	Electromagnetism	All second year modules in Physics	8	FIS			X
PHYM 322	PHYM 322	Nuclear Physics	All second year modules in Physics	8	FIS			X
PHYM 323	PHYM 323	Statistical Physics	All second year modules in Physics	8	FIS			X
PHYM 324	PHYM 324	Project and Research	All second year modules in Physics	8	FIS			X
Agricultural degree / Landbougraad (4th yr modules 2022)								
OMSA422 (2022)		Weeds: Interactions and control / <i>Onkruid: interaksies en beheer</i>		16	Agric 4jr PC	X		
OMSA423 (2022)		Plant Pathology / <i>Plant Patologie</i>		16	Agric 4jr PC	X		
OMSE415 (2022)		Soil Microbiology and Soil Quality / <i>Grondmikrobiologie en grondkwaliteit</i>		16	Agric 4jr PC	X		
OMSE474 (2022)		Projects and Seminar / <i>Navorsingsprojek en Seminaar</i>		32	Agric 4jr PC	X		
OMWP411 (2022)		Pest phenology and damage symptoms / Econometrics <i>Plaagfenologie en skade-simptome</i>		16	Agric 4jr PC	X		

MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PRERE- QUISITES / VOORVER- EISTES	CR KR	PRO- GRAM	PC PK	VT C / VD K	M C M K
Botany / Plantkunde								
PLKS111	PLKS111	Plant structure and function / <i>Plantstruktuur en – funksie</i>		12	BOT	X		X
PLKS121	PLKS121	Biodiversity and Environmental Botany / <i>Biodiversiteit en omgewingsplant- kunde</i>	PLKS111(40%)	12	BOT	X		X
PLKS 171	PLKS 171	Plant Structure and Function	NONE	12	Ext Prog MC			X
PLKS 172	PLKS 172	Biodiversity and Environmental Botany	PLKS 171	12	Ext Prog MC			X
PLKN213	PLKN213	Plant Genomics / <i>Plantgenomika</i>	PLKS111& PLKS121	16	BOT	X		X
PLKS221	PLKS221	Flora of South Africa (Plant Systematics and Phytogeography) / Flora van Suid-Afrika (plantsistematiek en fitogeografie)	PLKS111 & PLKS121	16	BOT	X		X
PLKS312	PLKS312	Plant Physiology / <i>Plantfisiologie</i>	PLKN213(212)	32	BOT	X		
PLKS313	PLKS313	Terrestrial Plant Ecology: Ecosystems, Populations and Interactions / <i>Terrestriële Plant- ekologie: Ekosisteme, Bevolkings en Interaksies</i>	PLKS221	32	BOT			X
PLKN323	PLKN323	Plant Ecology / <i>Plantekologie</i>	PLKN213 & PLKS221	32	BOT	X		
PLKN324	PLKN324	Plant Development and Molecular Physiology / <i>Plantontwikkeling en Molekulêre Fisiologie</i>	PLKN213 & PLKS221	32	BOT			X

MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	MC MK
Urban and Regional Planning / Stads- en Streekbeplanning								
SBES212		Layout planning / <i>Uitleg beplanning</i>	SBSS111 (SBES111) SBSS121 (SBES121)	16	URB	X		
SBES313		Infrastructure planning / <i>Infrastruktuurbeplanning</i>	SBES212 (SBSS211)	16	URB	X		
SBRS221		Regional plans / <i>Streekplanne</i>	SBSS121 (SBES121) ECON211	16	URB	X		
SBRS313		Regional development theory / <i>Streekontwikkelings-teorie</i>	SBRS221 ECON321/325 MTHS114(113) STTN111 STTN124	16	URB	X		
SBRS411		Regional analysis and application / <i>Streeksanalise en –toepassing</i>	SBRS313 (SBRS311)	16	URB	X		
SBSS111		Planning and settlement history / <i>Beplannings- en nedersettingsgeskiedenis</i>	Admission requirements as described in N.1.6 / <i>Toelatingsvereistes soos in N.1.6 beskryf</i>	12	URB	X		
SBSS121		Introduction to Planning / <i>Inleiding tot Beplanning</i>	SBSS111(40%) (SBES111)	12	URB	X		
SBSS223		Urban design / <i>Stedelike ontwerp</i>	SBES212 (40%) (SBSS211)	16	URB	X		
SBSS313		Planning for sustainable cities / <i>Beplanning vir volhoubare stede</i>	SBSS223 (SBSS221) SBSS212 (40%) (SBSS211)	16	URB	X		
SBSS321		Transport planning and systems / <i>Vervoerbeplanning en stelsels</i>	SBES313(40%) (SBES321) SBRS221	16	URB	X		
SBSS323		Planning theory / <i>Beplanningsteorie</i>	SBSS313 (40%) (SBSS311)	16	URB	X		

			SBRS313 (40%) (SBRS311)					
MODULE CODE / KODE 2019 →	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PRO-GRAM	PC PK	VT C / VD K	MC MK
SBSS412		Integrated housing development / <i>Geïntegreerde behuisingsontwikkeling</i>	SBSS313 (40%) (SBSS311) SBSS323 (SBRS321)	16	URB	X		
SBSS414		Land use planning and development policy / <i>Grondgebruikbeplanning en ontwikkelingsbeleid</i>	SBES212 (SBSS211) SBES313 (SBES321)	16	URB	X		
SBSS424		Strategic- and participatory planning / <i>Strategiese- en deelnemende beplanning</i>	SBES313 (40%) (SBES321) SBSS323 (ou kode SBRS321) SBSS412(40%) SBSS414 (40%) (SBSL412)	16	URB	X		
SBSS472		Research project / <i>Navorsingsprojek</i>	SBSS313 (311) SBRS313 (311) SBES313 (321) SBSS321 SBSS323 (SBRS321) SECO321 GEOG311 =(GGFS312) ECON322	32	URB	X		
SECO321		Urban ecology for Planners / <i>Stedelike ekologie vir beplanners</i>	SBSS313 (40%) (SBSS311)	16	URB	X		
SGSS414		Research methodology for Geo- and Spatial Sciences / <i>Navorsingsmetodologie vir Geo- en Ruimtelike Wetenskappe</i>	SBSS323 (SBRS321)	16	URB	X		

MODULE CODE / KODE 2019→	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PRERE- QUISITES / VOORVER- EISTES	CR KR	PRO- GRAM	PC PK	VT C / VD K	M C M K
SRSK323		Urban risk management / Stedelike risikobestuur	SBSS313 (40%) (SBSS311)	16	URB	X		
SSBP421		Planning practice / Beplanningspraktyk	SBES313 (40%) (SBES311) SBSS321 SBSS414(40%) (SBSL412) SBSS412 (40%)	16	URB	X		

Statistics / Statistiek								
Extended VTC								
STTF115	STTF115	Descriptive Statistics / <i>Beskrywende Statistiek</i>		12	Ext Prog VTC		X	
STTF125	STTF125	Introductory Statistical Inference/ <i>Inleidende Statistiese Inferensie</i>	STTF115 (40%)	16	Ext Prog VTC		X	
STTF215	STTF215	Practical Statistics / <i>Praktiese Statistiek</i>	STTF125	16	Ext Prog VTC		X	
STTF225	STTF225	Introduction to Probability/ <i>Inleiding tot Waarskynlikheid</i>	STTF215 (40%) & WISN111/ MTHS111	16	Ext Prog VTC		X	
Statistics / Statistiek								
STTN111	STTN111	Descriptive Statistics / <i>Beskrywende Statistiek</i>		12	STATS	X	X	X
STTN115	STTN115	Descriptive Statistics and Inference / <i>Beskrywende Statistiek en Inferensie</i>		12	STATS	X	X	
STTN121	STTN121	Introductory Statistical Inference I / <i>Inleidende Statistiese Inferensie I</i>	STTN111 (40%) or STTN115 or STTN122	12	STATS	X	X	
STTN122	STTN122	Introductory Statistics / <i>Inleidende Statistiek</i>		12	STATS	X	X	X
STTN124	STTN124	Practical Statistics / <i>Praktiese Statistiek</i>	STTN111 (40%) or STTN115 or STTN122	12	STATS	X	X	
STTN125	STTN125	Introductory probability theory / <i>Inleidende waarskynlikheidsleer</i>	STTN111 (40%)&WISN/ MTHS111 (40%), Or STTN115 & WISN/ MTHS111, Or STTN122 & WISN MTHS111	12	STATS	X	X	

MODULE CODE / KODE 2019 →	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	M C M K
STTK214	STTK214	Statistics for Life Sciences' / <i>Statistiek vir Lewenswetenskappe</i>		16	STATS	X		
STTN215	STTN215	Probability and Sampling Theory / <i>Waarskynlikheid-sleer en Steekproefteorie</i>	STTN125 & WISN/ MTHS121	16	STATS	X	X	
STTN225	STTN225	Statistical Inference and Data Analysis / <i>Statistiese Inferensie en Data-analise</i>	STTN215 (40%)	16	STATS	X	X	
	STTN315 (2018)	Statistical Inference and Time Series Analysis / <i>Statistiese Inferensie en Tydreeksmodelle</i>	STTN225 (221)	32	STATS	X	X	
STTN316 (2019)		Linear models I / <i>Lineêre modelle I</i>	STTN225	24	STATS	X	X	
STTN317 (2019)		Statistical Software and Applications I / <i>Statistiese Sagteware en Toepassings I</i>	STTN225	8	STATS	X	X	
	STTK321 (2018)	Linear Models / <i>Lineêre modelle</i>	STTN315 (311)	24	STATS	X	X	
	STTK322 (2018)	Statistics project / <i>Statistiek projek</i>	STTN315 (311)	8	STATS	X	X	
STTN326 (2019)		Analysis of Dependent Data / <i>Analise van Afhanklike Data</i>	STTN225	16	STATS	X	X	
STTN327 (2019)		Statistical Software and Applications II / <i>Statistiese Sagteware en Toepassings II</i>	STTN317 (40%)	16	STATS	X	X	

MODULE CODE / KODE 2019 →	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	MC MK
Tourism / Toerisme								
TMBP111	TMBP111	Introduction to Tourism Management / <i>Inleiding tot Toerismebestuur</i>		12	TOUR	X		
TMBP211	TMBP211	Applied Tourism Management / <i>Toegepaste Toerismebestuur</i>	BMAN121	16	TOUR	X		
TMBP221	TMBP221	Tourism Marketing / <i>Toerismebemarking</i>		16	TOUR	X		
TMBP311	TMBP311	Sustainable ecotourism Management / <i>Volhoubare Ekotoerismebestuur</i>		16	TOUR	X		
TMBP312	TMBP312	Introduction to Event Management (choice module) / <i>Inleiding tot Gebeurtenisbestuur</i>		16	TOUR	X		
TMBP321	TMBP321	Game Farm Management / <i>Wildplaasbestuur</i>		16	TOUR	X		
TMBP322	TMBP322	Applied Event Management (choice module) / <i>Toegepaste Gebeurtenisbestuur</i>		16	TOUR	X		
Understand the world / Verstaan die wêreld								
WVAS221	WVAS221	Understanding the world of Agriculture	NONE	12	Agric Econ MC			X
WVCS221 Note 1	WVCS221 Note 1	Understanding the Cultural World	None	12	INDIG Knowl Syst MC			X
WVCS315* Note 2	WVCS315* Note 2	Man and Society	None		INDIG Knowl Syst MC			X
WVES221	WVES221	Understanding the economic world / <i>Verstaan die ekonomiese wêreld</i>		12	ETH	X		

MODULE CODE / KODE 2019 →	←2018 MODULE CODE / KODE	DESCRIPTIVE NAME / BESKRYWENDE NAAM	PREREQUISITES / VOORVEREISTES	CR KR	PROGRAM	PC PK	VT C / VD K	M C M K
WVES221	WVES221	Understanding the economic world / <i>Verstaan die ekonomiese wêreld</i>		12	ETH	X		
WVES311	WVES311	Business ethics / <i>Besigheidsetiek</i>		12	ETH	X		
WVNS211	WVNS211	Understand the Natural & Technological World / <i>Verstaan die natuurlike en tegnologiese wêreld</i>		12	ETH	X		
WVNS221	WVNS221	Science, technology and Society / <i>Wetenskap, tegnologie en samelewing</i>		12	ETH	X		
NOTE 1	Year level 1 & 2: Compulsory Note 1 All first and second year modules are compulsory for all students							
NOTE 2	Year level 3: Candidates have the choice of electives modules Note 2 In year three 1st semester students must take the compulsory module* and select 3 modules from the following							
NOTE 3	<u>Note:-3</u> In year three 2nd semester students must select four modules from the following							
NOTE 4	Year level 4: Candidates have the choice of electives modules <u>Note:-4</u> In year three 1st semester students must take the compulsory module* and select 3 modules from the following							

NAS.1.15 RULES FOR DIPLOMAS

After completion of the 3-year Diploma, a student can either exit with a diploma qualification or could proceed to register for a BSc degree in Agriculture provided they have applied for and been granted matriculation exemption prior to registering for the Degree program of choice. Successful applicants into BSc Programme may be credited for modules taken and passed during the course of the Diploma Programme provided that a final pass mark of **60% or more** was obtained in the module earmarked for exemption. A list of Diploma modules that are judged to be equivalent to BSc modules is available from the Schools. The granting of exemptions in the selected modules to students from the Diploma Program is based on the application of the Credit Accumulation and Transfer (CAT) policy.

After completion of the 3-year Diploma, a student can either exit with a diploma qualification or could proceed to register for a BSc Agric. Successful applicants into BSc Programme will **NOT be credited** for modules taken and passed during the course of the Diploma Programme. A Diploma candidate is, therefore, required to complete BSc programme. In the minimum period of 4 years.

NAS.1.15.1 Programme: Diploma in Animal Health

NAS.1.15.1.1 Specific programme outcomes

Purpose: The purpose of the qualification is to provide adequate vocational training which equips learners with a sound knowledge of disease surveillance, farm animals and production systems; and to identify problems related to the health, breeding, feeding, management and economics of livestock production, thus contributing to animal production whilst maintaining the animals' health and welfare, protecting humans from zoonosis and ensuring high-quality food products of animal origin for human consumption; and provide services to members of the veterinary profession, para-veterinary professionals, the animal population industry and the community as a whole.

NAS.1.15.1.2 New Programme: University Diploma in Animal Health

CODE: 2DYB01 - N302M

CAMPUS: MAFIKENG (ENGLISH)

DELIVERY MODE: FULL TIME

NEW PROGRAMME (1st & 2nd yrs)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE111	X	12	AXDM211	X	16	AHVM316	H	12
AEDM111	X	12	AHVM212	H	8	AHVM317	H	12
AHVM111	H	12	AHVM213	H	12	AHVM318	H	12
AHVM112	H	8	AHVM214	H	12	AHVM319	H	12
MTHS115	X	12	ANDM211	X	16	AHDM316	X	8
			ANDM212	X	8	AHDM317	X	8
			ANDM213	X	8			
Total 1st Semester		56	Total 1st semester		80	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE122	X	12	AHVM222	H	16	AHVM324	H	8
AHVM121	H	12	AHVM223	H	16	AHVM326	H	12
AHVM122	H	12	AHVM224	H	8	AHVM327	H	12
AHVM123	H	8	AHVM225	H	8	AHVM328	H	12
ANDM122	X	8	AHVM227	H	12	AHDM326	X	8
MTHS125	X	12	AHVM228	H	8			
			ANDM223	X	16			
Total 2nd semester		64	Total 2nd semester		88	Total 2nd semester		52
Total year level 1		120	Total year level 2		164	Total year level 3		116
Total credits for the programme								400

NAS.1.15.1.3 Old Programme (Phasing out) MC: Univ Diploma in Animal Health)

CODE: 2DYB01- N301M – Univ Diploma in Animal Health (3rd years)

CODE: 266 100-N102M – Diploma in Animal Health (Pipeline)

CAMPUS: MAFIKENG (ENGLISH)

DELIVERY MODE: FULL TIME

Year level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111 (X)	12	AHVM 213 (H)	12	AHVM 316 (H)	12
AHVM 111 (H)	12	AHVM 212 (H)	8	AHVM 317 (H)	12
AHVM 112 (H)	8	ANDM 211 (X)	16	AHVM 313 (H)	8
AEDM 111 (X)	12	ANDM 212 (X)	8	AHVM 318 (H)	12
MAYM 115 (X)	12	AXDM 211 (X)	16	AHVM 319 (H)	12
		ANDM 213 (X)	8		
Total 1st sem	56	Total 1st sem	68	Total 1st sem	56
Year level 1		Year level 2		Year level 3	
Second sem		Second sem		Second sem	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 121 (X)	12	AHVM 227 (H)	12	AHVM 326 (H)	12
AHVM 121 (H)	12	AHVM 222 (H)	16	AHVM 327 (H)	12
AHVM 122 (H)	12	AHVM 223 (H)	16	AHVM 323 (H)	8
AHVM 123 (H)	8	AHVM 224 (H)	8	AHVM 324 (H)	8
ANDM 122 (X)	8	AHVM 225 (H)	8	AHVM 328 (H)	12
MAYM 125 (X)	12	ANDM 225 (X)	16		
Total 2nd sem	64	Total 2nd sem	76	Total 2nd sem	52
Total level 1	120	Total level 2	144	Total level 3	108
Total credits for the curriculum 372					

*Core modules are indicated with (H) and ancillary modules with (X)

NAS.1.15.2 University Diploma in Animal Science

NAS.1.15.2.1 Specific programme outcomes

Purpose : The aim of the Diploma in Agriculture (Animal Science) is to give students a vocational training in the practical application of scientific principles to animal production.

CODE: 2FHB01 - N301M

CAMPUS: MAFIKENG (ENGLISH)

DELIVERY MODE: FULL TIME

NEW PROGRAMME (1st & 2nd yrs)

First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE111	X	12	AHVM211	X	16	AXDM311	X	8
AEDM111	X	12	ANDM211	H	16	AEDM314	X	8
AHVM111	X	12	ANDM212	H	8	ANDM312	H	16
MTHS115	X	12	AXDM211	X	16	ANDM313	H	16
MCHE115	X	12				ANDM314	H	16
Total 1st semester		60			56	Total 1st semester		64
Year level 1			Year level 3			Year level 3		
Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12	ANDM221	H	16	ANDM321	H	56
AHVM122	X	12	ANDM223	H	16			
ANDM121	X	12	ANDM225	H	16			
CSDM121	H	12	AHVM226	H	16			
MTHS125	X	12						
Total 2nd semester		60	Total 2nd semester		64	Total 2nd semester		56
Total year level 1		120	Total year level 2		120	Total year level 3		120
Total credits for the curriculum								360

NAS.1.15.2.2 Old Programme (Phasing out) MC: Univ Diploma in Agriculture in Animal Science

CODE: 279 100-N101M- Univ Diploma in Agric in Animal Science (3rd yrs)

CAMPUS: MAFIKENG (ENGLISH)

DELIVERY MODE: FULL TIME

Year level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 111 (X)	12	ANDM 211 (H)	16	AEDM 314 (X)	08
MCHE 115 (X)	12	AHVM 211 (X)	16	ANDM 312 (H)	16
AHVM 111 (X)	12	ANDM 212 (H)	08	ANDM 313 (H)	16
MAYM 115 (X)	12	AXDM 211 (X)	16	ANDM 314 (H)	16
AEDM 111 (X)	12			AXDM 311 (X)	08
Total 1st sem	60	Total 1st sem	56	Total 1st sem	64
Year level 1		Year level 2		Year level 3	
Second sem		Second sem		Second sem	
Module code	Cr	Module code	Cr	Module code	Cr
AGLE 121 (X)	12	ANDM 221 (H)	16	ANDM 321 (H)	56
AHVM 122 (X)	12	ANDM 223 (H)	16		
MAYM 125 (X)	12	ANDM 225 (H)	16		
CSDM 121 (X)	12	AHVM 226 (X)	16		
ANDM 121 (H)	12				
Total 2nd sem	60	Total 2nd sem	64	Total 2nd sem	56
Total level 1	120	Total level 2	120	Total level 3	120
Total credits for the curriculum: 360					

NAS.1.15.3 New Programme: University Diploma in Plant Science with Crop Production:

CODE: 2FJ B01 - N301M

CAMPUS: MAFIKENG (ENGLISH)

DELIVERY MODE: FULL TIME

NEW PROGRAMME (1st & 2nd yrs)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE111	X	12	AXDM211	X	16	AXDM311	X	8
AEDM111	X	12	CSDM211	H	16	AEDM314	X	8
CSDM111	H	12	CSDM212	H	12	CSDM311	H	8
MTHS115	X	12	CSDM213	H	8	CSDM312	H	16
MCHE115	X	12	CSDM215	H	8	CSDM315	H	8
						CSDM371	H	8
Total 1st semester		60			60	Total 1st semester		56
Year level 1			Year level 3			Year level 3		
Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12	CSDM221	H	16	CSDM321	H	8
ANDM121	X	12	CSDM222	H	16	CSDM322	H	16
CSDM121	H	12	CSDM223	H	12	CSDM323	H	16
MTHS125	X	12	CSDM224	H	8	CSDM324	H	16
NPHY124	X	12	CSDM225	H	8	CSDM371	H	8
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		120
Total credits for the curriculum								360

NAS.1.15.3.1 OLD PROGRAMME (Phasing out) MC: Univ Diploma in Agric and Crop Science

CODE: 279 101- N101M- Univ Diploma in Agric in Crop Science (3rd yrs)

CAMPUS: MAFIKENG (ENGLISH)

DELIVERY MODE: FULL TIME

Year level 1		Year level 2		Year level 3	
First semester		First semester		First semester	
Module code	Cr	Module code	Cr	Module code	Cr
MICHE 115 (X)	12	CSDM 211 (H)	16	CSDM 311 (H)	8
CSDM 111 (H)	12	CSDM 214 (H)	8	CSDM 312 (H)	16
MAYM 115 (X)	12	CSDM 212 (H)	12	AXDM 311 (X)	8
AGLE 111 (X)	12	AXDM 211 (X)	16	AEDM 314 (X)	8
AEDM 111 (X)	12	CSDM 213 (H)	8	CSDM315 (H)	8
		CSDM 215 (H)	8		
Total 1st sem	60	Total 1st sem	68	Total 1st sem	48
Year level 1		Year level 3		Year level 3	
Second sem		Second sem		Second sem	
Module code	Cr	Module code	Cr	Module code	Cr
MAYM 125 (X)	12	CSDM 222 (H)	16	CSDM 321 (H)	8
CSDM 121 (H)	12	CSDM221 (H)	16	CSDM 322 (H)	16
ANDM 121 (X)	12	CSDM 224 (H)	8	CSDM 325 (H)	8
PHYM128 (X)	12	CSDM 223 (H)	12	CSDM 324 (H)	16
AGLE 121 (X)	12	CSDM 225 (H)	8	CSDM 323 (H)	16
Total 2nd sem	60	Total 2nd sem	60	Total 2nd sem	64
Total level 1	120	Total level 2	128	Total level 3	112
				TOTAL	360

*Core modules are indicated with (H) and ancillary modules with (X)

NAS.1.16 RULES FOR THE DEGREE BACHELOR OF SCIENCE (BSC) / REËLS VIR DIE GRAAD BACCALAUREUS SCIENTIAE (BSC)

NAS.1.16.1 Duration (minimum and maximum duration) / Duur (minimum en maksimum duur)

[A-Rule/ A-Reël 1.14]

Full time: The minimum duration of the studies for a BSc 3yr degree is three years and BSc 4yr degree, is four years and the maximum duration for completing the degree is five years for a 3yr and six years for a 4yr degree.

Voltyds: Die minimum duur van die studie vir 'n BSc 3jr graad is drie jaar en vir 'n BSc 4jr graad, is 4jr en die maksimum tydsduur vir die voltooiing van die graad is vyf jaar vir 'n 3jr en ses jaar vir 'n 4jr graad.

Distance learning: The minimum duration of the studies for a BSc degree is three years and the maximum duration for completing the degree is six years.

Afstandstudie: Die minimum duur van die studie vir 'n BSc-graad is drie jaar en die maksimum tydsduur vir die voltooiing van die graad is ses jaar.

NAS.1.16.2 Faculty-specific requirements / Fakulteitspesifieke toelatingsvereistes

See paragraph/ Kyk paragraaf NAS.1.16

NAS.1.16.3 Structure of a generic Bachelor of Science degree / Struktuur van 'n generiese Baccalaureus Scientiae graad

The diagram shows how a generic BSc degree is compiled. Professional degrees are compiled differently. / Die diagram dui aan hoe 'n generiese BSc-kwalifikasie saamgestel word. Professionele grade verskil hiervan.

	Semester 1						Semester 2									
Year / Jaar 1 (Tot. cr./ kr. = 120)	12	12	12	12	12 ALDE/A		12	12	12	12	12 ALDE/A					
Year / Jaar 2 (Tot. cr. / kr. = 120)	8	8	8	8	8	8	12 WVNS		8	8	8	8	8	8	12 WVNS	
Year / Jaar 3 (Tot. cr. / kr. = 128)	16		16		16		16		16		16		16			
TOTAL CREDITS / TOTALE KREDIETE (368)	184 credits / krediete						184 credits / krediete									

NAS.1.16.4 Outcomes of a GENERIC BACHELOR OF SCIENCE degree / Uitkomst vir 'n GENERIESE BACCALAUREUS SCIENTIAE graad

(a) General / Algemeen

At the end of the study period, the student will have the ability to integrate the basic knowledge and techniques of the core subjects in the curriculum he completed with a view to investigating phenomena in nature relevant to the core subjects of the curriculum and solving relevant problems. /

Aan die einde van die studie is die student in staat om die basiese kennis en tegnieke van die kernvakke van die kurrikulum wat hy voltooi het te integreer om verskynsels in die natuur wat met die kernvakke van die kurrikulum verband hou te ondersoek en gepaardgaande probleme op te los.

(b) Knowledge / Kennis

The student must have a thorough knowledge of the core subjects of the curriculum he completed in order to be able to apply his knowledge; to understand the physical reality in terms of this knowledge; and to be ready to continue with postgraduate studies in one of the core subjects. /

Die student moet 'n deeglike kennis van die kernvakke van die kurrikulum wat voltooi is, besit, sodat die kennis toegepas kan word; die fisiese werklikheid in terme van hierdie kennis verstaan kan word; die student gereed is om met nagraadse studie in een van die kernvakke voort te kan gaan.

(c) Skills / Vaardighede

The student must have acquired the following skills:

- the ability to retrieve knowledge and information electronically and otherwise in preparation of lifelong learning;
- the ability to perform mathematical-analytical and mathematical-numerical data processing, problem solving and modelling;
- the ability to process, evaluate and report on scientific information;
- where applicable, the basic laboratory skills;
- the ability to work in groups and where necessary to exercise the necessary leadership.

Die student moet die volgende vaardighede aangeleer het:

- *die vermoë besit om kennis en inligting te ontsluit, elektronies en andersins ter voorbereiding van lewenslange leer;*
- *wiskundig-analitiese en wiskundig-numeriese dataverwerking, probleemoplossing en modellering kan doen;*
- *in staat wees om wetenskaplike inligting te kan verwerk, evalueer en daarvoor verslag te kan doen;*
- *waar van toepassing oor basiese laboratoriumvaardighede beskik;*

- *in staat wees om in groepe te kan saamwerk en waar nodig leierskap te kan uitoefen/aanvaar.*

(d) Values / Waardes

The student ought to have acquired the following values:

- the ability to understand and strive after the normative aspects of practising science and in this way demonstrate a sense of responsibility towards fellow human beings and the environment in scientific investigations;
- scientific honesty and integrity.

Die student moet die volgende waardes aangeleer het:

- *die normatiewe aspekte van wetenskapsbeoefening verstaan en nastreef en sodoende 'n verantwoordelike teenoor die medemens en omgewing in wetenskaplike ondersoek openbaar;*
- *wetenskaplike eerlikheid en integriteit.*

NAS.1.16.4.1 Programmes / Programme

All curricula in this programme are compiled from the module list in N.14.

NOTE: Core modules (majors) are indicated by a (H). /

Al die kurrikulums is saamgestel uit modules in die modulelys in N.14.

OPMERKING: *Kernmodules (hoofvakke) word telkens met 'n (H) daarnaas aangedui.*

Every year a student registers subject to the rules valid for the specific year. If the curriculum/programme for which a student registered the previous year has been changed in this Calendar, the curriculum/programme of the student will be adapted according to the version in this Calendar. If possible, adaptation will be done in such a way that a student's study load will not be increased. /

'n Student registreer elke jaar onder die reëls wat vir die betrokke jaar geld. Indien die kurrikulum/program waarvoor 'n student in 'n voorafgaande jaar geregistreer het in hierdie jaarboek gewysig is, sal die student se kurrikulum/program aangepas word om in ooreenstemming te wees met die weergawe in hierdie jaarboek. Indien enigsins moontlik sal aanpassings so gedoen word dat 'n student se studielas nie daardeur verswaar word nie.

If obstacles such as insurmountable clashes in the schedule should arise because of necessary curriculum/programme changes, the Dean may decide that students who enrolled previously must switch to the changed curriculum/programme, even if an increase should result. /

Indien struikelblokke soos onoorkomelike roosterbotsings egter as gevolg van noodsaaklike kurrikulum- programwysigings sou ontstaan, mag die Dekaan beslis dat reeds ingeskrewe studente na die gewysigde kurrikulum/program sal oorslaan, al sou dit 'n verswaring tot gevolg hê.

In the case where students have to repeat one or more modules at a specific year level of a curriculum/programme, the following applies: /

In die geval waar studente in 'n bepaalde jaarvlak van 'n kurrikulum/program een of meer modules uit een of meer vorige jaarvlakke van 'n kurrikulum/program moet herhaal, geld die volgende:

- The total number of credits of the modules taken by a student in any semester at any year level, also by the student who has to repeat modules, is limited in accordance with the General Rule 2.3. /

Die totale kredietpunte van die modules wat 'n student, wat ook modules moet herhaal, in enige semester op enige jaarvlak mag neem, word beperk in ooreenstemming met Algemene Reël 2.3

- The Faculty cannot undertake that modules that have to be repeated and the other modules that must be taken will all fit in the class schedule. Clashes that arise because of modules that have to be repeated will result in the student having to take those modules in a future year. /

Die fakulteit kan nie onderneem dat modules wat herhaal moet word saam met die ander modules wat geneem moet word, op die rooster sal inpas nie; roosterbotsings wat ontstaan as gevolg van modules wat herhaal moet word, sal tot gevolg hê dat die student daardie modules in 'n latere jaar moet neem;

- If a student has not completed the modules of a specific year level of the curriculum/programme for which he enrolled in the minimum prescribed period of study, and the modules of the specific year level of the curriculum/programme have since been changed, the Dean may decide that the student must complete the relevant year level as published in the latest edition of the Calendar. This means that if a student must repeat a module that has since been replaced by another module, the Dean may decide that the student must take the latter module. /

Indien 'n student modules van 'n bepaalde jaarvlak van die kurrikulum/program waarvoor hy ingeskryf is, nie in die minimum voorgeskrewe studietydperk voltooi het nie en die modules van die betrokke jaarvlak van dié kurrikulum/program is intussen gewysig, mag die dekaan beslis dat die student die betrokke jaarvlak moet voltooi soos gepubliseer in die jongste uitgawe van die jaarboek. Dit kom daarop neer dat indien die student 'n module moet herhaal wat intussen in die kurrikulum/program deur 'n ander module vervang is, die dekaan mag beslis dat die student laasgenoemde module moet neem.

NAS.1.16.4.2 Articulation possibilities / Artikulasiemoontlikhede

- Credits will be awarded for modules that have been passed in other faculties or at other universities, provided such modules contribute to the outcomes and total credit requirements of the curriculum/programme concerned. /

Krediet sal verleen word vir modules wat in ander fakulteite of by ander universiteite geslaag is, mits sodanige modules bydra tot die uitkoms- en totale kredietvereistes van die betrokke kurrikulum/program.

- With the basic and applied skills that the student has acquired by this qualification in the mathematical, computer and natural science disciplines he will be prepared to continue further learning in several specialised subject areas at other institutions. /

Met die basiese en toepasbare vaardighede wat die student met hierdie kwalifikasie in die wiskundige, rekenaarkundige en natuurwetenskaplike dissiplines opgedoen het, sal die student toegerus wees om met verdere leer voort te gaan in verskeie gespesialiseerde vakgebiede aan ander inrigtings.

**NAS.1.16.5 Programme: Bachelor of Science with Chemistry and Physics /
Baccalaureus Scientiae met Chemie en Fisika**

NAS.1.16.5.1 Programme outcomes/ Program uitkomst

On completion of studies, the student will have the ability to integrate the basic knowledge and techniques of Physics and Mathematics in the curriculum he completed with a view to investigating phenomena in the nature relevant to the core subjects of the curriculum and solving relevant problems. /

Aan die einde van die studie is die student in staat om die basiese kennis en tegnieke van die kernvakke wat voltooi is, te integreer om verskynsels in die natuur wat met die kernvakke van die kurrikulum/program verband hou te ondersoek en gepaardgaande probleme op te los.

**NAS.1.16.5.2 Programme: Bachelor of Science with Chemistry and Physics /
Baccalaureus Scientiae met Chemie, en Fisika**

CODE/ KODE: 2FF H05-N301P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Mafikeng (ENGLISH)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	NCHE211	H	8	NCHE311	H	16
NCHE111	H	12	NCHE212	H	8	NCHE312	H	16
NPHY111	H	12	NPHY211	H	8	NPHY311	H	16
CMPG112(PC) OR APPM111**	X	12	NPHY212	H	8	NPHY312	H	16
MTHS111	X	12	APPM211	X	8			
			MTHS211	X	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	NCHE221	H	8	NCHE321	H	16
NCHE121	H	12	NCHE222	H	8	NCHE322	H	16
NPHY121	H	12	NPHY221	H	8	NPHY321	H	16
APPM122	X	12	NPHY222	H	8	NPHY322	H	16
MTHS121	X	12	APPM222	X	8			
			MTHS221 OR *MTHS223	X	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

Very important to note the following:

Students who wish to take either MTHS321 or MTHS311, must select MTHS221 as elective.

*The Physics Subject Group recommends MTHS223, although MTHS221 is also acceptable.

**APPM111 only on MC.

Baie belangrik om kennis te neem:

Studente wat MTHS321 en/of MTHS311 wil neem, moet MTHS221 as 'n keusemodule neem.

*Vakgroep Fisika beveel die module MTHS223 aan, hoewel MTHS221 ook aanvaarbaar is.

**NAS.1.16.5.2.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC
BSc in Physical and Chemical Sciences / BSc in Fisiese en Chemiese
Wetenskappe**

Curriculum / kurrikulum: Chemistry and Physics / *Chemie en Fisika*

CODE/ KODE: 200190

BSc in Physical and Chemical Sciences

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program N151P (3rd yrs/3^{de} jrs)*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLE/A111	X	12	CHEN211	H	8	CHEM311	H	16
CHEM111	H	12	CHEN212	H	8	CHEN312	H	16
FSKS111	H	12	FSKS211	H	8	FSKS311	H	16
ITRW112	X	12	FSKS212	H	8	FSKS312	H	16
WISN111	X	12	TGWN211	X	8			
			WISN211	X	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLE121	X	12	CHEN222	H	8	CHEN321	H	16
CHEM121	H	12	CHEN223	H	8	CHEN322	H	16
FSKS121	H	12	FSKS221	H	8	FSKS321	H	16
TGWN122	X	12	FSKS222	H	8	FSKS322	H	16
WISN121	X	12	TGWN223	X	8			
			WISN224	X	8			
			OR *WISN225					
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

**NAS.1.16.5.2.2 OLD PROGRAMME only senior students (PHASING OUT) MC:
BSc in Chemistry-Physics**

Curriculum: Chemistry and Physics

CODE: 200129

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N308M (3rd yrs)**

***Core modules are indicated with (H) and ancillary modules with (X)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	PHYM 315	H	8
MCHE 114	H	12	MCHE 215	H	8	PHYM 316	H	8
PHYM 118	H	12	MCHE 216	H	8	PHYM 317	H	8
MAYM 117	X	12	MAYM 217	X	16	PHYM 318	H	8
CISM 112	X	12	PHYM 215	H	8	MCHE 315	H	16
			PHYM 216	H	8	MCHE 316	H	16
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	PHYM 321	H	8
MCHE 121	H	12	MCHE 221	H	8	PHYM 322	H	8
PHYM 128	H	12	MCHE 223	X	8	PHYM 323	H	8
MAYM 127	X	12	MAYM 227	H	16	PHYM 324	H	8
CISM 124	X	12	PHYM 221	H	8	MCHE 321	H	16
			PHYM 222	H	8	MCHE 322	H	16
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.6 Programme: Bachelor of Science with Chemistry, Mathematics and Applied Mathematics / *Baccalaureus Scientiae met Chemie, Wiskunde en Toegepaste Wiskunde*

CODE/ KODE: 2FF H22 - N301P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program*

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	NCHE211	H	8	NCHE311	H	16
NCHE111	H	12	NCHE212	H	8	NCHE312	H	16
NPHY111	X	12	NPHY211	X	8	APPM312	H	16
STTN111	X	12	APPM211	H	8	MTHS312	H	16
MTHS111	H	12	MTHS211	H	8			
			MTHS212	H	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	NCHE221	H	8	NCHE321	H	16
NCHE121	H	12	NCHE222	H	8	NCHE322	H	16
NPHY121	X	12	NPHY221	X	8	APPM322	H	16
APPM122	H	12	APPM221	H	8	MTHS322	H	16
MTHS121	H	12	MTHS221	H	8			
			MTHS222	H	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.16.6.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC: BSc in Physical and Chemical Sciences / BSc in Fisiese en Chemiese Wetenskappe

Curriculum / kurrikulum: Chemistry, Mathematics and Applied Mathematics / *Chemie, Wiskunde en Toegepaste Wiskunde*

CODE/ KODE: 200190

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program N152P (3rd yrs/3^{de} jrs)*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLE/A111	X	12	CHEN211	H	8	CHEM311	H	16
CHEM111	H	12	CHEN212	H	8	CHEM312	H	16
FSKS111	X	12	FSKS211	X	8	TGWN312	H	16
STTN111	X	12	TGWN211	H	8	WISN312	H	16
WISN111	H	12	WISN211	H	8			
			WISN212	H	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLE121	X	12	CHEN222	H	8	CHEN321	H	16
CHEM121	H	12	CHEN223	H	8	CHEN322	H	16
FSKS121	X	12	FSKS222	X	8	TGWN322	H	16
TGWN122	H	12	TGWN223	H	8	WISN322	H	16
WISN121	H	12	WISN224	H	8			
			WISN226	H	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.16.7 Programme: Bachelor of Science with Applied Mathematics and Chemistry

CODE: 2FF H13 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme Applied Mathematics and Chemistry

NEW PROGRAMME (1st & 2nd yrs)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE111	X	12	APPM212	H	8	APPM311	H	16
APPM111	H	12	APPM213	H	8	APPM313	H	16
MTHS111	X	12	MTHS211	X	8	NCHE311	H	16
NCHE111	H	12	MTHS212	X	8	NCHE312	H	16
NPHY111	X	12	NCHE211	H	8			
			NCHE212	H	8			
			WVNS211	X	12			
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE122	X	12	APPM222	H	8	APPM322	H	16
APPM122	H	12	APPM223	H	8	APPM323	H	16
MTHS121	X	12	MTHS221	X	8	NCHE321	H	16
NCHE121	H	12	MTHS222	X	8	NCHE322	H	16
NPHY121	X	12	NCHE221	H	8			
			NCHE222	H	8			
			WVNS221	X	12			
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.7.1 OLD PROGRAMME only senior students (PHASING OUT) MC: BSc in Applied Mathematics - Chemistry

Curriculum: Applied Mathematics and Chemistry

CODE: 200169

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N112M (3rd yrs)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	APMM 317	H	16
APMM 117	H	12	APMM 217	H	16	APMM 318	H	16
MCHE 114	H	12	MCHE 215	H	8	MCHE 315	H	16
MAYM 117	X	12	MCHE 216	H	8	MCHE 316	H	16
PHYM 118	X	12	MAYM 217	X	16			
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	APMM 327	H	16
APMM 127	H	12	APMM 227	H	16	APMM 328	H	16
MCHE 121	H	12	MCHE 221	H	8	MCHE 321	H	16
MAYM 127	X	12	MCHE 223	H	8	MCHE 322	H	16
PHYM 128	X	12	MAYM 227	X	16			
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.8 Programme: Bachelor of Science with Chemistry and Mathematics

CODE: 2FF H11 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme Chemistry and Mathematics

NEW PROGRAMME (1st & 2nd yrs)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE111	X	12	NCHE211	H	8	NCHE311	H	16
NCHE111	H	12	NCHE212	H	8	NCHE312	H	16
MTHS111	H	12	MTHS211	H	8	MTHS311	H	16
CMPG111	X	12	MTHS212	H	8	MTHS312	H	16
NPHY111	X	12	NPHY211	X	8			
			NPHY212	X	8			
			WVNS211	X	12			
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE122	X	12	NCHE221	H	8	NCHE321	H	16
NCHE121	H	12	NCHE222	H	8	NCHE322	H	16
MTHS121	H	12	MTHS221	H	8	MTHS321	H	16
CMPG121	X	12	MTHS222	H	8	MTHS322	H	16
NPHY121	X	12	NPHY221	X	8			
			NPHY222	X	8			
			WVNS221	X	12			
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

**NAS.1.16.8.1 OLD PROGRAMME only senior students (PHASING OUT) MC:
BSc in Chemistry and Mathematics**

Curriculum: Chemistry and Mathematics

CODE: 200140

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N307M (3rd yrs)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	MAYM 317	H	16
MCHE 114	H	12	MCHE 215	H	8	MAYM 318	H	16
PHYM 118	X	12	MCHE 216	H	8	MCHE 315	H	16
MAYM 117	H	12	MAYM 217	H	16	MCHE 316	H	16
CISM 112 (X)	X	12	PHYM 215	X	8			
			PHYM 216	X	8			
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	MAYM 327	H	16
MCHE 121	H	12	MCHE 221	H	8	MAYM 328	H	16
PHYM 128	X	12	MCHE 223	H	8	MCHE 321	H	16
MAYM 127	H	12	MAYM 227	H	16	MCHE 322	H	16
CISM 124	X	12	PHYM 221	X	8			
			PHYM 222	X	8			
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

**NAS.1.16.9 Programme: Bachelor of Science with Biochemistry and Chemistry /
Baccalaureus Scientiae met Biochemie en Chemie**

CODE/ KODE: 2FF H06 - N301P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Mafikeng (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A	X	12	*FLGX213 or/of MKBN211	X	16	BCHS316	H	16
*FLGX113 or/of **NPHY111	X	12	BCHN213	H	16	BCHS317	H	16
MCBN111	H	12	NCHE211	H	8	NCHE311	H	16
MTHS114	X	12	NCHE212	H	8	NCHE312	H	16
NCHE111	H	12	WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	NCHE221	H	8	BCHS321	H	16
MCBN121	H	12	NCHE222	H	8	BCHS322	H	16
*FLGX123 or/of **NPHY121	X	12	BCHN222	H	16	NCHE321	H	16
MTHS124	X	12	*FLGX223 *FLGX224 or/of MKBS221	X X X	8 8 16	NCHE322	H	16
NCHE121	H	12	WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

*FLGX only for Potch students- not offered at Mafikeng campus.

** NPHY111/121 only for Mafikeng students.

NAS.1.16.9.1 OLD PROGRAMME only senior students (PHASING OUT) / OU PROGRAM (FASEER UIT) PC: BSc in Physical and Chemical Sciences / BSc in Fisiese en Chemiese Wetenskappe

Curriculum/ Kurrikulum: Biochemistry and Chemistry / *Biochemie en Chemie*

CODE/KODE: 200190: **CAMPUS/KAMPUS:** Potchefstroom (Afrikaans, English)

DELIVERY MODE/AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme/ *Samestelling van program N174P (3rd yrs/3^{de} jrs)*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
CHEM111	H	12	FLGX213	X	16	BCHS316	H	16
FLGX113	X	12	BCHN213	H	16	BCHS317	H	16
FSKS113	X	12	CHEN211	H	8	CHEN311	H	16
WISN111	X	12	CHEN212	H	8	CHEN312	H	16
AGLA/E111	X	12	WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLA/E121	X	12	CHEN222	H	8	BCHS321	H	16
CHEM121	H	12	CHEN223	H	8	BCHS322	H	16
FSKS123	X	12	BCHN222	H	16	CHEN321	H	16
FLGX123	X	12	FLGX223	X	8	CHEN322	H	16
WISN121	X	12	FLGX224	X	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.16.9.2 OLD PROGRAMME only senior students (PHASING OUT): MC BSc in Physical and Chemical Sciences

Curriculum: Biochemistry and Chemistry

CODE: 200190

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N174M (3rd yrs)**

***Core modules are indicated with (H) and ancillary modules with (X)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	BCHS 314	H	16
BGYM 113	H	12	MKBS 211	X	8	BCHS 315	H	16
MAYM 116	X	12	MKBS 212	X	8	MCHE 315	H	16
MCHE 114	H	12	MCHE 215	H	8	MCHE 316	H	16
PHYM 118	X	12	MCHE 216	H	8			
			BCHS 211	H	8			
			BCHS 212	H	8			
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
BGYM 123	H	12	WVNS 221	X	12	BCHS 324	H	16
PHYM 128	X	12	MKBS 223	X	8	BCHS 325	H	16
MAYM 126	X	12	MKBS 222	X	8	MCHE 321	H	16
AGLE 121	X	12	MCHE 221	H	8	MCHE 322	H	16
MCHE 121	H	12	MCHE 223	H	8			
			BCHS 221	H	8			
			BCHS 222	H	8			
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.10 OLD PROGRAMME only senior students (PHASING OUT): BSc in Biology and Chemistry

Curriculum: Biology and Chemistry

No new intake in this programme, with effect from 2018.

CODE: 200173

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme: **N301M (3rd yrs)**

***Core modules are indicated with (H) and ancillary modules with (X)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	BGYM 313	H	16
BGYM 113	H	12	BGYM 213	H	8	BGYM 314	H	16
MAYM 116	X	12	BGYM 214	H	8	MCHE 315	H	16
MCHE 114	H	12	MCHE 215	H	8	MCHE 316	H	16
PHYM 118	X	12	MCHE 216	H	8			
			PHYM 215	X	8			
			PHYM 216	X	8			
Total 1 st Semester		60	Total 1 st semester		60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
BGYM 123	H	12	WVNS 221	X	12	BGYM 326	H	32
MCHE 121	H	12	BGYM 227	H	8	MCHE 321	H	16
PHYM 128	X	12	BGYM 225	H	8	MCHE 322	H	16
MAYM 126	X	12	PHYM 221	X	8			
ALGE 121	X	12	PHYM 222	X	8			
			MCHE 221	H	8			
			MCHE 223	H	8			
Total 2 nd semester		60	Total 2 nd semester		60	Total 2 nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.11 **OLD PROGRAMME only senior students (PHASING OUT): BSc in Biology and Geography**

Curriculum: Biology and Geography

No new intake in this programme, with effect from 2018.

CODE: 200174: **CAMPUS:** MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N301M (3rd yrs)**

*Core modules are indicated with (H) and ancillary modules with (X)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	BGYM 316	H	16
CISM 112	X	12	BGYM 215	H	8	BGYM 315	H	16
MAYM 116	X	12	BGYM 216	H	8	GEOM 316	H	16
GEOM 113	H	12	GEOM 214	H	8	GEOM 317	H	16
BGYM 113	H	12	GEOM 215	H	8			
			CISM 213	X	8			
			CISM 214	X	8			
Total 1 st Semester		60	Total 1 st semester		60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 222	X	12	BGYM 326	H	32
CISM 122	X	12	BGYM 226	H	16	GEOM 328	H	16
MAYM 126	X	12	GEOM 224	H	8	GEOM 329	H	16
BGYM 123	H	12	GEOM 225	H	8			
GEOM 123	H	12	CISM 225	X	8			
			CISM 226	X	8			
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.12 Programme: Bachelor of Science with Physics and Mathematics / Baccalaureus Scientiae met Fisika en Wiskunde

*All students who wish to continue with an honours degree in Mathematics, must complete both WISN322 and WISN324 (2019 codes) in the second semester of the third year./

*Alle studente wat wil voortgaan met 'n honneursgraad in Wiskunde moet in die tweede semester van die derde jaar beide WISN322 en WISN324 (2019 codes) voltooi.

CODE/ KODE: 2FF H23-N301P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English); Mafikeng (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	NPHY211	H	8	NPHY311	H	16
NPHY111	H	12	NPHY212	H	8	NPHY312	H	16
CMPG111	X	12	APPM211	X	8	MTHS311	H	16
NCHE111 OR/OF STTN111* OR/OF APPM111**	X	12	APPM212	X	8	MTHS312	H	16
MTHS111	H	12	MTHS211	H	8			
			MTHS212	H	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	NPHY221	H	8	NPHY321	H	16
NPHY121	H	12	NPHY222	H	8	NPHY322	H	16
CMPG121	X	12	APPM221	X	8	MTHS321	H	16
APPM122	X	12	APPM222	X	8	MTHS322	H	16
MTHS121	H	12	MTHS221	H	8			
			MTHS222	H	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

*STTN111 Only available on PC

**APPM111 only available on MC.

**NAS.1.16.12.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
BSc in Physical and Chemical Sciences / BSc in Fisiese en Chemiese
Wetenskappe**

*All students who wish to continue with an honours degree in Mathematics, must complete both WISN322 and WISN324 in the second semester of the third year./

*Alle studente wat wil voortgaan met 'n honneursgraad in Wiskunde moet in die tweede semester van die derde jaar beide WISN322 en WISN324 voltooi.

Curriculum / Kurrikulum: Physics and Mathematics / Fisika en Wiskunde

CODE/ KODE: 200190: CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program **N154P (3rd yrs/ 3^{de} jrs)**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLA/E111	X	12	FSKS211	H	8	FSKS311	H	16
FSKS111	H	12	FSKS212	H	8	FSKS312	H	16
ITRW115	X	12	TGWN211	X	8	WISN312	H	16
CHEM111 OR/ OF STTN111	X	12	TGWN213	X	8	WISN314	H	16
WISN111	H	12	WISN211	H	8			
			WISN212	H	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLA/E121	X	12	FSKS221	H	8	FSKS321	H	16
FSKS121	H	12	FSKS222	H	8	FSKS322	H	16
ITRW124	X	12	TGWN221	X	8	WISN324 OR/ OF FSKS323	H	16
TGWN122	X	12	TGWN223	X	8	WISN322	H	16
WISN121	H	12	WISN224	H	8			
			WISN226	H	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.16.12.2 OLD PROGRAMME only senior students (PHASING OUT) MC: BSc in Mathematics and Physics

Curriculum: Mathematics and Physics

CODE: 200134

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N311M (3rd yrs / 3^{de} jrs)**

***Core modules are indicated with (H) and ancillary modules with (X)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	MAYM 317	H	16
ELYM 115	X	12	ELYM 215	X	16	MAYM 318	H	16
PHYM 118	H	12	PHYM 215	H	8	PHYM 315	H	8
MAYM 117	X	12	PHYM 216	H	8	PHYM 316	H	8
CISM 112	X	12	MAYM 217	H	16	PHYM 317	H	8
						PHYM 318	H	8
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	MAYM 327	H	16
ELYM 127	X	12	ELYM 227	X	16	MAYM 328	H	16
PHYM 128	H	12	PHYM 221	H	8	PHYM 321	H	8
MAYM 127	H	12	PHYM 222	H	8	PHYM 322	H	8
CISM 124	X	12	MAYM 227	H	16	PHYM 323	H	8
						PHYM 324	H	8
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

**NAS.1.16.13 Programme: Bachelor of Science with Physics and APPLIED Mathematics
/ Baccalaureus Scientiae met Fisika en TOEGEPASTE Wiskunde**

NAS.1.16.13.1 Programme outcomes/ Program uitkomst

*All students who wish to continue with an honours degree in Applied Mathematics, must complete two of the three modules in the second semester of the third year. APPM321 Dynamical Systems, APPM322 Optimisation and APPM323 Fluid Mechanics. Please note that the module APPM323 Fluid Mechanics will only be presented on the Potchefstroom campus if there is sufficient interest, and if capacity allows it. Please consult the subject group Mathematics and Applied Mathematics for advice in this regard./

**Alle studente wat wil voortgaan met 'n honneursgraad in Toegepaste Wiskunde moet in die tweede semester van die derde jaar ten minste twee van die drie modules APPM321 Dinamiese Stelsels, APPM322 Optimalisering en APPM323 Vloeimeganika voltooi. Let asseblief daarop dat die module APPM323* Vloeimeganika slegs op die Potchefstroom kampus aangebied sal word indien daar voldoende belangstelling is en kapasiteit dit toelaat. Raadpleeg asseblief die vakgroep Wiskunde en Toegepaste Wiskunde vir advies in die verband.*

**NAS.1.16.13.2 Bachelor of Science with Physics and APPLIED Mathematics /
Baccalaureus Scientiae met Fisika en TOEGEPASTE Wiskunde**

CODE/ KODE: 2FF H24 - N301P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English); Mafikeng(English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDYS

Compilation of programme / Samestelling van program

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	NPHY211	H	8	NPHY311	H	16
CMPG111	X	12	NPHY212	H	8	NPHY312	H	16
NPHY111	H	12	APPM211	H	8	APPM311	H	16
MTHS111	X	12	APPM212	H	8	APPM312(PC) APPM313**	H	16
NCHE111 or/of STTN111* or/of APPM111**	X X H	12	MTHS211	X	8			
			MTHS212	X	8			
			WVNS211	X	12			
Total / Totaal 1st semester		60	Total / Totaal 1st semester		60	Total / Totaal 1st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	NPHY221	H	8	NPHY321	H	16
NPHY121	H	12	NPHY222	H	8	NPHY322	H	16
CMPG121	X	12	APPM221	H	8	Choose 2 of the following modules / Kies 2 van die volgende modules		
APPM122	H	12	APPM222	H	8			
MTHS121	X	12	MTHS221	X	8			
			MTHS222*** or/of MTHS224	X	8		APPM321**	H
			WVNS221	X	12	or/of APPM322	H	16
						or/of APPM323**	H	16
Total / Totaal 2nd semester		60	Total / Totaal 2nd semester		60	Total / Totaal 2nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

*STTN111 only offered on PC/ Slegs op PC beskikbaar

**APPM111/313/321/323 only offered on MC / Slegs op MC beskikbaar

*** Students who wish to take, MTHS322 must select MTHS222 as elective./ Studente wat MTHS322 wil neem, moet MTHS222 as keusemodule neem.

**NAS.1.16.13.3 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
BSc in Physical and Chemical Sciences / BSc in Fisiese en Chemiese Wetenskappe**

Curriculum / Kurrikulum: Physics and Applied Mathematics / *Fisika en Toegepaste Wiskunde*

CODE/ KODE: 200190

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDYS

Compilation of programme / *Samestelling van program N155P (3rd yrs)*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLE/A111	X	12	FSKS211	H	8	FSKS311	H	16
FSKS111	H	12	FSKS212	H	8	FSKS312	H	16
ITRW115	X	12	TGWN211	H	8	TGWN311	H	16
CHEM111 OR/OF STTN111	X	12	TGWN213	H	8	TGWN312	H	16
WISN111	H	12	WISN211	X	8			
			WISN212	X	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLE/A121	X	12	FSKS221	H	8	FSKS321	H	16
FSKS121	H	12	FSKS222	H	8	FSKS322	H	16
ITRW124	X	12	TGWN221	H	8	TGWN323 OR/OF FSKS323	H	16
TGWN122	H	12	TGWN223	H	8	TGWN322	H	16
WISN121	H	12	WISN224	X	8			
			*WISN226 OR/OF WISN227	X	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.16.13.4 OLD PROGRAMME only senior students (PHASING OUT) MC: BSc in Applied Mathematics and Physics

Curriculum: Applied Mathematics and Physics

CODE: 200152

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N304M (3rd yrs)**

***Core modules are indicated with (H) and ancillary modules with (X)**

First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	APMM 317	H	16
APMM 117	H	12	APMM 217	H	16	APMM 318	H	16
PHYM 118	H	12	PHYM 215	H	8	PHYM 315	H	8
MAYM 117	X	12	PHYM 216	H	8	PHYM 316	H	8
CISM 112	X	12	MAYM 217	X	16	PHYM 317	H	8
						PHYM 318	H	8
Total 1 st Semester		60	Total 1 st semester		60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	APMM 327	H	16
APMM 127	H	12	APMM 227	H	16	APMM 328	H	16
PHYM 128	H	12	PHYM 221	H	8	PHYM 321	H	8
MAYM 127	X	12	PHYM 222	H	8	PHYM 322	H	8
CISM 124	X	12	MAYM 227	X	16	PHYM 323	H	8
						PHYM 324	H	8
Total 2 nd semester		60	Total 2 nd semester		60	Total 2 nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.14 Programme: Bachelor of Science with Applied Mathematics and Electronics

CODE: 2FF H14 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme: Applied Mathematics and Electronics

NEW PROGRAMME (1st & 2nd yrs)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE111	X	12	APPM212	H	8	APPM311	H	16
APPM111	H	12	APPM213	H	8	APPM313	H	16
CMPG111	X	12	MTHS211	X	8	ELYM315	H	16
MTHS111	X	12	MTHS212	X	8	ELYM316	H	16
ELYM115	H	12	ELYM215	H	16			
			WVNS211	X	12			
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE122	X	12	APPM222	H	8	APPM322	H	16
APPM122	H	12	APPM223	H	8	APPM323	H	16
CMPG121	X	12	MTHS221	X	8	ELYM327	H	16
MTHS121	X	12	MTHS222	X	8	ELYM328	H	16
ELYM127	H	12	ELYM227	H	16			
			WVNS221	X	12			
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.14.1 OLD PROGRAMME only senior students (PHASING OUT) MC: BSc in Applied Mathematics and Electronics

Curriculum: Applied Mathematics and Electronics

CODE: 200171

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme N114M (3rd yrs)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	APMM 317	H	16
APMM 117	H	12	APMM 217	H	16	APMM 318	H	16
MAYM 117	X	12	MAYM 217	X	16	ELYM 315	H	16
ELYM 115	H	12	ELYM 215	H	16	ELYM 316	H	16
CISM 112	X	12						
Total 1 st Semester		60	Total 1 st semester		60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	APMM 327	H	16
APMM 127	H	12	APMM 227	H	16	APMM 328	H	16
MAYM 127	X	12	MAYM 227	X	16	ELYM 325	H	16
ELYM 127	H	12	ELYM 227	H	16	ELYM 326	H	16
CISM 124	X	12						
Total 2 nd semester		60	Total 2 nd semester		60	Total 2 nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.15 Programme: Bachelor of Science with Electronics and Mathematics

CODE: 2FF H19 - N301M

CAMPUS: Mafikeng (English)

DELIVERY MODE: FULL TIME

Compilation of programme Electronics and Mathematics

NEW PROGRAMME (1st & 2nd yrs)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE111	X	12	APPM212	X	8	MTHS311	H	16
APPM111	X	12	APPM213	X	8	MTHS312	H	16
ELYM115	H	12	ELYM215	H	16	ELYM315	H	16
CMPG111	X	12	MTHS211	H	8	ELYM316	H	16
MTHS111	H	12	MTHS212	H	8			
			WVNS211	X	12			
Total 1 st Semester		60	Total 1 st semester		60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE122	X	12	APPM222	X	8	MTHS321	H	16
APPM122	X	12	APPM223	X	8	MTHS322	H	16
ELYM127	H	12	ELYM227	H	16	ELYM327	H	16
CMPG121	X	12	MTHS221	H	8	ELYM328	H	16
MTHS121	H	12	MTHS222	H	8			
			WVNS221	X	12			
Total 2 nd semester		60	Total 2 nd semester		60	Total 2 nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.15.1 OLD PROGRAMME only senior students (PHASING OUT) MC: BSc in Electronics and Mathematics

Curriculum: Electronics and Mathematics

CODE: 200179

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N309M (3rd yrs)**

***Core modules are indicated with (H) and ancillary modules with (X)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	MAYM 317	H	16
ELYM 115	H	12	ELYM 215	H	16	MAYM 318	H	16
APMM 117	X	12	APMM 217	X	16	ELYM 315	H	16
MAYM 117	H	12	MAYM 217	H	16	ELYM 316	H	16
CISM 112	X	12						
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	MAYM 327	H	16
ELYM 127	H	12	ELYM 227	H	16	MAYM 328	H	16
APMM 127	X	12	APMM 227	X	16	ELYM 327	H	16
MAYM 127	H	12	MAYM 227	H	16	ELYM 328	H	16
CISM 124	X	12						
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.16 Programme: Bachelor of Science with Electronics and Physics

CODE: 2FF H20 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme

NEW PROGRAMME (1st & 2nd yrs)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE111	X	12	ELYM215	H	16	ELYM315	H	16
ELYM115	H	12	MTHS211	X	8	ELYM316	H	16
MTHS111	X	12	MTHS212	X	8	NPHY311	H	16
CPMG111	X	12	NPHY211	H	8	NPHY312	H	16
NPHY111	H	12	NPHY212	H	8			
			WVNS211	X	12			
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE122	X	12	ELYM227	H	16	ELYM327	H	16
ELYM127	H	12	MTHS221	X	8	ELYM328	H	16
MTHS121	X	12	MTHS222	X	8	NPHY321	H	16
CPMG121	X	12	NPHY221	H	8	NPHY322	H	16
NPHY121	H	12	NPHY222	H	8			
			WVNS221	X	12			
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.16.1 OLD PROGRAMME only senior students (PHASING OUT) MC: BSc in Electronics and Physics

Curriculum: Electronics and Physics

CODE: 200180:

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N310M (3rd yrs)**

***Core modules are indicated with (H) and ancillary modules with (X)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	PHYM 315	H	8
ELYM 115	H	12	ELYM 215	H	16	PHYM 316	H	8
PHYM 118	H	12	PHYM 215	H	8	PHYM 317	H	8
MAYM 117	X	12	PHYM 216	H	8	PHYM 318	H	8
CISM 112	X	12	MAYM 217	X	16	ELYM 315	H	16
						ELYM 316	H	16
Total 1 st Semester		60	Total 1 st semester		60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	PHYM 321	H	8
ELYM 127	H	12	ELYM 227	H	16	PHYM 322	H	8
PHYM 128	H	12	PHYM 221	H	8	PHYM 323	H	8
MAYM 127	X	12	PHYM 222	H	8	PHYM 324	H	8
CISM 124	X	12	MAYM 227	X	16	ELYM 327	H	16
						ELYM 328	H	16
Total 2 nd semester		60	Total 2 nd semester		60	Total 2 nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.17 Programme: Bachelor of Science with Physics and Computer Science / Baccalaureus Scientiae met Fisika en Rekenaarwetenskap

NAS.1.16.17.1 Faculty-specific rules for the programme / Fakulteitspesifieke reëls vir die program

- *CMPG222 and **CMPG224 are campus electives - PC does 222* and MC does **224
- *CMPG315 and *CMPG313 are electives on PC, but MC should take **CMPG313 In the second semester of the third year PC does advanced DB (*CMPG321) and MC does Networks (**CMPG325)
- *STTN111 only available on PC and **NCHE111/121 only available on MC
- ***Students who wish to take, MTHS322 must select MTHS222 as elective

CODE/ KODE: 2FF H25-N301P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Mafikeng (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	CMPG211	H	16	CMPG311	H	16
CMPG111	H	12	MTHS211	X	8	CMPG313**/ CMPG315*	H	16
MTHS111	X	12	MTHS212	X	8	NPHY311	H	16
STTN111* OR/OF NCHE111**	X	12	NPHY211	H	8	NPHY312	H	16
NPHY111	H	12	NPHY212	H	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	APPM222	X	8	CMPG321*/ CMPG325**	H	16
CMPG121	H	12	CMPG221	H	8	CMPG324	H	16
MTHS121	X	12	CMPG222*/ CMPG224**	H	8	NPHY321	H	16
APPM122 OR/OF NCHE121**	X	12	MTHS222*** OR/OF MTHS224	X	8	NPHY322	H	16
NPHY121	H	12	NPHY221	H	8			
			NPHY222	H	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

**NAS.1.16.17.2 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
BSc in Computer and Mathematical Sciences / BSc in Rekenaar- en
Wiskundige Wetenskappe**

Curriculum / *kurrikulum*: Physics and Computer Science / *Fisika en Rekenaarwetenskap*

CODE/ KODE: 200191

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program N153P (3rd yrs / 3^{de} jrs)*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW112	H	12	ITRW212	H	16	ITRW311	H	16
WISN111	X	12	WISN211	X	8	ITRW316	H	16
STTN111	X	12	WISN212	X	8	FSKS311	H	16
FSKS111	H	12	FSKS211	H	8	FSKS312	H	16
AGLA111	X	12	FSKS212	H	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW124	H	12	ITRW222	H	16	ITRW321	H	16
WISN121	X	12	TGWN223	X	8	ITRW322	H	16
TGWN122	X	12	*WISN226 OR/OF WISN227	X	8	FSKS321	H	16
FSKS121	H	12	FSKS221	H	8	FSKS322	H	16
AGLA121	X	12	FSKS222	H	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.16.17.3 OLD PROGRAMME only senior students (PHASING OUT) MC: BSc in Computer Science and Physics

Curriculum: Computer Science and Physics

CODE: 200132

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N128M: (3rd yrs)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	CISM 313	H	16
CISM 112	H	12	CISM 213	H	8	CISM 314	H	16
PHYM 118	H	12	CISM 214	H	8	PHYM 315	H	8
MAYM 117	X	12	PHYM 215	H	8	PHYM 316	H	8
MCHE 114	X	12	PHYM 216	H	8	PHYM 317	H	8
			MAYM 217	X	16	PHYM 318	H	8
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	CISM 326	H	16
CISM 122	H	12	CISM 225	H	8	CISM 327	H	16
PHYM 128	H	12	CISM 226	H	8	PHYM 321	H	8
MAYM 127	X	12	PHYM 221	H	8	PHYM 322	H	8
MCHE 121	X	12	PHYM 222	H	8	PHYM 323	H	8
			MAYM 227	X	16	PHYM 324	H	8
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.18 Programme: Bachelor of Science with Chemistry and Computer Science

CODE: 2FF H31 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st & 2nd yrs)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE111	X	12	MTHS211	X	8	CMPG311	H	16
NCHE111	H	12	MTHS212	X	8	CMPG313	H	16
MTHS111	X	12	CMPG211	H	16	NCHE311	H	16
CMPG111	H	12	NCHE211	H	8	NCHE312	H	16
NPHY111	X	12	NCHE212	H	8			
			WVNS211	X	12			
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE122	X	12	NCHE221	H	8	CMPG324	H	16
NCHE121	H	12	NCHE222	H	8	CMPG325	H	16
MTHS121	X	12	CMPG221	H	8	NCHE321	H	16
CMPG121	H	12	CMPG224	H	8	NCHE322	H	16
NPHY121	X	12	MTHS221	X	8			
			MTHS222	X	8			
			WVNS221	X	12			
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.18.1 OLD PROGRAMME only senior students (PHASING OUT) PC: BSc in Chemistry and Computer Science

Curriculum: Chemistry and Computer Science

CODE: 200130

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme: **N120M (3rd yrs)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	MCHE 315	H	16
CISM 112	H	12	CISM 213	H	8	MCHE 316	H	16
MAYM 117	X	12	CISM 214	H	8	CISM 313	H	16
MCHE 114	H	12	MAYM 217	X	16	CISM 314	H	16
PHYM 118	X	12	MCHE 215	H	8			
			MCHE 216	H	8			
Total 1 st Semester		60	Total 1 st semester		60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	MCHE 321	H	16
CISM 122	H	12	CISM 225	H	8	MCHE 322	H	16
MAYM 127	X	12	CISM 226	H	8	CISM 326	H	16
MCHE 121	H	12	MAYM 227	X	16	CISM 327	H	16
PHYM 128	X	12	MCHE 221	H	8			
			MCHE 223	H	8			
Total 2 nd semester		60	Total 2 nd semester		60	Total 2 nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.16.19 Programme: Bachelor of Science with Computer Science and Electronics

CODE: 2FF H17 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st & 2nd yrs)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE111	X	12	CMPG211	H	16	CMPG311	H	16
ELYM115	H	12	ELYM215	H	16	CMPG313	H	16
MTHS111	X	12	MTHS211	X	8	ELYM315	H	16
CMPG111	H	12	MTHS212	X	8	ELYM316	H	16
NPHY111	X	12	WVNS211	X	12			
Total 1 st Semester		60	Total 1 st semester		60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE122	X	12	CMPG221	H	8	CMPG324	H	16
ELYM127	H	12	CMPG224	H	8	CMPG325	H	16
MTHS121	X	12	ELYM227	H	16	ELYM325	H	16
CMPG121	H	12	MTHS221	X	8	ELYM327	H	16
NPHY121	X	12	MTHS222	X	8			
			WVNS221	X	12			
Total 2 nd semester		60	Total 2 nd semester		60	Total 2 nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

**NAS.1.16.19.1 OLD PROGRAMME only senior students (PHASING OUT) MC:
BSc in Computer Science and Electronics**

Curriculum: Computer Science and Electronics

CODE: 200177:

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme: **N125M (3rd yrs)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	CISM 313	H	16
CISM 112	H	12	CISM 213	H	8	CISM 314	H	16
ELYM 115	X	12	CISM 214	H	8	ELYM 315	H	16
MAYM 117	H	12	ELYM 215	H	16	ELYM 316	H	16
PHYM 118	X	12	MAYM217	X	16			
Total 1 st Semester		60	Total 1 st semester		60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	CISM 326	H	16
CISM 122	H	12	CISM 225	H	8	CISM 327	H	16
	X	12	CISM 226	H	8	ELYM 327	H	16
ELYM 127	H	12	ELYM 227	H	16	ELYM 328	H	16
MAYM 127	X	12	MAYM 227	X	16			
PHYM 128								
Total 2 nd semester		60	Total 2 nd semester		60	Total 2 nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

**NAS.1.16.20 Programme: Bachelor of Science with Computer Science and Statistics /
Baccalaureus Scientiae met Rekenaarwetenskap en Statistiek**

CODE/ KODE: 2FF H26 - N301P; N301V

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Vaaltriangle (English see NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
CMPG111	H	12	CMPG211	H	16	CMPG311	H	16
STTN115	H	12	STTN215	H	16	CMPG315	H	16
MTHS111	X	12	MTHS211	X	8	STTN316	H	24
NPHY111* ECON112**	X	12	MTHS212	X	8	STTN317	H	8
ALDE/A111	X	12	WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
CMPG121	H	12	CMPG221	H	8	CMPG321	H	16
STTN125	H	12	CMPG222	H	8	CMPG324	H	16
MTHS121	X	12	STTN225	H	16	STTN326	H	16
APPM122* ECON122**	X	12	MTHS221	X	8	STTN327	H	16
ALDE/A122	X	12	MTHS222	X	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

*Can only be taken on Potchefstroom campus / * Kan slegs by Potchefstroomkampus geneem word.

**Can only be taken on Vaaltriangle campus / ** Kan slegs by die Vaaldriekhoekampus geneem word.

NAS.1.16.20.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT)
PC/VTC: Bachelor of Science in Computer and Mathematical Science /
Baccalaureus Scientiae in Rekenaarwetenskap en Wiskundige
Wetenskappe

Curriculum / kurrikulum : Computer Science and Statistics / *Rekenaarwetenskap en Statistiek*

CODE/ KODE: 200191

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Vaaltriangle (English see NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program* **N156P; N156V (3rd yrs/ 3^{de} jrs)**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW112	H	12	ITRW212	H	16	ITRW311	H	16
STTN115	H	12	STTN215	H	16	ITRW316	H	16
WISN111	X	12	WISN211	X	8	STTN316	H	24
FSKS111	X	12	WISN212	X	8	STTN317		8
AGLA111	X	12	WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW124	H	12	ITRW222	H	16	ITRW321	H	16
STTN125	H	12	STTN225	H	16	ITRW322	H	16
WISN121	X	12	WISN224	X	8	STTN326	H	16
TGWN122	X	12	WISN226	X	8	STTN327	H	16
AGLA121	X	12	WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.16.21 Programme: Bachelor of Science with Computer Science and Mathematics / Baccalaureus Scientiae met Rekenaarwetenskap en Wiskunde

CODE/ KODE: 2FF H09 - N301P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Mafikeng (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

- *STTN115/125 and STTN215/225 only PC / slegs PK
- **APPM111, NPHY121 and **APPM212/213 and APPM222/223 only MC/ Slegs MK
- *CMPG222 only/slegs PC/PK and **CMPG224 only/slegs MC/MK
- *CMPG315 only/slegs PC, but MC should take **CMPG313. / CMPG313/315 is keusemodules op PC, maar MC moet CMPG313 neem.
- In the 2nd semester of the 3rd yr PC does CMPG321 and MC does CMPG325. / In die 2de semester van die 3de jr, doen PK CMPG321 en MK doen CMPG325.

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
CMPG111	H	12	CMPG211	H	16	CMPG311	H	16
STTN115* OR/OF APPM111**	X	12	STTN215* OR/OF APPM212** & APPM213**	X	16 8 8	CMPG313** OR/OF CMPG315*	H	16
MTHS111	H	12	MTHS211	H	8	MTHS311	H	16
NPHY111	X	12	MTHS212	H	8	MTHS312	H	16
ALDE/A111	X	12	WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
APPM122	H	12	CMPG221	H	8	CMPG324	H	16
CMPG121	H	12	CMPG222* OR/OF CMPG224**	H	8 8	CMPG321* OR/OF CMPG325**	H	16
MTHS121	H	12	MTHS221	H	8	MTHS321	H	16
			MTHS222	H	8	MTHS322	H	16
STTN125* OR/OF NPHY121**	X	12	STTN225* OR/OF APPM222** & APPM223**	X	16 8 8			
ALDE/A122	X	12	WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.16.21.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
BSc in Computer and Mathematical Sciences / BSc in Rekenaar- en
Wiskundige Wetenskappe

CURRICULUM / KURRIKULUM: COMPUTER SCIENCE AND MATHEMATICS /
 REKENAARWETENSKAP EN WISKUNDE

CODE/ KODE: 200191

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program: **N157P (3rd yrs)**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW112	H	12	ITRW212	H	16	ITRW311	H	16
WISN111	H	12	WISN211	H	8	ITRW316	H	16
STTN115	X	12	WISN212	H	8	WISN314	H	16
FSKS111	X	12	STTN215	X	16	WISN312	H	16
AGLE111	X	12	WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW124	H	12	ITRW222	H	16	ITRW321	H	16
WISN121	H	12	WISN224	H	8	ITRW322	H	16
STTN125	X	12	WISN226	H	8	WISN324	H	16
TGWN122	H	12	STTN225	X	16	WISN322	H	16
AGLE121	X	12	WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.16.21.2 OLD PROGRAMME only senior students (PHASING OUT) MC: BSc in Computer Science and Mathematics

CURRICULUM: COMPUTER SCIENCE AND MATHEMATICS

CODE: 200137

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme: **N127M (3rd yrs)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	CISM 313	H	16
CISM 112	H	12	CISM 213	H	8	CISM 314	H	16
PHYM 118	X	12	CISM 214	H	8	MAYM 317	H	16
MAYM 117	H	12	MAYM 217	H	16	MAYM 318	H	16
APMM 117	X	12	APMM 217	X	16			
Total 1 st Semester		60	Total 1 st semester		60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	CISM 326	H	16
CISM 122	H	12	CISM 225	H	8	CISM 327	H	16
MAYM 127	H	12	CISM 226	H	8	MAYM 327	H	16
APMM 127	X	12	MAYM 227	H	16	MAYM 328	H	16
PHYM 128	X	12	APMM 227	X	16			
Total 2 nd semester		60	Total 2 nd semester		60	Total 2 nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

**NAS.1.16.22 Programme: Bachelor of Science with Computer Science and Economics
/ Baccalaureus Scientiae met Rekenaarwetenskap en Ekonomie**

CODE/ KODE: 2FF H28 - N301P; N301V

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Vaaltriangle (English, see NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1st & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	ECON211	H	16	ECON313*	H	16
CMPG111	H	12	CMPG211	H	16	ECON314*	H	16
MTHS111	X	12	MTHS211	X	8	CMPG311	H	16
ECON112	H	12	MTHS212	X	8	CMPG315	H	16
ACCF111 OR/OF ACCS111	X	16	WVNS211	X	12			
Total / Totaal 1 st semester		64	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	ECON221	H	16	ECON322*	H	16
CMPG121	H	12	CMPG221	H	8	ECON325*	H	16
MTHS121	X	12	CMPG222	H	8	CMPG321	H	16
ECON122	H	12	MTHS221	X	8	CMPG324	H	16
ACCF121 OR/OF ACCS121	X	16	MTHS222	X	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		64	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		128	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								376

*Please note that as of 2020, the package of modules ECON313, ECON314, ECON322 and ECON325 will be a prerequisite for Honours studies in Economics.

That means that students registered for this degree need to already do these modules in 2019 to going on to Honours in Economics. / Neem kennis dat vanaf 2020, die volgende modules as voorvereistes vir die Honeursstudie in Ekonomie sal wees: ECON313, ECON314, ECON322 en ECON325

**NAS.1.16.22.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT)
PC/NTC: BSc in Computer and Mathematical Sciences/ BSc in Rekenaar-
en Wiskundige Wetenskappe**

Curriculum / kurrikulum: Computer Science and Economics / *Rekenaarwetenskap en
Ekonomie*

CODE/ KODE: 200191 - N175P; N175V

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Vaaltriangle (English see NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program* **N175P; N175V (3rd yrs)**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW112	H	12	ECON211	H	16	EKRP311	H	16
WISN111	X	12	ITRW212	H	16	ECON311	H	16
ECON111	H	12	WISN211	X	8	ITRW311	H	16
ACCF111 OF ACCS111	X	16	WISN212	X	8	ITRW316	H	16
AGLA111	X	12	WVNS211	X	12			
Total / Totaal 1 st semester		64	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW124	H	12	ECON221	H	16	EKRP321	H	16
WISN121	X	12	ITRW222	H	16	ECON321	H	16
ECON121	H	12	WISN224	X	8	ITRW321	H	16
ACCF121 OF ACCS121	X	16	WISN226	X	8	ITRW322	H	16
AGLA121	X	12	WVNS221	X	12			
Total / Totaal 2 nd semester		64	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		128	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								376

**NAS.1.16.23 Programme: Bachelor of Science with Mathematics and Economics /
Baccalaureus Scientiae met Wiskunde en Ekonomie**

CODE/ KODE: 2FF H29 - N301P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	ECON211	H	16	ECON313*	H	16
CMPG111	X	12	CMPG211	X	16	ECON314*	H	16
MTHS111	H	12	MTHS211	H	8	MTHS311	H	16
ECON112	H	12	MTHS212	H	8	MTHS312	H	16
ACCF111 OR/OF ACCS111	X	16	WVNS211	X	12			
Total / Totaal 1 st semester		64	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	ECON221	H	16	ECON322*	H	16
CMPG121	X	12	CMPG221 OR/OF APPM222	X	8	ECON325*	H	16
MTHS121	H	12	CMPG222	X	8	MTHS321	H	16
ECON122	H	12	MTHS221	H	8	MTHS322	H	16
ACCF121 OR/OF ACCS121	X	16	MTHS222	H	8			
			WVNS221	X	12			
		64			60			64
Total year level / Totaal jaarvlak 1		128	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								376

*Please note that as of 2020, the package of modules ECON313, ECON314, ECON322 and ECON325 will be a prerequisite for Honours studies in Economics.

That means that students registered for this degree need to already do these modules in 2019 to going on to Honours in Economics. / Neem kennis dat vanaf 2020, die volgende modules as voorvereistes vir die Honeursstudie in Ekonomie sal wees: ECON313, ECON314, ECON322 en ECON325

**NAS.1.16.23.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC.
BSc in Computer and Mathematical Sciences/ BSc in Rekenaar- en
Wiskundige Wetenskappe**

Curriculum / kurrikulum: Mathematics and Economics / *Wiskunde en Ekonomie*

CODE/ KODE: 200191: N176P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:* **N176P (3rd yrs)**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW112	X	12	ECON211	H	16	ECON311	H	16
WISN111	H	12	ITRW212	X	16	TGWN312	H	16
ECON111	H	12	WISN211	H	8	WISN314	H	16
ACCF111	X	16	WISN212	H	8	WISN312	H	16
OR/OF ACCS111								
AGLE/A111	X	12	WVNS211	X	12			
Total / Totaal 1st semester		64	Total / Totaal 1st semester		60	Total / Totaal 1st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW124	X	12	ECON211	H	16	ECON321	H	16
WISN121	H	12	ITRW222	X	16	TGWN322	H	16
ECON121	H	12	WISN224	H	8	WISN324	H	16
ACCF121	X	16	WISN226	H	8	WISN322	H	16
OR/OF ACCS121								
AGLE/A121	X	12	WVNS221	X	12			
Total / Totaal 2nd semester		64	Total / Totaal 2nd semester		60	Total / Totaal 2nd semester		64
Total year level / Totaal jaarvlak 1		128	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								376

NAS.1.16.24 Programme: Bachelor of Science with Geography and Applied Mathematics / Baccalaureus Scientiae met Geografie en Toegepaste Wiskunde

CODE/ KODE: 2FF-H30 - N301P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	APPM212	H	8	APPM311	H	16
CMPG115	X	12	GEOG211	H	16	APPM312	H	16
GEOG111	H	12	GEOG212	H	8	GEOG311	H	32
NPHY111	X	12	MTHS211	X	8			
MTHS111	X	12	MTHS212	X	8			
			WVNS211	X	12			
Total / Totaal 1st semester		60	Total / Totaal 1st semester		60	Total / Totaal 1st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A121	X	12	APPM222	H	8	APPM321	H	16
GEOG121	H	12	GEOG221	H	16	APPM322	H	16
NPHY121	X	12	NPHY222	X	8	GEOG321	H	32
MTHS121	X	12	MTHS223	X	8			
STTN122	X	12	MTHS224	X	8			
			WVNS221	X	12			
Total / Totaal 2nd semester		60	Total / Totaal 2nd semester		60	Total / Totaal 2nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.17 PROGRAMME: BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY / BACCALAUREUS SCIENTIAE IN INLIGTINGSTEGNOLOGIE

NAS.1.17.1 IT Distance Learning now available / IT Afstandsonderrig nou beskikbaar:

The NWU's Faculty of Natural and Agricultural Sciences will be offering our three (3) year BSc Computer Science and Information Technology degree in the form of distance learning from 2018. This mode of delivery is only available at the Potchefstroom campus. This degree is equivalent to the three year BSc Computer Science and Information Technology degree offered by the faculty on the NWU Potchefstroom and Vaal Triangle Campus. **Students are not allowed to switch between semesters from full-time to distance or from distance to full-time.**

Take note: capacity for distance learning is limited. /

Die NWU se Fakulteit Natuur- en Landbouwetenskappe bied vanaf 2018 die drie (3) jaar BSc Rekenaarwetenskap en Inligtingstegnologie-graad aan in die vorm van afstandsl eer. Hierdie metode van aflewering, is egter slegs by die Potchefstroomkampus beskikbaar.

*Hierdie graad is gelykstaande aan die driejarige BSc Rekenaarwetenskap- en Inligtingstegnologie-graad wat deur die fakulteit op die NWU Potchefstroom- en Vaaldriehoekkampus aangebied word. **Stude nte word nie toegelaat om tussen semesters van voltyds na afstand of van afstand na voltyds oor te skakel nie.***

Neem kennis: kapasiteit vir afstandsl eer is beperk.

NAS.1.17.1.1 What are the minimum requirements for BSc IT distance learning? / Wat is die minimum vereistes vir BSc IT afstandsonderrig?

- Specific Requirements / *Spesifieke Vereistes:*
 - Basic Computer Literacy
 - Access to a computer or laptop with a Microsoft Windows 7, 8 or 10 operating system, including access to the Internet from the computer or laptop with an Internet speed of at least 2Mbps.
 - Microsoft Office 2016 or Office 365. Registered students of the NWU will be able to install Office 365 ProPlus for free.
 - It is **COMPULSORY**, and the responsibility of the student to obtain the necessary technology such as a computer and mobile phone that meet the minimum specifications of the NWU namely: Wi-Fi enabled, Windows-, Android- or Apple operating system, 3G enabled (preferably) and 32 Gig (preferably) /
 - *Basiese Rekenaargeletterdheid*
 - *Toegang tot 'n rekenaar of skootrekenaar met 'n Microsoft Windows 7, 8 of 10 bedryfstelsel, insluitend toegang tot die internet vanaf die rekenaar of skootrekenaar met 'n Internetspoed van minstens 2Mbps.*
 - *Microsoft Office 2016 of Office 365. Geregistreerde studente van die NWU sal Office 365 ProPlus gratis kan installeer.*
 - *Dit is **VERPLIGTEND** en die verantwoordelikheid van die student om die nodige tegnologie soos 'n rekenaar en selfoon te kry wat aan die minimum vereistes van die NWU voldoen, naamlik: Wi-Fi-enabled, Windows-, Android- of Apple-bedryfstelsel, 3G-enabled (verkieslik) en 32 Gig (verkieslik).*

Students enrolled for the degree will not attend classes on campus. They submit assignments via eFundi - and attend contact/facilitation sessions referred to as Interactive Whiteboard Sessions (IWBs). It is not compulsory to attend IWB sessions and they are also recorded and placed on the UODL website to view when convenient. Students will be communicated with via eFundi and SMS.

Take note: Fees payable per year for BSc in IT distance learning, include tuition fees, textbooks and software. All study material required for a particular year, will be sent to the student by courier. /

Studente wat vir die graad ingeskryf is, draf nie op kampus klas nie. Studente dien werkopdragte via eFundi in en woon kontak-/fasiliteringsessies by waarna verwys word as Interaktiewe Witbord Sessies (IWB's). Bywoning van hierdie sessies is nie verpligtend nie. Kontaksessies word opgeneem en word ook op die UODL webwerf geplaas, waarna studente kan kyk wanneer dit hul pas. Die universiteit sal met hierdie studente via eFundi en SMS kommunikeer.

Neem kennis: Gelde betaalbaar vir BSc in IT afstandstudie, sluit klasgelde, handboeke en sagteware in. Alle studiemateriaal wat benodig word vir 'n betrokke jaar, word per koerier na die student gestuur.

**NAS.1.17.2 Programme: Bachelor of Science in Information Technology /
Baccalaureus Scientiae in Inligtingstegnologie**

CODE/ KODE: 2DX H01 - N302P; N302V

CODE/ KODE: 2HA H01 - N301P (Distance: offered only in English / Afstand: word slegs in Engels aangebied)

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Vaaltriangle (English see NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS and/en Distance / Afstand (Distance 2019 1st & 2nd yrs only- offered on PC/ Afstand 2019 slegs 1^{ste} & 2^{de} jrs- aangebied op PK)

Compilation of programme / Samestelling van program: N301P; N302P; N302V

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
CMPG111	H	12	CMPG211	H	16	CMPG311	H	16
STTN111	X	12	CMPG212	H	8	CMPG312	H	16
BMAN111	X	12	CMPG213	H	16	CMPG313	H	16
*MTHS111 OR/OF MTHS113	X	12	CMPG214	H	8	CMPG315	H	16
ACCS111 OR/OF *ACCF111		16	CMPG215	H	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		64	Total / Totaal 1 st semester		68	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
CMPG121	H	12	CMPG221	H	8	CMPG321	H	16
CMPG122	H	12	CMPG222	H	8	CMPG322	H	16
STTN121	X	12	CMPG223	H	16	CMPG323	H	16
ACCS121 OR/OF *ACCF121	X	16	BMAN223	X	16	CMPG324	H	16
ALDE/A122	X	12	WVNS221	X	12			
			MTHS225	X	8			
Total / Totaal 2 nd semester		64	Total / Totaal 2 nd semester		68	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		128	Total year level / Totaal jaarvlak 2		136	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								392

*MTHS111, ACCF111 and ACCF121: Only available for full time campus students- not available for distance learning / Slegs beskikbaar vir voltydse kampusstudente, nie vir afstandsl eer beskikbaar nie.

**NAS.1.17.2.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT)
PC/VTG: Bachelor of Science in Information Technology / *Baccalaureus Scientiae in Inligtingstegnologie***

Curriculum / *kurrikulum*: Information Technology / *Inligtingstegnologie*

CODE/ KODE: 2DX H01 – N301P; N301V (3rd yrs/ 3^{de} jrs)

CODE/ KODE: 264100 – N150P; N150V (Pipeline only / *Slegs Pyplyn*)

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Vaaltriangle (English see NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / *VOLTYDS*

Compilation of programme / *Samestelling van program*: **N301P; N301V; N150P; N150V**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW112	H	12	ITRW211	H	8	ITRW311	H	16
STTN111	X	12	ITRW212	H	16	ITRW313	H	8
WISN111	X	12	ITRW213	H	16	ITRW315	H	8
OR/OF WISN113								
BMAN111	X	12	ITRW214	H	16	ITRW316	H	16
ACCS111	X	16	WVNS211	X	12	ITRW317	H	16
OR/OF ACCF111								
Total / Totaal 1 st semester		64	Total / Totaal 1 st semester		68	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW123	H	12	ITRW222	H	16	ITRW321	H	16
ITRW124	H	12	ITRW225	H	16	ITRW322	H	16
STTN121	X	12	BMAN222	X	16	ITRW324	H	16
ACCS121	X	16	WVNS221	X	12	ITRW325	H	16
OR/OF ACCF121								
AGLA121	X	12	WISN223	X	8			
Total / Totaal 2 nd semester		64	Total / Totaal 2 nd semester		68	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		128	Total year level / Totaal jaarvlak 2		136	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								392

NAS.1.18 PROGRAMME: BACHELOR OF SCIENCE IN MATHEMATICAL SCIENCES / BACCALAUREUS SCIENTIAE IN WISKUNDIGE WETENSKAPPE

NAS.1.18.1 Programme outcomes/ Program uitkomst

At the completion of this qualification in Mathematical Sciences the student should have:

(i) the ability to integrate the knowledge and techniques of the core subjects in the programme in order to understand reality, investigate and apply the knowledge and techniques to solve relevant problems;

(ii) the skills to gather information electronically and otherwise, and be able to process, evaluate and report on scientific information, solve problems, prepare for lifelong learning, and finally, to perform mathematical-analytical and mathematical-numerical data processing;

(iii) the ability to work as an individual or in groups and, where necessary to exercise the necessary leadership; to be able to communicate in writing and present scientific data and possible solutions to identified problems orally;

(iv) the ability to maintain high ethical norms when practising science and demonstrating responsibility towards fellow human beings and the environment, in particular when performing scientific investigations.

By voltooiing van die kwalifikasie in Wiskundige Wetenskappe behoort die student die volgende vaardighede te toon:

(i) die kennis en tegnieke van die kernvakke in die program te kan integreer om die werklikheid te verstaan, en kennis en tegnieke toe te pas om relevante probleme op te los;

(ii) die vermoë om informasie elektronies en andersins te versamel, te kan prosesseer, beoordeel, en verslag te kan doen oor wetenskaplike informasie, probleme op te los, voor te berei vir lewenslange ondersoek, en laastens, om wiskundig-analitiese en wiskundig-numeriese data prosessering te doen;

(iii) die vermoë om as individu of in 'n groep te werk en, waar nodig die nodige leierskap te kan uitoefen; om wetenskaplike data en moontlike oplossings wat geïdentifiseer is, in skrif of mondelings te kan aanbied;

(iv) die vermoë om in die beoefening van wetenskap hoë etiese norme te kan handhaaf, en verantwoordelikheid teenoor medemense en die omgewing te kan toon, in die besonder met die uitvoer van wetenskaplike ondersoeke.

NAS.1.18.2 Programme: Bachelor of Science in Mathematical Sciences with Statistics and Mathematics / *Baccalaureus Scientiae in Wiskundige Wetenskappe met Statistiek en Wiskunde*

CODE/ KODE: 2FG H02 - N301P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:*

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
CMPG111	X	12	CMPG211	X	16	MTHS311	H	16
NPHY111	X	12	MTHS211	H	8	MTHS312	H	16
MTHS111	H	12	MTHS212	H	8	STTN316	H	24
STTN115	H	12	STTN215	H	16	STTN317	H	8
ALDE/A111	X	12	WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
APPM122	H	12	CMPG221	X	8	MTHS321	H	16
CMPG121	X	12	CMPG222	X	8	MTHS322	H	16
MTHS121	H	12	MTHS221	H	8	STTN326	H	16
STTN125	H	12	MTHS222	H	8	STTN327	H	16
ALDE/A122	X	12	STTN225	H	16			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.18.2.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC: BSc in Computer and Mathematical Sciences/ BSc in Rekenaar- en Wiskundige Wetenskappe

Curriculum / Kurrikulum: Statistics and Mathematics / *Statistiek en Wiskunde*

CODE/ KODE: 200191CAMPUS/ **KAMPUS:** Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program: **N158P (3rd yrs / 3de jrs)**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ITRW112	X	12	ITRW212	X	16	WISN314	H	16
FSKS111	X	12	WISN211	H	8	WISN312	H	16
WISN111	H	12	WISN212	H	8	STTN316	H	24
STTN115	H	12	STTN215	H	16	STTN317		8
AGLA111	X	12	WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
TGWN122	H	12	ITRW222	X	16	WISN324	H	16
ITRW124	X	12	WISN224	H	8	WISN322	H	16
WISN121	H	12	WISN226	H	8	STTN326	H	16
STTN125	H	12	STTN225	H	16	STTN327	H	16
AGLA121	X	12	WVNS221	X	12			
+Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.18.2.2 OLD PROGRAMME (PHASING OUT) MC: BSc in Statistics and Mathematics Sciences

CODE: 200138

Curriculum: Statistics and Mathematics

CAMPUS: Mafikeng(English)

DELIVERY MODE: FULL TIME

Compilation of programme: **N306M (3rd yrs)**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
MAYM117	H	12	MAYM217	H	16	MAYM317	H	16
STFM111	H	12	STFM211	H	8	MAYM318	H	16
APMM117	X	12	STFM212	H	8	STFM311	H	16
CISM112	H	12	APPM217	X	16	STFM312	H	16
AGLE111	X	12	WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
MAYM 127	H	12	MAYM 227	H	16	MAYM 327	H	16
STFM 121	H	12	STFM 221	H	8	MAYM 328	H	16
APMM 127	X	12	STFM 222	H	8	STFM 321	H	16
CISM124	X	12	APMM227	X	16	STFM 322	H	16
AGLE121	X	12	WVNS221	X	12			
+Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

**NAS.1.18.3 Programme: Bachelor of Science in Mathematical Sciences /
Baccalaureus Scientiae in Wiskundige Wetenskappe**

NAS.1.18.3.1 Programme outcomes Mathematics / Program uitkomst : Wiskunde

To fulfil the requirements of this degree all students on the Potchefstroom campus, must take at ***least two** of the three modules in the second semester of the third year: APPM321 Dynamical Systems, APPM322 Optimisation and APPM323 Fluid Mechanics. Please note that the module APPM323 Fluid Mechanics will only be presented on the Potchefstroom campus if there is sufficient interest, and if capacity allows it. Please consult the subject group Mathematics and Applied Mathematics for advice in this regard. /

*Om die voorwaardes van die graad te bereik, moet all studente op die Potchefstroom in die tweede semester van die derde jaar ten minste ***twee** van die drie modules APPM321 Dinamiese Stelsels, APPM322 Optimalisering en APPM323 Vloeimeganika voltooi. Let asseblief daarop dat die module APPM323 Vloeimeganika slegs op die Potchefstroom kampus aangebied sal word indien daar voldoende belangstelling is en kapasiteit dit toelaat. Raadpleeg asseblief die vakgroep Wiskunde en Toegepaste Wiskunde vir advies in die verband.*

NAS.1.18.3.1.1 CODE/ KODE: 2FG H01 - N301P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme **Mathematics / Samestelling van program Wiskunde**

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	STTN215	X	16	APPM311	H	16
NPHY111	X	12	APPM211	H	8	APPM312	H	16
CMPG111	X	12	APPM212	H	8	MTHS311	H	16
STTN115	X	12	MTHS211	H	8	MTHS312	H	16
MTHS111	H	12	MTHS212	H	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	APPM221	H	8	MTHS321	H	16
CMPG122	X	12	APPM222	H	8	MTHS322	H	16
STTN125	X	12	STTN225	X	16	*Select 2 of the following modules / *Kies 2 van die volgende modules*		
APPM122	H	12	MTHS221	H	8	APPM321	H	16
						APPM322	H	16
						APPM323	H	16
MTHS121	H	12	MTHS222	H	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

**NAS.1.18.3.2 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
BSc in Computer and Mathematical Sciences/ BSc in Rekenaar- en
Wiskundige Wetenskappe**

Curriculum / Kurrikulum: Mathematics/ Wiskunde

CODE/ KODE: 200191

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program **N159P** (3rd yrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
FSKS111	X	12	STTN215	X	16	TGWN311	H	16
ITRW112	X	12	TGWN211	H	8	TGWN312	H	16
STTN115	X	12	TGWN213	H	8	WISN314	H	16
WISN111	H	12	WISN211	H	8	WISN312	H	16
AGLE111	X	12	WISN212	H	8			
			WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLE121	X	12	STTN225	X	16	TGWN323	H	16
ITRW123	X	12	TGWN221	H	8	TGWN322	H	16
STTN125	X	12	TGWN223	H	8	WISN324	H	16
TGWN122	H	12	WISN224	H	8	WISN322	H	16
WISN121	H	12	WISN226	H	8			
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.18.4 Programme: Bachelor of Science in Mathematical Sciences with Applied Mathematics and Mathematics

CODE: 2FG H03 - N301M

CAMPUS: Mafikeng (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st & 2nd yrs)

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE111	X	12	APPM212	H	8	APPM311	H	16
APPM111	H	12	APPM213	H	8	APPM313	H	16
CMPG111	X	12	MTHS211	H	8	MTHS311	H	16
NPHY111	X	12	MTHS212	H	8	MTHS312	H	16
MTHS111	H	12	NPHY211	X	8			
			NPHY212	X	8			
			WVNS211	X	12			
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
ALDE122	X	12	APPM222	H	8	APPM322	H	16
APPM122	H	12	APPM223	H	8	APPM323	H	16
CMPG121	X	12	MTHS221	H	8	MTHS321	H	16
MTHS121	H	12	MTHS222	H	8	MTHS322	H	16
NPHY121	X	12	NPHY221	X	8			
			NPHY222	X	8			
			WVNS221	X	12			
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

**NAS.1.18.4.1 OLD PROGRAMME (PHASING OUT) MC: BSc in Applied Mathematics-
Mathematics**

Curriculum: Applied Mathematics and Mathematics

CODE/ KODE: 200172: N115M

CAMPUS/ KAMPUS: MAFIKENG (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME

Compilation of programme:**N115M (3rd yrs)**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLE 111	X	12	WVNS 211	X	12	APMM 317	H	16
APMM 117	H	12	APMM 217	H	16	APMM 318	H	16
PHYM 118	X	12	PHYM 215	X	8	MAYM 317	H	16
MAYM 117	H	12	PHYM 216	X	8	MAYM 318	H	16
CISM 112	X	12	MAYM 217	H	16			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLE 121	X	12	WVNS 221	X	12	APMM 327	H	16
APMM 127	H	12	APMM 227	H	16	APMM 328	H	16
PHYM 128	X	12	PHYM 221	X	8	MAYM 327	H	16
MAYM 127	H	12	PHYM 222	X	8	MAYM 328	H	16
CISM 124	X	12	MAYM 227	H	16			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19 PROGRAMME: BACHELOR OF SCIENCE IN BIOLOGICAL SCIENCES / BACCALAUREUS SCIENTIAE IN BIOLOGIESE WETENSAPPE

NAS.1.19.1 Programme / program: Bachelor of Science in Biological Sciences with Microbiology and Biochemistry / Baccalaureus Scientiae in Biologiese Wetenskappe met Mikrobiologie en Biochemie

CODE/ KODE: 2DK H11 - N301P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Mafikeng (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
NCHE111	H	12	MKBN211	H	16	*Only PC/Slegs PC **Only MC/Slegs MC		
MTHS114	X	12	BCHN213	H	16	MKBS313*	H	16
						OR/OF MKBS316**		
NPHY111** OR/OF FLGX113* OR/OF PLKS111	X	12	NCHE211 & NCHE212	X	16	MKBS314* OR/OF MKBS317**	H	16
MCBN111	X	12	WVNS211	X	12	BCHS316	H	16
ALDE/A111	X	12				BCHS317	H	16
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
NCHE121	H	12	MKBS221	H	16	BCHS321	H	16
MTHS124	X	12	BCHN222	H	16	BCHS322	H	16
NPHY121** OR/OF FLGX123* OR/OF PLKS121	X	12	NCHE221 & NCHE222	X	16	MKBS325* OR/OF MKBS326** & MKBS327**	H	32
						H	16	
						H	16	
MCBN121	X	12	WVNS221	X	12	*Only PC/Slegs PC **Only MC/Slegs MC		
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

*Can only be taken on Potchefstroom campus / * Kan slegs by Potchefstroomkampus geneem word.

**Can only be taken on Mafikeng campus / ** Kan slegs by die Mafikengkampus geneem word.

**NAS.1.19.1.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
BSc in Environmental and Biological Sciences/ BSc in Omgewings- en
Biologiese Wetenskappe**

Curriculum / Kurrikulum: Microbiology and Biochemistry/ *Mikrobiologie en Biochemie*

CODE/ KODE: 200118: N167P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program N167P (3rd yrs / 3^{de} jrs)*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
CHEM111	H	12	MKBN211	H	16	MKBS313	H	16
WISN111	X	12	BCHN213	H	16	MKBS314	H	16
FSKS113	X	12	CHEN211 & CHEN212	X	8 8	BCHS316	H	16
PLKS111 OR/OF FLGX113	X	12	WVNS211	X	12	BCHS317	H	16
AGLE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
CHEM121	H	12	MKBS221	H	16	MKBS325	H	32
WISN121	X	12	BCHN222	H	16	BCHS321	H	16
FSKS123	X	12	CHEN222 & CHEN223	X	16	BCHS322	H	16
PLKS121 OR/OF FLGX123	X	12	WVNS221	X	12			
AGLE/A121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19.1.2 OLD PROGRAMME (PHASING OUT) MC: BSc in Microbiology and Biochemistry: Curriculum: Microbiology and Biochemistry

CODE: 200118: N167M

CAMPUS: Mafikeng (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N167M (3rd yrs)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	MKBS 316	H	16
BGYM 113	H	12	MKBS 211	H	8	MKBS 317	H	16
MAYM 116	X	12	MKBS 212	H	8	BCHS 314	H	16
MCHE 114	H	12	BCHS 211	H	8	BCHS 315	H	16
PHYM 118	X	12	BCHS 212	H	8			
			MCHE 215	X	8			
			MCHE 216	X	8			
Total 1 st Semester		60			60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
BGYM 123	H	12	WVNS 221	X	12	MKBS 326	H	16
MCHE 121	H	12	MKBS 223	H	8	MKBS 327	H	16
PHYM 128	X	12	MKBS 222	H	8	BCHS 324	H	16
MAYM 126	X	12	BCHS 221	H	8	BCHS 325	H	16
AGLE 121	X	12	BCHS 222	H	8			
			MCHE 221	X	8			
			MCHE 223	X	8			
Total 2 nd semester		60	Total 2 nd semester		60	Total 2 nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.19.2 Programme: Bachelor of Science in Biological Sciences with Botany and Biochemistry / Baccalaureus Scientiae in Biologiese Wetenskappe met Plantkunde en Biochemie

This programme represents an aligned programme, which replaces the programmes containing Biology on the MC. To reflect the fields of expertise on the two campuses, the third year Botany modules are electives, which are campus specific. / Hierdie program verteenwoordig 'n gerigte program wat die Biologie-bevattende programme op die MK vervang. Om die vakkundigheid op die twee kampusse te weerspieël, is die derdejaar Plantkunde-modules keusemodules, wat kampsesspesifiek is.

NAS.1.19.2.1 Curriculum / Kurrikulum: Botany and Biochemistry / Plantkunde en Biochemie

CODE/ KODE: 2DK H02 - N302P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English); Mafikeng (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS111	H	12	PLKN213	H	16	PLKS312* OR/OF PLKS313**	H	32
NCHE111	X	12	BCHN213	H	16	BCHS316	H	16
MTHS114	X	12	NCHE211 & NCHE212	X	8 8	BCHS317	H	16
MCBN111	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS121	H	12	PLKS221	H	16	PLKN323* OR/OF PLKN324**	H	32
NCHE121	X	12	BCHN222	H	16	BCHS321	H	16
MTHS124	X	12	NCHE221 & NCHE222	X	8 8	BCHS322	H	16
MCBN121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

*Can only be taken on the Potchefstroom campus / **Can only be taken on the Mafikeng campus

NAS.1.19.2.2 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Curriculum / Kurrikulum: Botany and Biochemistry / Plantkunde en Biochemie

CODE/ KODE: 2DK H02 - N301P (3rd yrs / 3^{de} jrs): BSc in Biological Sciences with Botany and Biochemistry/ *BSc in Biologiese Wetenskappe met Plantkunde en Biochemie*

CODE/ KODE: 200118 - N170P (Pipeline / Pyplyn)

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS111	H	12	PLKN213	H	16	PLKS312	H	12
CHEM111	X	12	BCHN213	H	16	BCHS316	H	16
WISN111	X	12	CHEN211 & CHEN212	X	8 8	BCHS317	H	16
DRKS111 OR/OF GLGN112	X	12	WVNS211	X	12			
AGLA111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS121	H	12	PLKS221	H	16	PLKN323	H	32
CHEM121	X	12	BCHN222	H	16	BCHS321	H	16
WISN121	X	12	CHEN222 & CHEN223	X	8 8	BCHS322	H	16
DRKS121 OR/OF GLGN122	X	12	WVNS221	X	12			
AGLA121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19.3 Programme: Bachelor of Science in Biological Sciences with Zoology and Biochemistry / *Baccalaureus Scientiae in Biologiese Wetenskappe met Dierkunde en Biochemie*

CODE/ KODE: 2DK H07 - N302P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program N301P:*

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS111	H	12	DRKN211	H	16	DRKS311	H	32
NCHE111	H	12	BCHN213	H	16	BCHS316	H	16
MCBN111	X	12	NCHE211 & NCHE212	X	8 8	BCHS317	H	16
MTHS114	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS121	H	12	DRKS221	H	16	DRKN321	H	16
NCHE121	H	12	BCHN222	H	16	DRKS322	H	16
MCBN121	X	12	NCHE221 & NCHE222	X	8 8	BCHS321	H	16
MTHS124	X	12	WVNS221	X	12	BCHS322	H	16
ALDA/E122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19.3.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Curriculum / Kurrikulum: Zoology and Biochemistry / Dierkunde en Biochemie

CODE/ KODE: 2DK H07 - N301P (3rd yrs / 3^{de} jrs): Bachelor of Science in Biological Sciences with Zoology and Biochemistry / *Baccalaureus Scientiae in Biologiese Wetenskappe met Dierkunde en Biochemie*

CODE/ KODE: 200118 - N160P (Pipeline / Pyplyn): BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program: N301P [N160P]

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS111	H	12	DRKN211	H	16	DRKS311	H	32
CHEM111	H	12	BCHN213	H	16	BCHS316	H	16
FLGX113	X	12	CHEN211 & CHEN212	X	8 8	BCHS317	H	16
WISN111	X	12	WVNS211	X	12			
AGLA111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS121	H	12	DRKS221	H	16	DRKN321	H	16
CHEM121	H	12	BCHN222	H	16	DRKS322	H	16
FLGX123	X	12	CHEN222 & CHEN223	X	8 8	BCHS321	H	16
WISN121	X	12	WVNS221	X	12	BCHS322	H	16
AGLA121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19.4 Programme: Bachelor of Science in Biological Sciences with Chemistry and Physiology / *Baccalaureus Scientiae in Biologiese Wetenskappe met Chemie en Fisiologie*

CODE/ KODE: 2DK H06 - N302P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:*

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	BCHN213	X	16	NCHE311	H	16
NCHE111	H	12	NCHE211	H	8	NCHE312	H	16
FLGX113	H	12	NCHE212	H	8	FLGX312	H	8
MCBN111	X	12	FLGX213	H	16	FLGX313	H	8
MTHS114	X	12	WVNS211	X	12	FLGX317	H	8
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		56
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	BCHN222	X	16	NCHE321	H	16
NCHE121	H	12	NCHE221	H	8	NCHE322	H	16
FLGX123	H	12	NCHE222	H	8	FLGX325	H	16
MCBN121	X	12	FLGX223	H	8	FLGX328	H	8
MTHS124	X	12	FLGX224	H	8	FLGX329	H	8
			WVNS221	X	12	FKLT331	H	8
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		72
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19.4.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Curriculum / Kurrikulum: Chemistry and Physiology / Chemie en Fisiologie

CODE/ KODE: 2DK H06 - N301P (23rd yrs / 3^{de} jrs): Bachelor of Science in Biological Sciences with Chemistry and Physiology / *Baccalaureus Scientiae in Biologiese Wetenskappe met Chemie en Fisiologie*

CODE/ KODE: 200190 - N177P (Pipeline / Pyplyn): BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLA111	X	12	BCHN213	X	16	CHEM311	H	16
CHEM111	H	12	CHEN211	H	8	CHEN312	H	16
FLGX113	H	12	CHEN212	H	8	FLGX312	H	8
FSKS113	X	12	FLGX213	H	16	FLGX313	H	8
WISN111	X	12	WVNS211	X	12	FLGX317	H	8
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		56
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLA121	X	12	BCHN222	X	16	CHEN321	H	16
CHEM121	H	12	CHEN222	H	8	CHEN322	H	16
FLGX123	H	12	CHEN223	H	8	FLGX325	H	16
FSKS123	X	12	FLGX223	H	8	FLGX326	H	16
WISN121	X	12	FLGX224	H	8	FLGX329	H	8
			WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		72
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19.5 Programme: Bachelor of Science in Biological Sciences with Zoology and Physiology / Baccalaureus Scientiae in Biologiese Wetenskappe met Dierkunde en Fisiologie

CODE/ KODE: 2DK H03 - N302P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	DRKN211	H	16	DRKS311	H	32
NCHE111	X	12	FLGX213	H	16	FLGX312	H	8
DRKS111	H	12	MKBN211	X	16	FLGX313	H	8
FLGX113	H	12	WVNS211	X	12	FLGX317	H	8
FSKS113	X	12						
OR/OF								
PLKS111								
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		56
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	DRKS221	H	16	DRKN321	H	16
NCHE121	X	12	FLGX223	H	8	DRKS322	H	16
DRKS121	H	12	FLGX224	H	8	FLGX325	H	16
FLGX123	H	12	MKBS221	X	16	FLGX328	H	8
FSKS123	X	12	WVNS221	X	12	FLGX329	H	8
OR/OF								
PLKS121								
						FKLT331	H	8
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		72
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19.5.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Curriculum / Kurrikulum: Zoology and Physiology / Dierkunde en Fisiologie

CODE/ KODE: 2DK H03 - N301P (3rd yrs/ 3^{de} jrs): Bachelor of Science in Biological Sciences with Zoology and Physiology / *Baccalaureus Scientiae in Biologiese Wetenskappe met Dierkunde en Fisiologie*

CODE/ KODE: 200118 - N185P (Pipeline / Pyplyn): BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLA111	X	12	DRKN211	H	16	DRKS311	H	32
CHEM111	X	12	FLGX213	H	16	FLGX312	H	8
DRKS111	H	12	MKBN211	X	16	FLGX313	H	8
FLGX113	H	12	WVNS211	X	12	FLGX317	H	8
FSKS113	X	12						
OR/OF PLKS111								
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		56
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLA121	X	12	DRKS221	H	16	DRKN321	H	16
CHEM121	X	12	FLGX223	H	8	DRKS322	H	16
DRKS121	H	12	FLGX224	H	8	FLGX325	H	16
FLGX123	H	12	MKBS221	X	16	FLGX326	H	16
FSKS123	X	12	WVNS221	X	12	FLGX329	H	8
OR/OF PLKS121								
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		72
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19.6 Programme: Bachelor of Science in Biological Sciences with Microbiology and Physiology / Baccalaureus Scientiae in Biologiese Wetenskappe met Mikrobiologie en Fisiologie

CODE/ KODE: 2DK H04 - N302P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (1st yrs & 2nd yrs) / NUWE PROGRAM (1st jrs & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	NCHE211	X	8	FLGX312	H	8
NCHE111	X	12	NCHE213	X	8	FLGX313	H	8
DRKS111	X	12	FLGX213	H	16	FLGX317	H	8
FLGX113	H	12	MKBN211	H	16	MKBS313	H	16
FSKS113	X	12	WVNS211	X	12	MKBS314	H	16
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		56
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	BCHN222	X	16	FLGX325	H	16
NCHE121	X	12	FLGX223	H	8	FLGX328	H	8
DRKS121	X	12	FLGX224	H	8	FLGX329	H	8
FLGX123	H	12	MKBS221	H	16	MKBS325	H	32
FSKS123	X	12	WVNS221	X	12	FKLT331	H	8
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		72
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19.6.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Curriculum / Kurrikulum: Microbiology and Physiology / Mikrobiologie en Fisiologie

CODE/ KODE: 2DK H04 - N301P (3rd yrs / 3^{de} jrs): BSc in Biological Sciences with Microbiology and Physiology / *BSc in Biologiese Wetenskappe met Mikrobiologie en Fisiologie*

CODE/ KODE: 200118 - N186P (Pipeline / Pyplyn): BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLA111	X	12	CHEN211	X	8	FLGX312	H	8
CHEM111	X	12	CHEN213	X	8	FLGX313	H	8
DRKS111	X	12	FLGX213	H	16	FLGX317	H	8
FLGX113	H	12	MKBN211	H	16	MKBS313	H	16
FSKS113	X	12	WVNS211	X	12	MKBS314	H	16
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		56
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLA121	X	12	BCHN222	X	16	FLGX325	H	16
CHEM121	X	12	FLGX223	H	8	FLGX326	H	16
DRKS121	X	12	FLGX224	H	8	FLGX329	H	8
FLGX123	H	12	MKBS221	H	16	MKBS325	H	32
FSKS123	X	12	WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		72
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

**NAS.1.19.7 Programme: BSc in Biological Sciences with Zoology and Microbiology /
BSc in Biologiese Wetenskappe met Dierkunde en Mikrobiologie**

CODE/ KODE: 2DK H08 - N301P: BSc in Biological Sciences with Zoology and Microbiology/
BSc in Biologiese Wetenskappe met Dierkunde en Mikrobiologie

CODE/ KODE: 200118 - N163P (Pipeline only / Slegs Pyplyn): BSc in Environmental and
Biological Sciences / BSc in Omgewings- en Biologiese Wetenskappe

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS111	H	12	DRKN211	H	16	DRKS311	H	32
NCHE111	H	12	MKBN211	H	16	MKBS313	H	16
FLGX113	X	12	BCHN213 OR/OF PLKN213 OR/OF FLGX213	X	16	MKBS314	H	16
PLKS111 OR/OF MCBN111	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS121	H	12	DRKS221	H	16	DRKN321	H	16
NCHE121	H	12	MKBS221	H	16	DRKS322	H	16
FLGX123	X	12	BCHN222 OR/OF PLKS221 OR/OF FLGX223 & FLGX224	X	16	MKBS325	H	32
PLKS121 OR/OF MCBN121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19.8 Programme: Bachelor of Science in Biological Sciences with Zoology and Botany / Baccalaureus Scientiae in Biologiese Wetenskappe met Dierkunde en Plantkunde

CODE/ KODE: 2DK H09 - N301P: BSc in Biological Sciences with Zoology and Botany/ BSc in Biologiese Wetenskappe met Dierkunde en Plantkunde

CODE/ KODE: 200118 - N164P (Pipeline only / Slegs Pyplyn): BSc in Environmental and Biological Sciences / BSc in Omgewings- en Biologiese Wetenskappe

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS111	H	12	DRKN211	H	16	DRKS311	H	32
PLKS111	H	12	PLKN213	H	16	PLKS312	H	32
NCHE111	X	12	BCHN213 OR/OF GDKN211 OR/OF MKBN211	X	16			
FLGX113 OR/OF GLGN112	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS121	H	12	DRKS221	H	16	DRKN321	H	16
PLKS121	H	12	PLKS221	H	16	DRKS322	H	16
NCHE121	X	12	BCHN222 OR/OF GDKN221 OR/OF MKBS221	X	16	PLKN323	H	32
FLGX123 OR/OF GDKN121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.19.9 Programme: Bachelor of Science in Biological Sciences with Microbiology and Botany / Baccalaureus Scientiae in Biologiese Wetenskappe met Mikrobiologie en Plantkunde

This programme represents an aligned programme, which replaces the programmes containing Biology on the MC. To reflect the fields of expertise on the two campuses, the third year Microbiology modules are electives, which are campus specific. /

Hierdie program verteenwoordig 'n belynde program wat die Biologie-bevattende programme op die MC vervang. Om die kundigheidsveld op die twee kampusse te weerspieël, is die derdejaar Mikrobiologie modules keusemodules, wat kampusspesifiek is.

CODE/ KODE: 2DK H10 - N302P; N301M (1st & 2nd yrs / 1^{ste} & 2^{de} jrs)

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English); MAFIKENG (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS111	H	12	MKBN211	H	16	MKBS313* OR/OF MKBS316**	H	16
NCHE111	X	12	PLKN213	H	16	MKBS314* OR/OF MKBS317**	H	16
*DRKS111 OR/OF GEOG111 OR/OF **MCBN111	X	12	BCHN213 OR/OF GEOG211 OR/OF DRKN211*	X	16	PLKS312* OR/OF PLKS313**	H	32
*FSKS113 OR/OF **NPHY111	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS121	H	12	PLKS221	H	16	PLKN323* OR/OF PLKN324**	H	32
NCHE121	X	12	MKBS221	H	16	MKBS325* OR/OF MKBS326** & MKBS327**	H H H	32 16 16
*DRKS121 OR/OF	X	12	BCHN222 OR/OF	X	16			

GEOG121 OR/OF **MCBN121			GEOG221 OR/OF DRKS221*					
*FSKS123 OR/OF **NPHY121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

* Can only be taken on the Potchefstroom campus/ Kan slegs op die Potchefstroomkampus geneem word.

**Can only be taken on the Mafikeng campus/ Kan slegs op die Mafikengkampus geneem word.

NAS.1.19.9.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT)PC:
Curriculum / Kurrikulum: Microbiology and Botany / *Mikrobiologie en Plantkunde*

CODE/ KODE: 2DK H10 - N301P (3rd yrs/ 3^{de} jrs): BSc in Biological Sciences with Microbiology and Botany / *BSc in Biologiese wetenskappe met Mikrobiologie en Plantkunde*

CODE/ KODE: 200118 - N169P (Pipeline only / *Slegs Pyplyn*): BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS111	H	12	MKBN211	H	16	MKBS313	H	16
CHEM111	X	12	PLKN213	H	16	MKBS314	H	16
FSKS113	X	12	BCHN213 OR DRKN211	X	16	PLKS312	H	32
DRKS111 OR *GLGN112	X	12	WVNS211	X	12			
AGLA/E111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS121	H	12	MKBS221	H	16	MKBS325	H	32
CHEM121	X	12	PLKS221	H	16			
FSKS123	X	12	BCHN222 OR DRKS221	X	16	PLKN323	H	32
DRKS121 OR *GLGN122	X	12	WVNS221	X	12			
AGLA/E121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

*Take note: GLGN112/122 - No elective is available at level 2 for GLGN.

NAS.1.20 PROGRAMME: BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCES / BACCALAUREUS SCIENTIAE IN OMGEWINGSWETENSKAPPE

NAS.1.20.1 Faculty-specific rules for the programme / *Fakulteitspesifieke reëls vir die program*

The Faculty of Agricultural and Natural Science has a number of approved curricula that have a good basic training in environmental sciences. In compiling the programme/curricula work possibilities and manpower needs of our country are also considered. This programme/curriculum prepares the student for postgraduate studies (**Honours in Environmental Sciences**), recommended in order to registration with the South African Council for Natural Scientific Professions (SACNASP). /

*Die Fakulteit van Natuur- en Landbouwetenskappe het 'n aantal programme/kurrikulums goedgekeur wat 'n goeie basiese opleiding in die omgewingswetenskappe bied. By die samestelling van die programme/kurrikulums is ook oorweging geskenk aan beroepsmoontlikhede en die mannekragbehoefes van ons land. Hierdie programme/kurrikulums berei die student ook voor vir nagraadse studie (**Honneurs in Omgewingswetenskappe**), wat aanbeveel word met die oog op registrasie by die Suid-Afrikaanse Raad vir Natuurwetenskaplike Professies (SARNAP).*

NAS.1.20.2 Faculty Specific Admission Requirements/ *Fakulteitspesifieke toelatingsvereistes*

See paragraph NAS.1.16.3 / *Kyk paragraaf NAS.1.16.3*

Students that register for programmes/curriculums that include DRKS311, DRTS311, PLKN323, PLTN323, GDKN221 or GLGN321, should be aware that a compulsory field excursion forms part of this module. /

Studente wat vir programme/kurrikulums aansoek doen waarin DRKS311, DRTS311, PLKN323 asook PLTN323, GDKN221 en GLGN321 voorkom, moet bewus wees daarvan dat 'n verpligte veld-ekskursie deel vorm van hierdie modules.

NAS.1.20.3 Programme: BSc in Environmental Sciences with Microbiology and Chemistry / BSc in Omgewingswetenskappe met Mikrobiologie en Chemie

CODE/ KODE: 2DJ H10 - N301P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), MAFIKENG (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1st & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A111	X	12	BCHN213	X	16	NCHE311	H	16
MCBN111	X	12	NCHE211	H	8	NCHE312	H	16
MTHS114	X	12	NCHE212	H	8	MKBS313* OR/OF MKBS316**	H	16
NCHE111	H	12	MKBN211	H	16	MKBS314* OR/OF MKBS317**	H	16
FLGX113* OR/OF FSKS113* OR/OF NPHY111**	X	12	WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE/A122	X	12	BCHN222	X	16	NCHE321	H	16
MCBN121	X	12	NCHE221	H	8	NCHE322	H	16
MTHS124	X	12	NCHE222	H	8	MKBS325* OR/OF MKBS326**& MKBS327**	H H	32 16 16
NCHE121	H	12	MKBS221	H	16			
FSKS123* OR/OF FLGX123* OR/OF NPHY121**	X	12	WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

*Can only be taken on the Potchefstroom campus/ Kan slegs op die Potchefstroomkampus geneem word. ** Can only be taken on the Mafikeng campus/ Kan slegs op die Mafikengkampus geneem word.

**NAS.1.20.3.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT)PC:
BSc Environmental and Biological Sciences / BSc Omgewings- en
Biologiese Wetenskappe**

Curriculum / Kurrikulum: Microbiology-Chemistry / *Mikrobiologie- Chemie*

CODE/ KODE: 200 118 - N168P (3rd yrs & 3^{de} jrs): BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program: N168P*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
CHEM111	H	12	MKBN211	H	16	MKBS313	H	16
WISN111	X	12	CHEN211 & CHEN212	H	8 8	MKBS314	H	16
FSKS113	X	12	BCHN213	X	16	CHEM311	H	16
DRKS111	X	12	WVNS211	X	12	CHEN312	H	16
AGLA/E111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
CHEM121	H	12	MKBS221	H	16	MKBS325	H	32
WISN121	X	12	CHEN222 & CHEN223	H	8 8	CHEN321	H	16
FSKS123	X	12	BCHN222	X	16	CHEN322	H	16
DRKS121	X	12	WVNS221	X	12			
AGLA/E121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.3.2 OLD PROGRAMME (PHASING OUT) MC: CURRICULUM: Microbiology and Chemistry

CODE: 200118 - N168M: BSc in Microbiology – Chemistry (3rd yrs)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N168M**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 111	X	12	WVNS 211	X	12	MKBS 316	H	16
BGYM 113	H	12	MKBS 211	H	8	MKBS 317	H	16
MAYM 116	X	12	MKBS 212	H	8	MCHE 315	H	8
MCHE 114	H	12	MCHE 215	H	8	MCHE 316	H	8
		12	MCHE 216	H	8			
			BCHS 211	X	8			
			BCHS 212	X	8			
Total 1st Semester		60	Total 1st semester		60	Total 1st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
AGLE 121	X	12	WVNS 221	X	12	MKBS 326	H	16
BGYM123	H	12	MKBS 223	H	8	MKBS 327	H	16
MAYM 126	X	12	MKBS 222	H	8	MCHE 322	H	8
MCHE 121	H	12	MCHE 221	H	8	MCHE 321	H	8
PHYM 128	X	12	MCHE223	H	8			
			BCHS 221	X	8			
			BCHS 222	X	8			
Total 2nd semester		60	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3		128
Total credits for the programme								368

NAS.1.20.4 Programme: Bachelor of Science in Environmental Sciences with Chemistry and Geography

CODE: 2DJ H18 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st & 2nd yrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE111	X	12	NCHE211	H	8	NCHE311	H	16
NCHE111	H	12	NCHE212	H	8	NCHE312	H	16
MTHS111	X	12	NPHY211& NPHY212 OR MTHS211& MTHS212	X X X X	8 8 8 8	GEOG311	H	32
NPHY111	X	12	GEOG211	H	16			
GEOG111	H	12	WVNS211	X	12			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ALDE122	X	12	GEOG221	H	16	NCHE321	H	16
NCHE121	H	12	NPHY221& NPHY222 OR MTHS221& MTHS222	X X X X	8 8 8 8	NCHE322	H	16
MTHS121	X	12	NCHE221	H	8	GEOG321	H	32
NPHY121	X	12	NCHE222	H	8			
GEOG121	H	12	WVNS222	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.4.1 OLD PROGRAMME (PHASING OUT) MC: CURRICULUM: Chemistry and Geography

CODE: 200150 – N301M: BSc in Chemistry and Geography (3rd yrs)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GEOM 113	H	12	WVNS 211	X	12	GEOM 316	H	16
MCHE 114	H	12	GEOM 214	H	8	GEOM 317	H	16
MAYM 117	X	12	GEOM 215	H	8	MCHE 315	H	16
PHYM 118	X	12	MCHE 215	H	8	MCHE 316	H	16
AGLE 111	X	12	MCHE 216	H	8			
			PHYM 215 & PHYM 216 OR MAYM 217	X	8 8 16			
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GEOM 123	H	12	GEOM 224	H	8	GEOM 328	H	16
MCHE 121	H	12	GEOM 225	H	8	GEOM 329	H	16
MAYM 127	X	12	MCHE 221	H	8	MCHE 321	H	16
PHYM 128	X	12	MCHE 223	H	8	MCHE 322	H	16
AGLE 121	X	12	PHYM 221 & PHYM 222 OR MAYM 227	X X X	8 8 16			
			WVNS 222	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.5 Programme: Bachelor of Science in Environmental Sciences with Botany and Chemistry / *Baccalaureus Scientiae in Omgewingswetenskappe met Plantkunde en Chemie*

NAS.1.20.5.1 Specific programme outcomes/ spesifieke program uitkomst

This programme represents an aligned programme, which replaces the Biology containing programmes on the MC. To reflect the fields of expertise on the two campuses, the third year Botany modules are electives, which are campus specific. / *Hierdie program verteenwoordig 'n belynde program wat die Biologie-programme op die MC vervang. Om die vakkundigheid op die twee kampusse te weerspieël, is die derdejaar Plantkunde-modules keusemodules, wat kampuspesifiek is.*

*Can only be taken on the Potchefstroom campus/ *Kan slegs op die Potchefstroomkampus geneem word.* ** Can only be taken on the Mafikeng campus/ *Kan slegs op die Mafikengkampus geneem word.*

NAS.1.20.5.1.1 CODE/ KODE: 2DJ H03 - N302P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English); MAFIKENG (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme **Botany and Chemistry** / Samestelling van program **Plantkunde en Chemie**

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1st & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS111	H	12	PLKN213	H	16	PLKS312* OR/OF PLKS313**	H	32
NCHE111	H	12	NCHE211 & NCHE212	H	8 8	NCHE311	H	16
MTHS114	X	12	BCHN213	X	16	NCHE312	H	16
GLGN112* OR/OF DRKS111* OR/OF MCBN111**	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS121	H	12	PLKS221	H	16	PLKN323* OR/OF PLKN324**	H	32
NCHE121	H	12	NCHE221 & NCHE222	H	16	NCHE321	H	16
MTHS124	X	12	BCHN222	X	16	NCHE322	H	16
GLGN122* OR/OF DRKS121* OR/OF MCBN121**	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

*Can only be taken on the Potchefstroom campus/ Kan slegs op die Potchefstroomkampus geneem word. ** Can only be taken on the Mafikeng campus/ Kan slegs op die Mafikengkampus geneem word.

NAS.1.20.5.2 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Curriculum / Kurrikulum: Botany and Chemistry / Plantkunde en Chemie

CODE/ KODE: 2DJ H03 - N301P: *Chemie (3rd yrs/ 3^{de} jrs)*: BSc in Environmental Sciences with Botany and Chemistry / *BSc in Omgewingswetenskappe met Plantkunde en Chemie*

CODE/ KODE: 200118 – N149P: **(Pipeline only / Slegs Pyplyn)**: BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program* :

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS111	H	12	PLKN213	H	16	PLKS312	H	32
CHEM111	H	12	CHEM211 & CHEM212	H	8 8	CHEM311	H	16
WISN111	X	12	BCHN213	X	16	CHEM312	H	16
GLGN112 OR/OF DRKS111 OR/OF FSKS113	X	12	WVNS211	X	12			
AGLA/E111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS121	H	12	PLKS221	H	16	PLKN323	H	32
CHEM121	H	12	CHEM222 & CHEM223	H	8 8	CHEM321	H	16
WISN121	X	12	BCHN222	X	16	CHEM322	H	16
GLGN122 OR/OF DRKS121 OR/OF FSKS123	X	12	WVNS221	X	12			
AGLA/E121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.6 Programme: Bachelor of Science in Environmental Sciences with Zoology and Chemistry / Baccalaureus Scientiae in Omgewingswetenskappe met Dierkunde en Chemie

CODE/ KODE : 2DJ H04 - N302P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS111	H	12	DRKN211	H	16	DRKS311	H	32
NCHE111	H	12	NCHE211 & NCHE212	H	8 8	NCHE311	H	16
FLGX113 OR/OF MCBN111	X	12	BCHN213 OR/OF FLGX213	X	16	NCHE312	H	16
MTHS114	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS121	H	12	DRKS221	H	16	DRKN321	H	16
NCHE121	H	12	NCHE221 & NCHE222	H	8 & 8	DRKS322	H	16
FLGX123 OR/OF MCBN121	X	12	BCHN222 OR/OF FLGX223 & FLGX224	X	16	NCHE321	H	16
MTHS124	X	12	WVNS221	X	12	NCHE322	H	16
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

**NAS.1.20.6.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Curriculum / Kurrikulum: Zoology and Chemistry / Dierkunde en Chemie**

CODE/ KODE: 2DJ H04 - N301P: (3rd yrs / 3^{de} jrs): BSc in Environmental Sciences with Zoology and Chemistry / *BSc in Omgewingswetenskappe met Dierkunde en Chemie*

CODE/ KODE: 200118 – N161P: (Pipeline only / Slegs Pyplyn): BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDYS

Compilation of programme / Samestelling van program:

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS111	H	12	DRKN211	H	16	DRKS311	H	32
CHEM111	H	12	CHEM211 & CHEN212	H	8 8	CHEM311	H	16
FLGX113 OF *FSKS113	X	12	BCHN213 OF FLGX213	X	16	CHEN312	H	16
WISN111	X	12	WVNS211	X	12			
AGLA111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS121	H	12	DRKS221	H	16	DRKN321	H	16
CHEM121	H	12	CHEM222 & CHEN223	H	8 & 8	DRKS322	H	16
FLGX123 OF *FSKS123	X	12	BCHN222 OF FLGX223 & FLGX224	X	16	CHEN321	H	16
WISN121	X	12	WVNS221	X	12	CHEN322	H	16
AGLA121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

*Neem kennis: FSKS113/123 – Geen keuse is op vlak 2 vir FSKS beskikbaar nie.

NAS.1.20.7 Programme: Bachelor of Science in Environmental Sciences with Geology and Chemistry / Baccalaureus Scientiae in Omgewingswetenskappe met Geologie en Chemie

NAS.1.20.7.1 Faculty-specific rules for the programme / Fakulteitspesifieke reëls vir die program

A compulsory soil mapping camp takes place for second-year soil science students (i.e. students who have registered for GDKN 221) during the winter recess. Second-year students will hand in a soil map and a report, of which the mark will contribute to the practical mark for GDKN221. Third-year geology students (i.e. students who have registered for GLGN 321) will attend a compulsory geology mapping camp in the spring recess period. A geological map and a report will be handed in during the second semester, of which the mark contributes to laboratory mark for GLGN 321. NO excuses for absence from the mapping camp will be accepted. In the event of illness, the onus is on the student to catch up with the work and to hand in the required assignments, maps and reports, as applicable, to be considered for admission to the examination. The practical examination of each geology and soil science module is compulsory to be considered for admission to the examination.

This programme prepares the student for admission to the Honours in Environmental Sciences with specialisation in Environmental Geology. The programme is compiled for a niche market in South Africa in Environmental Geology, presented at the NWU. /

'n Grond-karteringskamp, wat tydens die winterreses plaasvind, is verpligtend vir tweedejaar grondkundestudente (dit is studente wat geregistreer het vir GDKN221). Tweedejaarstudente moet 'n grondkaart en 'n verslag inhandig waarvan die punt deel sal uitmaak van die praktiese punt vir GDKN221. Derdejaar geologiese studente (dit is studente wat geregistreer het vir GLGN321) moet in lente reses periode 'n verpligte geologie-karteringskamp bywoon. 'n Geologiese kaart en verslag moet tydens die tweede semester ingehandig word en die punt daarvoor sal deel uitmaak van die praktiese punt vir GLGN321. GEEN verskonings vir afwesigheid van hierdie karteringskamp sal aanvaar word nie. In die geval van siekte, berus die onus op die student om die werk in te haal en die vereiste werkopdragte, kaarte en verslae, soos van toepassing, in te handig om in aanmerking te kom vir toelating tot die eksamen. Die praktiese eksamen in elke geologie en grondkunde module is verpligtend vir alle studente om in aanmerking te kom vir toelating tot die eksamen. Hierdie program berei die student vir toelating tot die Honneurs in Omgewingswetenskappe, met spesialisering in Omgewingsgeologie, voor. Die program is saamgestel vir 'n nismark in Suid-Afrika in Omgewingsgeologie, wat by die NWU aangebied word.

NAS.1.20.7.2 Programme: Bachelor of Science in Environmental Sciences with Geology and Chemistry / Baccalaureus Scientiae in Omgewingswetenskappe met Geologie en Chemie

CODE/ KODE: 2DJ H07- N302P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (2018 Only 1st & 2nd yrs) / NUWE PROGRAM (2018 Slegs 1st & 2^{de} jrs)

Compilation of this programme: There will be a limited intake of students majoring in Geology due to capacity restrictions. The practical examination of each geology and soil science module is compulsory to be considered for admission to the examination. / Samestelling van hierdie program: Daar sal 'n beperkte inname wees van studente met geologie as hoofvak vanweë kapasiteitsbeperkings. Die praktiese eksamen in elke geologie en grondkunde module is verpligtend vir alle studente om in aanmerking te kom vir toelating tot die eksamen.

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GLGN112	H	12	GLGN211	H	16	GLGN311	H	32
NCHE111	H	12	NCHE211 & NCHE212	H	8 8	NCHE311	H	16
MTHS114	X	12	GDKN211	X	16	NCHE312	H	16
FSKS113	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GLGN122	H	12	GLGN221	H	16	GLGN321	H	32
NCHE121	H	12	NCHE221 & NCHE222	H	8 8	NCHE321	H	16
GDKN121	X	12	GDKN221	X	16	NCHE322	H	16
MTHS124	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.7.3 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Curriculum / Kurrikulum: Geology and Chemistry / *Geologie en Chemie*

NAS.1.20.7.3.1 Faculty-specific rules for the programme / Fakulteitspesifieke reëls vir die program:

See NAS1.20.7.1 / Sien NAS1.20.7.1

CODE/ KODE : 2DJ H07 - N301P: (3rd yrs / 3^{de} jrs): BSc in Environmental Sciences with Geology and Chemistry / *BSc in Omgewingswetenskappe met Geologie en Chemie*

CODE/ KODE: 200118 - N180P: (Pipeline only / Slegs Pyplyn): BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GLGN112	H	12	GLGN211	H	16	GLGN311	H	32
CHEM111		12	CHEM211 & CHEM212	H	8	CHEM311	H	16
WISN111	X	12	GDKN211	X	16	CHEM312	H	16
FSKS113	X	12	WVNS211	X	12			
AGLA111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/T weede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GLGN122	H	12	GLGN221	H	16	GLGN321	H	32
CHEM121	H	12	CHEM222 & CHEM223	H	8 8	CHEM321	H	16
GDKN121	X	12	GDKN221	X	16	CHEM322	H	16
WISN121	X	12	WVNS221	X	12			
AGLA121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.8 Programme: Bachelor of Science in Environmental Sciences with Geology and Microbiology / Baccalaureus Scientiae in Omgewingswetenskappe met Geologie en Mikrobiologie

CODE/ KODE : 2DJ H09 - N301P

CODE/ KODE: 200118 - N181P: (Pipeline only / Slegs Pyplyn): BSc in Environmental and Biological Sciences / BSc in Omgewings- en Biologiese Wetenskappe

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English),

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

There will be a limited intake of students majoring in Geology due to capacity restrictions. The practical examination of each geology and soil science module is compulsory to be considered for admission to the examination. / Daar sal 'n beperkte inname wees van studente met geologie as hoofvak vanweë kapasiteitsbeperkings Die praktiese eksamen in elke geologie en grondkunde module is verpligtend vir alle studente om in aanmerking te kom vir toelating tot die eksamen.

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GLGN112	H	12	GLGN211	H	16	GLGN311	H	32
NCHE111	X	12	GDKN211	X	16	MKBS313	H	16
FSKS113	X	12	MKBN211	H	16	MKBS314	H	16
PLKS111 OR/OF DRKS111	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GLGN122	H	12	GLGN221	H	16	GLGN321	H	32
GDKN121	X	12	GDKN221	X	16	MKBS325	H	32
NCHE121	X	12	MKBS221	H	16			
PLKS121 OR/OF DRKS121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.9 Programme: Bachelor of Science in Environmental Sciences with Geology and Botany / Baccalaureus Scientiae in Omgewingswetenskappe met Geologie en Plantkunde

CODE/ KODE : 2DJ H02 - N301PCODE/ KODE : 200118 - N148P: (Pipeline only / Slegs Pyplyn): BSc in Environmental and Biological Sciences / BSc in Omgewings- en Biologiese Wetenskappe

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYD

Compilation of programme / Samestelling van program:

There will be a limited intake of students majoring in Geology due to capacity restrictions. The practical examination of each geology and soil science module is compulsory to be considered for admission to the examination. / Daar sal 'n beperkte inname wees van studente met geologie as hoofvak vanweë kapasiteitsbeperkings Die praktiese eksamen in elke geologie en grondkunde module is verpligtend vir alle studente om in aanmerking te kom vir toelating tot die eksamen.

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS111	H	12	PLKN213	H	16	PLKS312	H	32
GLGN112	H	12	GLGN211	H	16	GLGN311	H	32
NCHE111	X	12	GDKN211	X	16			
FSKS113	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
PLKS121	H	12	PLKS221	H	16	PLKN323	H	32
GLGN122	H	12	GLGN221	H	16	GLGN321	H	32
GDKN121	X	12	GDKN221	X	16			
NCHE121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.10 Programme: Bachelor of Science in Environmental Sciences with Zoology and Geology / *Baccalaureus Scientiae in Omgewingswetenskappe met Dierkunde en Geologie*

CODE/ KODE: 2DJ H08 - N301P

CODE/ KODE: 200118 – N182P: (Pipeline only / *Slegs Pyplyn*): BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

There will be a limited intake of students majoring in Geology due to capacity restrictions. The practical examination of each geology and soil science module is compulsory to be considered for admission to the examination. / Daar sal 'n beperkte inname wees van studente met geologie as hoofvak vanweë kapasiteitsbeperkings Die praktiese eksamen in elke geologie en grondkunde module is verpligtend vir alle studente om in aanmerking te kom vir toelating tot die eksamen.

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS111	H	12	DRKN211	H	16	DRKS311	H	32
GLGN112	H	12	GLGN211	H	16	GLGN311	H	32
NCHE111	X	12	GDKN211	X	16			
PLKS111 OR/OF FSKS113	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS121	H	12	DRKS221	H	16	DRKN321	H	16
GLGN122	H	12	GLGN221	H	16	DRKS322	H	16
GDKN121	X	12	GDKN221	X	16	GLGN321	H	32
NCHE121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.11 Programme: Bachelor of Science in Environmental Sciences with Zoology and Geography / Baccalaureus Scientiae in Omgewingswetenskappe met Dierkunde en Geografie

CODE/ KODE: 2DJ H05 - N302P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program

NEW PROGRAMME (2018 Only 1st & 2nd yrs) / NUWE PROGRAM (2018 Slegs 1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS111	H	12	DRKN211	H	16	DRKS311	H	32
GEOG111	H	12	GEOG211	H	16	GEOG311	H	32
NCHE111	X	12	PLKN213 OR/OF FLGX213	X	16			
FLGX113 OR/OF PLKS111	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS121	H	12	DRKS221	H	16	DRKN321	H	16
GEOG121	H	12	GEOG221	H	16	DRKS322	H	16
NCHE121	X	12	PLKS221 OR/OF FLGX223 & FLGX224	X	16	GEOG321	H	32
FLGX123 OR/OF PLKS121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.11.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Programme / Program: Zoology and Geography / Dierkunde en Geografie

CODE/ KODE: 2DJ H05 - N301P: (3rd yrs / 3^{de} jrs): BSc in Environmental Sciences with Zoology and Geography/ *BSc in Omgewingswetenskappe met Dierkunde en Geografie*

CODE/ KODE: 200118 – N162P (Pipeline only / *Slegs Pyplyn*): BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS111	H	12	DRKN211	H	16	DRKS311	H	32
GGFS112	H	12	GGFS212	H	16	GGFS312	H	32
CHEM111	X	12	PLKN213 OR/OF FLGX213	X	16			
FLGX113 OR/OF PLKS111 OR/OF *FSKS113	X	12	WVNS211	X	12			
AGLA111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS121	H	12	DRKS221	H	16	DRKN321	H	16
GGFS121	H	12	GGFS222	H	16	DRKS322	H	16
CHEM121	X	12	PLKS221 OR/OF FLGX223 & FLGX224	X	16	GGFS322	H	32
FLGX123 OR/OF PLKS121 OR/OF *FSKS123	X	12	WVNS221	X	12			
AGLA121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.12 Programme: Bachelor of Science in Environmental Sciences with Geology and Geography / Baccalaureus Scientiae in Omgewingswetenskappe met Geologie en Geografie

NAS.1.20.12.1 Faculty-specific rules for the programme / Fakulteitspesifieke reëls vir die program

See also/ Sien ook NAS1.20.7.1

CODE/ KODE: 2DJ H01 - N302P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

There will be a limited intake of students majoring in Geology due to capacity restrictions. The practical examination of each geology and soil science module is compulsory to be considered for admission to the examination. / Daar sal 'n beperkte inname wees van studente met geologie as hoofvak vanweë kapasiteitsbeperkings Die praktiese eksamen in elke geologie en grondkunde module is verpligtend vir alle studente om in aanmerking te kom vir toelating tot die eksamen.

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GLGN112	H	12	GLGN211	H	16	GLGN311	H	32
GEOG111	H	12	GEOG211	H	16	GEOG311	H	32
NCHE111	X	12	GDKN211	X	16			
FSKS113	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GLGN122	H	12	GLGN221	H	16	GLGN321	H	32
GEOG121	H	12	GEOG221	H	16	GEOG321	H	32
GDKN121	X	12	GDKN221	X	16			
NCHE121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

**NAS.1.20.12.2 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT)PC:
Programme / Program: Geology and Geography/ *Geologie en Geografie***

CODE/ KODE: 2DJ H01- N301P: (3rd yrs / 3^{de} jrs): BSc in Environmental Sciences with Geology and Geography/ *BSc in Omgewingswetenskappe met Geologie en Geografie*

CODE/ KODE: 200118 – N147P: (Pipeline only / Slegs Pyplyn): BSc in Environmental and Biological Sciences / *BSc in Omgewings- en Biologiese Wetenskappe*

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:*

There will be a limited intake of students majoring in Geology due to capacity restrictions. The practical examination of each geology and soil science module is compulsory to be considered for admission to the examination. / *Daar sal 'n beperkte inname wees van studente met geologie as hoofvak vanweë kapasiteitsbeperkings Die praktiese eksamen in elke geologie en grondkunde module is verpligtend vir alle studente om in aanmerking te kom vir toelating tot die eksamen.*

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GLGN112	H	12	GLGN211	H	16	GLGN311	H	32
GGFS112	H	12	GGFS212	H	16	GGFS312	H	32
CHEM111	X	12	GDKN211	X	16			
FSKS113	X	12	WVNS211	X	12			
AGLA111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GLGN122	H	12	GLGN221	H	16	GLGN321	H	32
GGFS121	H	12	GGFS222	X	16	GGFS322	H	32
GDKN121	X	12	GDKN221	H	16			
CHEM121	X	12	WVNS221	X	12			
AGLA121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.13 Programme: BSc in Environmental Sciences with Geography and Botany / BSc in Omgewingswetenskappe met Geografie en Plantkunde

CODE/ KODE: 2DJ H06 - N302P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English) and Mafikeng (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme See also NAS1.20.7.1 / Samestelling van program NAS1.20.7.1

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GEOG111	H	12	GEOG211	H	16	GEOG311	H	32
PLKS111	H	12	PLKN213	H	16	PLKS312* OR/OF PLKS313**	H	32
NCHE111	X	12	DRKN211 OR/OF **MKBN211 ***GDKN211	X	16			
*DRKS111 OR/OF *GLGN112 OR/OF **MCBN111	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1st semester		60	Total / Totaal 1st semester		60	Total / Totaal 1st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GEOG121	H	12	GEOG221	H	16	GEOG321	H	32
PLKS121	H	12	PLKS221	H	16	PLKN323* OR/OF PLKN324**	H	32
NCHE121	X	12	DRKS221 OR/OF **MKBS221 ***GDKN221	X	16			
*DRKS121 OR/OF *GLGN122 ***GDKN121 OR/OF **MCBN121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2nd semester		60	Total / Totaal 2nd semester		60	Total / Totaal 2nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

* DRKS/GLGN Can only be taken on the Potchefstroom campus/ Kan slegs op die Potchefstroomkampus geneem word. / *GLGN112/122 No elective is available at level 2./ GLGN112/122 - daar is nie 'n keusemodule op vlak 2 nie.

MCBN,MKBN/S;PLKN324/PLKS313 Can only be taken on the Mafikeng campus/ Kan slegs op Mafikeng geneem word. *GDKN(PC) can be taken as elective due to timetable clashes with MKBS. / ***GDKN (PC) kan as keusemodule geneem word a.g.v. roosterbotsings met MKBS.

NAS.1.20.13.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Programme / Program: Geography and Botany/ Geografie en Plantkunde

See also NAS1.20.7.1 / Sien ook NAS1.20.7.1

CODE/ KODE: 2DJ H06 - N301P: (3rd yrs / 3^{de} jrs): BSc in Environmental Sciences with Geography and Botany / BSc in Omgewingswetenskappe met Geografie en Plantkunde

CODE/ KODE: 200118 - N165P: (Pipeline only / Slegs Pyplyn): BSc in Environmental and Biological Sciences / BSc in Omgewings- en Biologiese Wetenskappe

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYD

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GGFS112	H	12	GGFS212	H	16	GGFS312	H	32
PLKS111	H	12	PLKN213	H	16	PLKS312	H	32
CHEM111	X	12	DRKN211 OR/OF **MKBN211 GDKN211	X	16			
DRKS111 OR/OF *FSKS113 OR/OF *GLGN112	X	12	WVNS211	X	12			
AGLA111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GGFS121	H	12	GGFS222	H	16	GGFS322	H	32
PLKS121	H	12	PLKS221	H	16	PLKN323	H	32
CHEM121	X	12	DRKS221 OR/OF **MKBS221 GDKN221	X	16			
DRKS121 OR/OF *FSKS123 OR/OF *GLGN122 **GDKN121	X	12	WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

**GDKN can be taken as elective due to timetable clashes with MKBS211/221. / GDKN kan geneem word as keuse opsie agv roosterbotsings met MKBS211/221.

NAS.1.20.14 Programme: BSc in Environmental Sciences with Geography and Computer Science / BSc in Omgewingswetenskappe met Geografie en Rekenaarwetenskap

CODE/ KODE: 2DJ H14 - N301P; N301M

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Mafikeng (English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:* See also/sien ook NAS1.20.7.1
NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GEOG111	H	12	GEOG211	H	16	GEOG311	H	32
CMPG111	H	12	CMPG211	H	16	CMPG311	H	16
GLGN112 OR/OF MTHS114**	X	12	PLKN213 OR/OF GLGN211	X	16	CMPG313** OR/OF CMPG315*	H	16
***STTN111 OR/OF PLKS111	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
GEOG121	H	12	GEOG221	H	16	GEOG321	H	32
CMPG121	H	12	CMPG221	H	8	CMPG324	H	16
GLGN122 OR/OF MTHS124**	X	12	CMPG222* OR/OF CMPG224**	H	8	CMPG321* OR/OF CMPG325**	H	16
***STTN121 OR/OF PLKS121	X	12	PLKS221 OR/OF GLGN221	X	16			
ALDE/A122	X	12	WVNS221	X	12			
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

***Take note:STTN111/121 only for PC students - No elective is available at level 2 for STTN.

CMPG222/224- PC does 222 and MC does 224**. / CMPG222/224- PK doen 222* en MK doen 224**.

CMPG313/315* MC should take CMPG313/ **CMPG313/315* maar MC moet CMPG313** neem.

In the 2nd semester of the 3rd yr PC does CMPG321* and MC does CMPG325. / In die 2de semester van die 3de jr, doen PK CMPG321* en MK doen CMPG325**.

**MTHS114/124 Only for MC students **Geology not available on MC

NAS.1.20.14.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Curriculum / Kurrikulum: Geography and Computer Science/ Geografie en
Rekenaarwetenskap

CODE/ KODE: 200118 – N166P (3rd yrs / 3^{de} jrs): BSc in Environmental and Biological Sciences / BSc in Omgewings- en Biologiese Wetenskappe

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program **N166P** : See also/sien ook NAS1.20.7.1

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLE/A111	X	12	GGFS212	H	16	GGFS312	H	32
GGFS112	H	12	ITRW212	H	16	ITRW311	H	16
ITRW112	H	12	PLKN213 OR GLGN211	X	16	ITRW316	H	16
GLGN112	X	12	WVNS211	X	12			
*STTN111 OR/OF PLKS111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
AGLE/A121	X	12	GGFS222	H	16	GGFS322	H	32
GGFS121	H	12	ITRW222	H	16	ITRW321	H	16
ITRW124	H	12	PLKS221 OR/OF GLGN221	X	16	ITRW322	H	16
GLGN122	X	12	WVNS221	X	12			
*STTN121 OR PLKS121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

*Take note STTN111/121 no elective is available at level 2 for STTN.

**NAS.1.20.14.2 OLD PROGRAMME only senior students (PHASING OUT) MC:
Curriculum: Geography and Computer Science**

CODE: 200178 – (3rd yrs / 3^{de} jrs): BSc in Geography-Computer Science

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme **N301M**

***Core modules are indicated with (H) and ancillary modules with (X)**

Year level 1			Year level 2			Year level 3		
First semester			First semester			First semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
GEOM 113	H	12	GEOM 214	H	8	GEOM 316	H	16
CISM 112	H	12	GEOM 215	H	8	GEOM 317	H	16
MAYM 117	X	12	CISM 213	H	8	CISM 313	H	16
STFM 111	X	12	CISM 214	H	8	CISM 314	H	16
AGLE 111	X	12	MAYM 217	X	16			
			WVNS 211	X	12			
Total 1 st Semester		60	Total 1 st semester		60	Total 1 st semester		64
Year level 1			Year level 2			Year level 3		
Second semester			Second semester			Second semester		
Module code	CORE	Cr	Module code	CORE	Cr	Module code	CORE	Cr
GEOM 123	H	12	GEOM 224	H	8	GEOM 328	H	16
CISM 124	H	12	GEOM 225	H	8	GEOM 329	H	16
MAYM 127	X	12	CISM 225	H	8	CISM 326	H	16
STFM 121	X	12	CISM 226	H	8	CISM 327	H	16
AGLE 121	X	12	MAYM 227	X	16			
			WVNS 222	X	12			
Total 2 nd semester		60	Total 2 nd semester		60	Total 2 nd semester		64
Total year level 1		120	Total year level 2		120	Total year level 3	128	
Total credits for the programme								368

NAS.1.20.15 BSc Programme/ Program: Bachelor of Science in Environmental Sciences with Tourism and Zoology / Baccalaureus Scientiae in Omgewingswetenskappe met Toerisme en Dierkunde

CODE/ KODE: 2DJ H15 - N301P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDYS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
DRKS111	H	12	DRKN211	H	16	DRKS311	H	32
TMBP111	H	12	TMBP211	H	16	TMBP311	H	16
GEOG 111 OR/OF PLKS111	X	12	GEOG 211 OR/OF PLKN213	X	16	TMBP312	H	16
NCHE111	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
BMAN121	H	12	TMBP221	H	16	TMBP321	H	16
GEOG 121 OR/OF PLKS121	X	12	GEOG 221 OR/OF PLKS221	X	16	TMBP322	H	16
DRKS121	H	12	DRKS221	H	16	DRKN321	H	16
NCHE121	X	12	WVNS221	X	12	DRKS322	H	16
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

**NAS.1.20.15.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Curriculum / kurrikulum: BSc Tourism-Geography-Zoology / Toerisme-
Geografie-Dierkunde**

CODE/ KODE: 200119 : (3rd yrs / 3^{de} jrs): BSc in Tourism/ BSc in Toerisme

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program **N173P**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
TMBP111	H	12	TMBP211	H	16	TMBP311	H	16
GGFS112	H	12	GGFS212	H	16	TMBP312 OR/OF DRTS311**	H	16
DRKS111	H	12	DRKN211	H	16	GGFS312	H	32
CHEM111	X	12	WVNS211	X	12			
AGLE111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
BMAN121	H	12	TMBP221	H	16	TMBP321	H	16
GGFS121	H	12	GGFS222	H	16	GGFS322	H	32
DRKS121	H	12	DRKS221	H	16	TMBP322 OR/OF DRKS322	H	16
CHEM121	X	12	WVNS221	X	12			
AGLE121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

****Selection possibilities depend on the student's choice for postgraduate studies: Zoology/Tourism. If students consider postgraduate study in Environmental Sciences, DRKS311 should be selected.**

Students who fail GGFS211 in 2013 will have to pass GGFS222.

Students who fail GGFS221 in 2013 will have to pass GGFS212. /

****Keuse wat uitgeoefen kan word na gelang van student se keuse vir nagraadse studie: Dierkunde / Toerisme. Indien student nagraadse studies in Omgewingswetenskappe oorweeg, moet DRKS311 geneem word.**

Studente wat nie GGFS211 in 2013 geslaag het nie, moet GGFS222 slaag.

Studente wat nie GGFS221 in 2013 geslaag het nie, moet GGFS212 slaag.

NAS.1.20.16 Programme: Bachelor of Science in Environmental Sciences with Tourism and Geography / Baccalaureus Scientiae in Omgewingswetenskappe met Toerisme en Geografie

CODE/ KODE: 2DJ H16 - N301P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
TMBP111	H	12	TMBP211	H	16	TMBP311	H	16
GEOG111	H	12	GEOG211	H	16	TMBP312	H	16
PLKS111 OR/OF DRKS111	X	12	PLKN213 OR/OF DRKN211	X	16	GEOG311	H	32
NCHE111	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
BMAN121	H	12	TMBP221	H	16	TMBP321	H	16
GEOG121	H	12	GEOG221	H	16	TMBP322	H	16
PLKS121 OR/OF DRKS121	X	12	PLKS221 OR/OF DRKS221	X	16	GEOG321	H	32
NCHE121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

NAS.1.20.16.1 **OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:**
Curriculum / kurrikulum: BSc Tourism-Geography-Botany / Toerisme-Geografie-Plantkunde

CODE/ KODE: 200119: (3rd yrs / 3^{de} jrs): BSc in Tourism/ BSc in Toerisme

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program **N172P**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
TMBP111	H	12	TMBP211	H	16	TMBP311	H	16
GGFS112	H	12	GGFS212	H	16	TMBP312	H	16
PLKS111	H	12	PLKN213	H	16	GGFS312	H	32
CHEM111	X	12	WVNS211	X	12			
AGLE111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
BMAN121	H	12	TMBP221	H	16	TMBP321	H	16
GGFS121	H	12	GGFS222	H	16	GGFS322	H	32
PLKS121	H	12	PLKS221	H	16	PLTN323	H	24
CHEM121	X	12	WVNS221	X	12			
AGLE121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		72
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		136
Total credits for the programme / Totaal krediete vir die program								376

NAS.1.20.17 Programme: Bachelor of Science in Environmental Sciences with Tourism and Botany / Baccalaureus Scientiae in Omgewingswetenskappe met Toerisme en Plantkunde

CODE/ KODE 2DJ H17 - N301P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
TMBP111	H	12	TMBP211	H	16	TMBP311	H	16
DRKS111 OR/OF GEOG111	X	12	DRKN211 OR/OF GEOG211	X	16	TMBP312	H	16
PLKS111	H	12	PLKN213	H	16	PLKS312	H	32
NCHE111	X	12	WVNS211	X	12			
ALDE/A111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
BMAN121	H	12	TMBP221	H	16	TMBP321	H	16
DRKS121/ OR/OF GEOG121	X	12	DRKS221 OR/OF GEOG221	X	16	TMBP322	H	16
PLKS121	H	12	PLKS221	H	16	PLKN323	H	32
NCHE121	X	12	WVNS221	X	12			
ALDE/A122	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								368

**NAS.1.20.17.1 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC:
Curriculum / kurrikulum: BSc Tourism-Zoology-Botany / Toerisme-
Dierkunde-Plantkunde**

CODE/ KODE: 200119 : (3rd yrs / 3^{de} jrs): BSc in Tourism/ BSc in Toerisme

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program **N171P:**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
TMBP111	H	12	TMBP211	H	16	TMBP311	H	16
DRKS111	H	12	DRKN211	H	16	TMBP312	H	16
PLKS111	H	12	PLKN213	H	16	DRKS311	H	32
CHEM111	X	12	WVNS211	X	12			
AGLE111	X	12						
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
BMAN121	H	12	TMBP221	H	16	TMBP321	H	16
DRKS121	H	12	DRKS221	H	16	TMBP322	H	16
PLKS121	H	12	PLKS221	H	16	DRKS322	H	16
CHEM121	X	12	WVNS221	X	12	PLTN323	H	24
AGLE121	X	12						
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		72
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		120	Total year level / Totaal jaarvlak 3		136
Total credits for the programme / Totaal krediete vir die program								376

NAS.1.21 BACHELOR OF SCIENCE IN THE CENTRE FOR BUSINESS MATHEMATICS AND INFORMATICS / BACCALAUREUS SCIENTIAE IN DIE SENTRUM VIR BEDRYFSWISKUNDE EN INFORMATIKA

a) Articulation possibilities / Artikulasiemoontlikhede

The programme grants admission to postgraduate studies in Hons BSc(BMI) programmes and may also grant admission to honours studies in Economics, Statistics or Computer Science. The honours BSc(BMI) programmes are subject to the following requirements: /

Die program gee toelating tot nagraadse studie in die Honneurs BSc (BWI)-programme en kan ook toelating gee tot honneursstudie in Ekonomie, Statistiek of Rekenaarwetenskap. Die Honneurs BSc (BWI) programme is onderhewig aan die volgende vereistes:

Honours curriculum / Honneurs kurrikulum	Graduate curriculum / Voorgraadse kurrikulum
BSc Hons in Actuarial Science / <i>Aktuariële Wetenskap</i>	Actuarial Science / <i>Aktuariële Wetenskap</i> (with five exemptions / <i>met vyf vrystellings</i>)
BSc Hons in Quantitative Risk Management / <i>Kwantitatiewe Risikobestuur</i>	Quantitative Risk Management / <i>Kwantitatiewe Risikobestuur</i> or/of Financial Mathematics / <i>Finansiële Wiskunde</i> or/of Actuarial Science / <i>Aktuariële Wetenskap</i>
BSc Hons in Financial Mathematics / <i>Finansiële Wiskunde</i>	Financial Mathematics / <i>Finansiële Wiskunde</i>
BSc Hons in Business Analytics / <i>Bedryfsanalise</i>	Quantitative Risk Management / <i>Kwantitatiewe Risikobestuur</i> or/of Financial Mathematics / <i>Finansiële Wiskunde</i> or/of Business Analytics/ <i>Bedryfsanalise</i> or/of Actuarial Science / <i>Aktuariële Wetenskap</i>

NAS.1.21.1 Admission requirements of the Qualification / Toelatingsvereistes vir die kwalifikasie

See paragraph NAS.1.16.3 / *Kyk paragraaf NAS.1.16.3*

Mathematics Refresher course / Wiskunde-opknapkursus

Before the classes start in the beginning of the year, there will be a refresher course for Mathematics. All students that enrol for curriculums where the module MTHS111 appears, are strongly recommended to complete the refresher course. /

Voor die aanvang van klasse aan die begin van die jaar, word 'n opknapkursus vir Wiskunde aangebied. Alle studente wat inskryf vir kurrikulums waarin die module MTHS111 voorkom, word sterk aanbeveel om die opknapkursus te voltooi.

Permission requirements for all Business Mathematics and Informatics courses (Actuarial Science, Financial Mathematics, Business Analytics, Quantitative Risk Management), Mathematics 70-79% (level 6), APS Score 32. / *Toelatingsvereistes vir*

alle Bedryfswiskunde en Informatika-programme (Akruariële Wetenskap, Finansiële Wetenskap, Bedryfsanalise, Kwantitatiewe Risikobestuur): Wiskunde 70% - 79% (vlak 6), APS Telling 32.

**The following is only relevant to students in the Actuarial Science programme/
Die volgende het slegs betrekking op studente in die Aktuariële Wetenskapprogram:**

- If a student does not obtain a final mark of at least 60% for both BWIA121 and STTN125 in the first year of registration, then the student may not continue with the Actuarial Sciences, 2nd year curriculum. / *Indien 'n student nie 'n finale punt van ten minste 60% vir beide BWIA121 en STTN125 in die eerste jaar van studie behaal nie, mag 'n student nie voortgaan met die 2de jaar kurrikulum van Aktuariële Wetenskap nie.*
- If a 2nd year student does not pass BWIA271 in the first year of registration, then the student may not continue with the Actuarial Sciences, 3rd year curriculum. / *Indien 'n 2e jaar student nie BWIA271 in die eerste jaar van registrasie slaag nie, mag die student nie voortgaan met die 3de jaar kurrikulum van Aktuariële Wetenskap nie.*
- If a 3rd year student fails or discontinue any of the following modules: BWIA313, BWIA314, BWIA324, BWIA371 in the first year of registration, then the student may not continue with the Actuarial Sciences curriculum. / *Indien 'n 3e jaar student enige van die volgende modules: BWIA313, BWIA314, BWIA324, BWIA371 in die eerste jaar van registrasie staak of nie slaag nie, mag die student nie voortgaan met die Aktuariële Wetenskap kurrikulum nie.*

In any of the above events the student must discuss the matter with either the Nominated Accreditation Actuary or Director of the Centre for BMI. /

In enige van bogenoemde gevalle, moet die student die Direkteur of die Genomineerde Akkreditasie Aktuaris van die Sentrum vir BWI, oor die saak spreek.

NAS.1.21.2 PROGRAMME / PROGRAM: Bachelor of Science in Quantitative Risk Management / *Baccalaureus Scientiae in Kwantitatiewe Risikobestuur*

CODE/ KODE: 2FT H01 - N301P; N301V

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Vaaltriangle (English see also NAS 1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:*

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (2 1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCF111	H	16	ECON211	H	16	BWIA313	H	24
BWIA111	X	12	EKRP211	H	16	EKRP311	H	16
ECON112	H	12	STTN215	H	16	STTN316	H	24
CMPG111	X	12	MTHS211	X	8	STTN317	H	8
STTN115	H	12	MTHS212	X	8	WVES311	X	12
MTHS111	X	12						
Total / Totaal 1 st semester		76	Total / Totaal 1 st semester		64	Total / Totaal 1 st semester		84
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCF121	H	16	EKRP221	H	16	BWIN321	H	16
ALDE122 / ALDA112*	X	12	STTN225	H	16	EKRP321	H	16
BWIA121	H	12	APPM222	X	8	STTN326	H	16
ECON122	H	12	MTHS222	X	8	STTN327	H	16
CMPG122	X	12	WVES221	X	12			
STTN125	H	12						
MTHS121	X	12						
Total / Totaal 2 nd semester		88	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
			BWIA273	H	16			
			FINM271	H	18			
Total year level / Totaal jaarvlak 1		164	Total year level / Totaal jaarvlak 2		158	Total year level / Totaal jaarvlak 3		148
Total credits for the programme / Totaal krediete vir die program								470

*Afrikaans-speaking students take ALDA112 in the 1st semester, if TALL test is passed /
Afrikaanse studente neem ALDA112 in die 1st semester, as TAG toets geslaag is.

**NAS.1.21.2.1 Programme: Bachelor of Science in Quantitative Risk Management /
Baccalaureus Scientiae in Kwantitatiewe Risikobestuur
(OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT))**

CODE/ KODE: 200166 : (3rd yrs / 3^{de} jrs)

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Vaaltriangle (English, see also NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program: **N134P;N134V**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCF111 OR ACCC111	H	16	ECON211	H	16	BWIA313	H	24
BWIA111	X	12	EKRP211	H	16	EKRP311	H	16
ECON111	H	12	STTN215	H	16	STTN316	H	24
ITRW112	X	12	WISN211	X	8	STTN317		8
STTN115	H	12	WISN212	X	8			
WISN111	X	12	WVES311	X	12			
Total / Totaal 1 st semester		76	Total / Totaal 1 st semester		76	Total / Totaal 1 st semester		72
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCF121 OR ACCC121	H	16	EKRP221	H	16	BWIN321	H	16
AGLE121	X	12	STTN225	H	16	EKRP321	H	16
BWIA121	H	12	TGWN223	X	8	STTN326	H	16
ECON121	H	12	WISN226	X	8	STTN327	H	16
ITRW123	X	12	WVES221	X	12	FINM221	H	16
STTN125	H	12						
WISN121	X	12						
Total / Totaal 2 nd semester		88	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		80
Year Module / Jaarmodule			Year Module / Jaarmodule			Year Module / Jaarmodule		
			BWIA271	H	32			
Total year level / Totaal jaarvlak 1		164	Total year level / Totaal jaarvlak 2		168	Total year level / Totaal jaarvlak 3		152
Total credits for the programme / Totaal krediete vir die program								484

NAS.1.21.3 Programme: Bachelor of Science in Financial Mathematics / *Baccalaureus Scientiae in Finansiële Wiskunde*

CODE/ KODE: 2FS H01 - N301P; N301V

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Vaaltriangle (English see also NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program N301P; 301V*

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCS111 OR/OF ACCF111	H	16	ECON211	H	16	BWIA313	H	24
ECON112	H	12	EKRP211	H	16	STTN316	H	24
CMPG111	X	12	STTN215	H	16	STTN317	H	8
STTN115	H	12	MTHS211	H	8	MTHS311	H	16
MTHS111	H	12	MTHS212	H	8	WVES311	X	12
BWIA111	H	12						
Total / Totaal 1 st semester		76	Total / Totaal 1 st semester		64	Total / Totaal 1 st semester		84
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCS121 OR/OF ACCF121	H	16	EKRP221	H	16	BWIN321	H	16
ALDE122 / ALDA112*	X	12	STTN225	H	16	STTN326	H	16
BWIA121	H	12	APPM222	X	8	STTN327	H	16
ECON122	H	12	MTHS221	H	8	EKRP321	H	16
CMPG122	X	12	MTHS222	H	8			
STTN125	H	12	WVES221	X	12			
MTHS121	H	12						
Total / Totaal 2 nd semester		88	Total / Totaal 2 nd semester		68	Total / Totaal 2 nd semester		64
Year Module / Jaarmodule								
			BWIA273	H	16			
Total year level / Totaal jaarvlak 1		164	Total year level / Totaal jaarvlak 2		148	Total year level / Totaal jaarvlak 3		148
Total credits for the programme / Totaal krediete vir die program								460

*Afrikaans-speaking students take ALDA112 in the 1st semester, if TALL test is passed / *Afrikaanse studente neem ALDA112 in die 1st semester, as TAG toets geslaag is*

NAS.1.21.4 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT) PC & VTC. Curriculum / Kurrikulum: Financial Mathematics / Finansiële Wiskunde

CODE/ KODE: 200167 (3rd yrs / 3^{de} jrs)

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English); Vaaltriangle (English see also NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program **N135P;N135V**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCS111 OR ACCF111	H	16	ECON211	H	16	BWIA313	H	24
ECON111	H	12	EKRP211	H	16	STTN316	H	24
ITRW112	X	12	STTN215	H	16	STTN317	H	8
STTN115	H	12	WISN211	H	8	WISN314		16
WISN111	H	12	WISN212	H	8			
BWIA111	H	12	WVES311	X	12			
Total / Totaal 1 st semester		76	Total / Totaal 1 st semester		76	Total / Totaal 1 st semester		72
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCS121 OR ACCF121	H	16	EKRP221	H	16	BWIN321	H	16
AGLE121	X	12	STTN225	H	16	STTN326	H	16
BWIA121	H	12	TGWN223	X	8	STTN327	H	16
ECON121	H	12	WISN224	H	8	EKRP321	H	16
ITRW123	X	12	WISN226	H	8			
STTN125	H	12	WVES221	X	12			
WISN121	H	12						
Total / Totaal 2 nd semester		88	Total / Totaal 2 nd semester		68	Total / Totaal 2 nd semester		64
Year Module / Jaarmodule								
			BWIA271	H	32			
Total year level / Totaal jaarvlak 1		164	Total year level / Totaal jaarvlak 2		176	Total year level / Totaal jaarvlak 3		136
Total credits for the programme / Totaal krediete vir die program								476

NAS.1.21.5 Programme: Bachelor of Science in Business Analytics WITH DATA MINING / Baccalaureus Scientiae in Bedryfsanalise MET DATA-ONTGINNING

CODE/ KODE: 2FR H01 - N301P; N301V

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Vaaltriangle (English see also NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCS111 OR/OF ACCF111	H	16	CMPG211	H	16	CMPG311	H	16
BWIA111	H	12	CMPG213	H	16	CMPG312	H	16
ECON112	H	12	STTN215	H	16	CMPG313	H	16
CMPG111	H	12	MTHS211	X	8	STTN316	H	24
STTN115	H	12	MTHS212	X	8	STTN317	H	8
MTHS111	X	12				WVES311	X	12
Total / Totaal 1 st semester		76	Total / Totaal 1 st semester		64	Total / Totaal 1 st semester		92
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCS121 OR/OF ACCF121	H	16	CMPG221	H	8	CMPG321	H	16
ALDE122 / ALDA112*	X	12	STTN225	H	16	CMPG322	H	16
BWIA121	H	12	APPM222	X	8	STTN326	H	16
CMPG121	H	12	MTHS222	X	8	STTN327	H	16
CMPG122	H	12	WVES221	X	12			
STTN125	H	12						
MTHS121	X	12						
Total / Totaal 2 nd semester		88	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		64
Year Module / Jaarmodule								
			BWIA273	H	16			
Total year level / Totaal jaarvlak 1		164	Total year level / Totaal jaarvlak 2		140	Total year level / Totaal jaarvlak 3		156
Total credits for the programme / Totaal krediete vir die program								460

*Afrikaans-speaking students take ALDA112 in the 1st semester, if TALL test is passed / Afrikaanse studente neem ALDA112 in die 1st semester, as TAG toets geslaag is

NAS.1.21.6 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT)
Curriculum: Data Mining / Data-ontginning

CODE/ KODE: 200168 (3rd yrs / 3^{de} jrs): BSc in Data Mining / BSc in Data-ontginning

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English), Vaaltriangle (English see also NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program **N136P; N136V**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCS111 OR/OF ACCF111	H	16	ITRW212	H	16	ITRW311	H	16
BWIA111	H	12	ITRW213	H	16	ITRW317	H	16
ECON111	H	12	ITRW214	H	16	STTN316	H	24
ITRW112	X	12	STTN215	H	16	STTN317	H	8
STTN115	H	12	WISN211	H	8			
WISN111	X	12	WISN212	H	8			
			WVES311	X	12			
Total / Totaal 1 st semester		76	Total / Totaal 1 st semester		92	Total / Totaal 1 st semester		64
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCS121 OR/OF ACCF121	H	16	ITRW123	H	12	ITRW325	H	16
AGLA121	X	12	ITRW222	H	16	ITRW321	H	16
BWIA121	H	12	STTN225	H	16	STTN326	H	16
ECON121	H	12	TGWN223	X	8	STTN327	H	16
ITRW124	X	12	WISN226	H	8			
STTN125	H	12	WVES221	X	12			
WISN121	X	12						
Total / Totaal 2 nd semester		88	Total / Totaal 2 nd semester		72	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		164	Total year level / Totaal jaarvlak 2		164	Total year level / Totaal jaarvlak 3		128
Total credits for the programme / Totaal krediete vir die program								456

NAS.1.21.7 Programme: Bachelor of Science in Actuarial Science/ *Baccalaureus Scientiae in Aktuariële Wetenskap*

NAS.1.21.7.1 Faculty-specific rules for the programme / Fakulteitspesifieke reëls vir die program (see / sien 1.21.1)

CODE/ KODE: 2FQ H01 - N301P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:*

NEW PROGRAMME (1st & 2nd yrs) / NUWE PROGRAM (1^{ste} & 2^{de} jrs)

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCF111	H	16	ECON211	H	16	BWIA313	H	24
BWIA111	H	12	EKRP211	H	16	BWIA314	H	12
ECON112	H	12	STTN215	H	16	STTN316	H	24
CMPG111	X	12	MTHS211	X	8	STTN317	H	8
STTN115	H	12	MTHS212	X	8	WVES311	X	12
MTHS111	X	12						
Total / Totaal 1 st semester		76	Total / Totaal 1 st semester		64	Total / Totaal 1 st semester		80
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCF121	H	16	EKRP221	H	16	BWIN321	H	16
ALDE122 / ALDA112*	X	12	STTN225	H	16	STTN326	H	16
BWIA121	H	12	APPM222	X	8	STTN327	H	16
ECON122	H	12	MTHS222	X	8	BWIA324	H	12
CMPG122	X	12	WVES221	X	12			
STTN125	H	12						
MTHS121	X	12						
Total / Totaal 2 nd semester		88	Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		60
Year Module / Jaarmodule								
			BWIA272	H	24	BWIA371	H	32
			FINM271	H	18			
Total year level / Totaal jaarvlak 1		164	Total year level / Totaal jaarvlak 2		166	Total year level / Totaal jaarvlak 3		172
Total credits for the programme / Totaal krediete vir die program								502

*Afrikaans-speaking students take ALDA112 in the 1st semester, if TALL test is passed / Afrikaanse studente neem ALDA112 in die 1st semester, as TAG toets geslaag is

**NAS.1.21.8 OLD PROGRAMME (PHASING OUT) / OU PROGRAM (FASEER UIT:PC
Curriculum: Actuarial Science/ Aktuariële Wetenskap**

CODE/ KODE: 200123: (3rd yrs / 3^{de} jrs) : BSc in Actuarial Science / BSc in Aktuariële Wetenskap

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program **N137P**

Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
First/Eerste semester			First / Eerste semester			First/ Eerste semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCF111 OR ACCC111	H	16	ECON211	H	16	BWIA313	H	24
BWIA111	H	12	EKRP211	H	16	BWIA314	H	12
ECON111	H	12	STTN215	H	16	STTN316	H	24
ITRW112	X	12	WISN211	X	8	STTN317	H	8
STTN115	H	12	WISN212	X	8			
WISN111	X	12	WVES311	X	12			
Total / Totaal 1 st semester		76	Total / Totaal 1 st semester		76	Total / Totaal 1 st semester		68
Year level 1 / Jaarvlak 1			Year level 2 / Jaarvlak 2			Year level 3 / Jaarvlak 3		
Second/Tweede semester			Second/ Tweede semester			Second/ Tweede semester		
Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr	Module code/ Modulekode	CORE/ KERN	Cr/ Kr
ACCC121	H	16	EKRP221	H	16	BWIN321	H	16
AGLA121	X	12	STTN225	H	16	STTN326	H	16
BWIA121	H	12	TGWN223	X	8	STTN327	H	16
ECON121	H	12	WISN226	X	8	BWIA324	H	12
ITRW123	X	12	WVES221	X	12			
STTN125	H	12	FINM221	H	16			
WISN121	X	12						
Total / Totaal 2 nd semester		88	Total / Totaal 2 nd semester		76	Total / Totaal 2 nd semester		60
Year Module / Jaarmodule								
			BWIA271	H	32	BWIA371	H	32
Total year level / Totaal jaarvlak 1		164	Total year level / Totaal jaarvlak 2		184	Total year level / Totaal jaarvlak 3		160
Total credits for the programme / Totaal krediete vir die program								508

NAS.1.22 PROGRAMME: RULES FOR THE DEGREE BACHELOR OF SCIENCE IN URBAN AND REGIONAL PLANNING /BACCALAUREUS SCIENTIAE IN STADS- EN STREEKBEPLANNING

NAS.1.22.1 Programme outcomes / Program uitkomst

The Faculty Board of Natural and Agricultural Sciences has approved this programme, that offers professional training in urban and regional planning. In compiling this programme, possible career opportunities and our country's demand for human resources were also considered. This programme also conforms to the requirements of the South African Council for Planners (SACPLAN) and prepares the student for admission to the degree MSc Urban and Regional Planning./

Die Fakulteitsraad Natuur- en Landbouwetenskappe het hierdie program goedgekeur, wat professionele opleiding in stads- en streekbeplanning bied. Met die samestelling van hierdie kurrikulum is beroepsmoontlikhede asook ons land se behoefte aan menslike hulpbronne oorweeg. Hierdie program voldoen ook aan die vereistes van die Suid-Afrikaanse Raad vir Beplanners (SACPLAN) en berei die student voor vir toelating tot die graad MSc Stads- en Streekbeplanning.

**On completing this programme, the student should be able/
Na voltooiing van hierdie program behoort die student:**

- demonstrate a broad and systematic knowledge of and engagement in urban and regional planning, as well as an understanding of the practical application of relevant urban and regional planning techniques and other subject-specific content presented in the programme; /

’n breë en sistematiese kennis van en betrokkenheid in stads- en streekbeplanning te demonstree, asook ’n begrip van die praktiese toepassing van relevante stads- en streekbeplanningtegnieke en ander vakspesifieke inhoud wat in die program aangebied is, ten einde volhoubare ontwikkeling in stedelike en landelike omgewings te bewerkstellig;

- demonstrate the ability to use a range of specialised skills to identify, analyse and argue complex and abstract planning problems by systematically drawing on an appropriate body of knowledge, theoretically-driven arguments and applying proven solutions in an ethically responsible manner; /

die vermoë te demonstree om verskeie gespesialiseerde vaardighede te gebruik om komplekse en abstrakte beplanningsprobleme te identifiseer, te analiseer en te beredeneer deur sistematies gebruik te maak van ’n gepaste kennisbasis, teorie-gedrewe argumente en die toepassing van bewese oplossings op ’n eties verantwoordelike wyse;

- demonstrate skills in gathering, critically evaluating, accurately interpreting and managing research, professional or occupational ideas and literature in urban and regional planning, as well as to present and communicate creative findings, recommendations and solutions to problems, graphically, in writing and orally to peers and professionals by making use of appropriate computer-aided software; and

die vaardighede te demonstree om navorsing, professionele of beroepsidees en - literatuur op die gebied van stads- en streekbeplanning, te versamel, krities te evalueer, akkuraat te interpreteer en te bestuur, asook om kreatiewe bevindinge, voorstelle en probleemoplossings grafies, skriftelik en mondeling aan die hand van

gepaste rekenaargesteunde sagteware aan eweknieë en professionele persone te kommunikeer; en

- demonstrate the ability to identify and address ethical issues based on a critical reflection on the applicability of different ethical value systems within the context of urban and regional planning and planning consultation. Duration (minimum and maximum duration) /

die vermoë te demonstreeer om etiese kwessies en die toepaslikheid van verskillende etiese waardesisteme binne die konteks van stads- en streekbeplanning en beplanningskonsultasie, te identifiseer en aan te spreek by wyse van kritiese refleksie.

The minimum duration of the studies for this degree is four years and the maximum duration for completing the degree is six years. / (A-Rule 1.14)

Die minimum duur van die studie vir hierdie graad is vier jaar en die maksimum duur vir die voltooiing van die graad is ses jaar. (A-Reël 1.14)

NAS.1.22.2 Admission requirements of the qualification / Toelatingsvereistes van die program

The requirements of this qualification with regard to prior learning are described in NAS.1.1.1. Students are only admitted to the BSc in Urban and Regional Planning degree if they have been selected for admission. **A maximum of 25 candidates**, i.e. first-time university students, will be selected annually.

Die vereistes van hierdie kwalifikasie met betrekking tot vorige leer word in NAS.1.1.1 beskryf. Studente word slegs toegelaat tot die BSc in Stads- en Streekbeplanning-graad na aanleiding van keuring. 'n Maksimum van 25 kandidate, dws eerstejaarstudente, sal jaarliks gekeur word.

NAS.1.22.2.1 Faculty-specific admission requirements / Fakulteitspesifieke reëls vir Faculty-specific admission requirements / Fakulteitspesifieke reëls vir die program

See paragraph N.1.2./ Verwys na paragraaf N.1.2

NAS.1.22.3 Language medium / Taalmedium

The language of instruction for contact students in this curriculum is Afrikaans. Lectures are interpreted into English for students who are not proficient in Afrikaans. In certain modules the language of instruction is English and the lectures are interpreted into Afrikaans if requested. /

Die onderrigtaal vir kontakstudente in hierdie kurrikulum is Afrikaans. Lesings word in Engels getolk vir studente wat nie Afrikaans vaardig is nie. In sekere modules is die onderrigtaal Engels en die lesings word in Afrikaans getolk, indien dit verlang word.

NAS.1.22.4 Completion of research project / Voltooiing van navorsingsprojek

In the final year students must complete a research project (SBES 472) fulltime during the first and second semester under supervision of personnel in the respective subject group. This research project is supported by the Research Methodology module (SGSS414) as well as other core modules of the Urban and Regional Planning programme. /

In die finale jaar moet studente gedurende die eerste en tweede semester 'n navorsingsprojek (SBES 472) onder toesig van personeel in die onderskeie vakgroep voltooi. Hierdie navorsingsprojek word ondersteun deur die Navorsingsmetodologie module (SGSS414) asook ander kernmodules van die Stads- en Streekbeplanningsprogram.

Take note: The 2017 program has phased out. All pipeline (senior) students must register on the 2018 program. Recognitions will be handled by the Subject Group./

Neem kennis: Die 2017 program het uitfaseer. Alle pyplyn- (senior-) studente moet op die 2018 program registreer. Erkennings sal deur die Vakgroep hanteer word.

Replacement of modules: 2017 modules merged, will not be lectured as core modules in 2018. For transition arrangements these identified 2018 modules will be recognised in place of 2017 modules:

- SBRS211 to be replaced by SANL225.
- SSBP221 to be replaced by SRSK323 or SBSS323.
- SBRS321 to be replaced by SRSK323 or SBSS323.
- SBSS471 to be replaced by SBSS472 and SGSS414. .

GGFS222/GEOG221 prerequisite requirement does not apply to GGFS312/GEO311, for all students enrolled for the BSc Urban and Regional Planning programme. /

Vervanging van modules: 2017-modules wat saamgesmelt het, sal nie in 2018 as kernmodules aangebied word nie. Vir oorgangs-reëlings word hierdie 2018-modules erken in plaas van 2017 modules.

- SBRS211 word vervang deur SANL225.
- SSBP221 word vervang deur SRSK323 of SBSS323.
- SBRS321 word vervang deur SRSK323 of SBSS323.
- SBSS471 word vervang deur SBSS472 en SGSS414.

GGFS222/GEOG221 voorvereistes is nie van toepassing vir GGFS312/GEOG311, vir alle studente ingeskryf vir die BSc Stads- en Streekbeplanning program.

NAS.1.22.5 Programme: Bachelor of Science in Urban and Regional Planning / Baccalaureus Scientiae in Stads- en Streekbeplanning

Take note / Neem kennis: All the students (1st – 4th yr) will register for this programme (no pipeline students on old programme) / *Al die studente (1ste – 4de jaar) sal vir hierdie program registreer (geen pyplynstudente op die ou program).*

CODE/ KODE: 2FE K01 - N401P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / *Samestelling van program:*

Year level / Jaarvlak 1			Year level / Jaarvlak 2			Year level / Jaarvlak 3			Year level / Jaarvlak 4		
First / Eerste semester			First / Eerste semester			First / Eerste semester			First / Eerste semester		
Module code / Modulekode	Core / Kern	Cr/ Kr	Module code / Modulekode	Core / Kern	Cr/ Kr	Module code / Modulekode	Core / Kern	Cr/ Kr	Module code / Modulekode	Core / Kern	Cr/ Kr
SBSS111	H	12	SBES212	H	16	SBES313	H	16	SGSS414	H	16
GEOG111	H	12	GEOG211	H	16	SBRS313	H	16	SBRS411	H	16
ECON112	X	12	ECON211	X	16	SBSS313	H	16	SBSS412	H	16
MTHS114	X	12	WVNS211	X	12	GGFS312	H	32	SBSS414	H	16
STTN111	X	12									
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		80	Total / Totaal 1 st semester		64
Year level / Jaarvlak 1			Year level / Jaarvlak 2			Year level / Jaarvlak 3			Year level / Jaarvlak 4		
Second semester / Tweede semester			Second semester / Tweede semester			Second semester / Tweede semester			Second semester / Tweede semester		
Module code / Modulekode	Core / Kern	Cr/ Kr	Module code	Core / Kern	Cr/ Kr	Module Code	Core / Kern	Cr/ Kr	Module code	Core / Kern	Cr/ Kr
SBSS121	H	12	SBSS223	H	16	SBSS323	H	16	SBSS424	H	16
GEOG121	H	12	SBRS221	H	16	ECON322	X	16	SSBP421	H	16
ECON122	X	12	SANL225	H	16	SBSS321	H	16	Year module / Jaarmodule		
STTN124	X	12	ECON325	X	16	SECO321	H	16			
ALDE122/ ALDA112*	X	12	WVNS221	X	12	SRSK323	H	16	SBSS472	H	32
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		76	Total / Totaal 2 nd semester		80	Total / Totaal 2 nd semester		64
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		136	Total year level / Totaal jaarvlak 3		160	Total year level / Totaal jaarvlak 4		128
Credit Total of the curriculum / Totaal krediete vir die program										544	

*Afrikaans-speaking students take ALDA112 in the 1st semester, if TALL test is passed / *Afrikaanse studente neem ALDA112 in die 1st semester, as TAG toets geslaag is.*

NAS.1.23 PROGRAMMES: BACHELOR OF SCIENCE IN AGRICULTURE

NAS.1.23.1 Bachelor of Science in Agriculture with Agricultural Economics

NAS.1.23.2 Programme outcomes

To provide the country with qualified personnel who can work as agricultural economists and are competent in research, appraising, developing, managing and evaluating agricultural development programmes and projects towards the development of the agricultural sector, agricultural business and rural communities.

CODE: 2FD K01 – N401M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme : Agricultural Economics

NEW PROGRAMME (1st & 2nd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
MCBN111	X	12	AEXM211	H	16	AECM311	H	16	AECM411	H	08
NCHE111	X	12	AEXM212	H	08	CSPM313	X	16	AECM412	H	16
ALDE111	X	12	CSPM211	X	16	AECM313	H	16	AECM413	H	16
AECM111	H	12	ANSM211	X	16	AECM314	H	08	AECM414	H	16
MTHS114	X	12	WVNS211	X	12	AECM315	H	08	AECM415	H	16
						AECM316	H	16			
Total 1st semester		60	Total 1st semester		68	Total 1st semester		80	Total 1st semester		72
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
MCBN121	X	12	AECM221	H	08	AECM321	H	16	AECM421	H	08
NCHE121	X	12	AEXM222	H	08	AECM323	H	08	AECM422	H	16
ALDE122	X	12	CSPM221	X	16	AEXM324	X	08	AECM424	H	08
NPHY123	X	12	ANSM223	X	16	AECM325	H	08	AECM425	H	16
ANSM121	X	12	AECM223	H	08	AECM326	H	08			
			WVAS221	X	12	AECM327	H	08			
Total 2nd semester		60	Total 2nd semester		68	Total 2nd semester		56	Total 2nd semester		48
Total year level 1		120	Total year level 2		136	Total year level 3		136	Total year level 4		120
											512

NAS.1.23.3 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Bachelor of Science in Agricultural in Agricultural Economics

CODE: 267100- N401M (3rd – 4th yr students register on this programme)

CAMPUS: Mafikeng (English)

DELIVERY MODE: FULL TIME

Compilation of programme: Agricultural Economics

Year level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code/	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
BGYM113	X	12	AEXM211	H	16	AECM311	H	16	AECM411	H	8
MCHE114	X	12	AEXM212	H	8	AECM312	H	8	AECM412	H	16
AGLE111	X	12	AECM213	H	8	CSPM313	X	16	AECM413	H	16
AECM111	H	12	CSPM211	X	16	AECM313	H	16	AECM414	H	16
MAYM116	X	12	ANSM211	X	16	AECM314	H	8	AECM415	H	16
			WVNS211	X	12						
Total 1st semester		60	Total 1st semester		76	Total 1st semester		64	Total 1st semester		72
Year level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module Code	Core	Cr	Module code	Core	Cr
MCHE121	X	12	AECM221	H	8	AECM321	H	16	AECM421	H	8
BGYM123	X	12	AEXM222	H	8	AECM322	H	16	AECM422	H	16
PHYM129	X	12	CSPM221	X	16	AECM323	H	8	AECM423	H	8
ANSM121	X	12	ANSM223	X	16	AEXM324	H	8	AECM424	H	8
AGLE121	X	12	AECM223	H	8	AECM325	H	8	AECM425	H	16
			WVAS221	X	12						
Total 2nd semester		60	Total 2nd semester		68	Total 2nd semester		56	Total 2nd semester		56
Total year level 1		120	Total year level 2		144	Total year level 3		120	Total year level 4		128
Credit Total of the curriculum											512

NAS.1.23.4 Bachelor of Science in Agriculture in Animal Health

NAS.1.23.4.1 Programme outcomes:

Animal health technicians will be able to utilize their sound, research-based knowledge of disease surveillance, farm animals and production systems and be able to identify problems related to the health, breeding, feeding, management and economics of livestock production, thus contributing to animal production whilst maintaining the animals' health and welfare, protecting humans from zoonosis and ensuring high-quality food products of animal origin for human consumption.

CODE: 267 101- N402M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme: Animal Health

NEW PROGRAMME (1st & 2nd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE111	X	12	AHPM213	H	12	AHPM311	H	16	AHPM411	H	16
MCBN111	X	12	AHPM214	H	12	AHPM313	H	16	AHPM412	H	16
NCHE111	X	12	AHPM216	H	12	AHPM315	H	08	AHPM415	H	16
MTHS114	X	12	ANSM214	X	08	AHPM317	H	08	AHPM416	H	08
AECM111	X	12	AEXM211	X	16	AHPM318	H	08	AHPM417	H	08
			WVNS211	X	12	AHPM319	H	08			
						ANSM311	H	16			
Total 1st semester		60	Total 1st semester		72	Total 1st semester		80	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12	AHPM223	H	12	AHPM321	H	16	AHPM421	H	16
ANSM121	X	12	AHPM224	H	12	AHPM322	H	16	AHPM422	H	16
MCBN121	X	12	AHPM225	H	12	AHPM323	H	16	AHPM424	H	08
NCHE121	X	12	ANSM226	X	12	AHPM325	H	08	AHPM425	H	16
NPHY123	X	12	ANSM223	X	16	AHPM327	H	12	AHPM426	H	08
			ANSM224	X	08	AHPM329	H	12	AHPM427	H	08
			WVAS221	X	12	AHBM321	H	08			
Total 2nd semester		60	Total 2nd semester		84	Total 2nd semester		88	Total 2nd semester		72
Total year level 1		120	Total year level 2		156	Total year level 3		168	Total year level 4		136
Total credits for the curriculum											580

NAS.1.23.4.2 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Bachelor of Science in Agriculture in Animal Health

CODE: 267 101- N401M (3rd – 4th yr students register on this programme)

CAMPUS: Mafikeng (English)

DELIVERY MODE: FULL TIME

Compilation of programme : Animal Health

Year level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code/	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
AGLE 111	X	12	AHPM 213	H	12	AHPM 311	H	16	AHPM 411	H	16
BGYM 113	X	12	AHPM 214	H	12	AHPM 312	H	8	AHPM 412	H	16
MCHE 114	X	12	ANSM 214	X	8	AHPM 313	H	16	AHPM 413	H	8
MAYM 116	X	12	AEXM 211	X	16	AHPM 316	H	12	AHPM 414	H	8
AECM 111	X	12	WVNS 211	X	12	ANSM 311	X	16	AHPM 415	H	16
			AHPM 215	H	12	AHPM 315	H	8			
Total semester 1st		60			72			76	Total semester 1st		64
Year level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module Code	Core	Cr	Module code	Core	Cr
AGLE 121	X	12	AHPM 224	H	12	AHPM 321	H	16	AHPM 421	H	16
ANSM 121	X	12	AHPM 223	H	12	AHPM 322	H	16	AHPM 422	H	16
BGYM 123	X	12	ANSM 222	X	8	AHPM 323	H	16	AHPM 423	H	8
MCHE 121	X	12	ANSM 223	X	16	AHPM 328	H	8	AHPM 424	H	8
PHYM 129	X	12	ANSM 224	X	8	AHPM 325	H	8	AHPM 425	H	16
			WVAS 221	X	12	AHPM 327	H	12	AHPM 426	H	8
Total semester 2nd		60	Total semester 2nd		68	Total semester 2nd		76	Total semester 2nd		72
Total year level 1		120	Total year level 2		140	Total year level 3		152	Total year level 4		136
Credit Total of the curriculum											548

NAS.1.23.5 Bachelor of Science with Animal Science

The main aim of this programme is to offer an opportunity to students from different educational backgrounds to become Professional Animal Scientists within the Agricultural Sector and related industries.

CODE: 2FD K03 - N401M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme: Animal Science

NEW PROGRAMME (1st & 2nd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
NCHE111	X	12	ANSM211	H	16	AECM314	X	08	ANSM412	H	16
MCBN111	X	12	AHPM212	X	16	ANSM311	H	16	ANSM415	H	12
MTHS114	X	12	CSPM211	X	16	ANSM312	H	16	ANSM416	H	16
AECM111	X	12	AHPM211	X	16	ANSM313	H	08	ANSM479	H	32
ALDE111	X	12	WVNS211	X	12	ANSM314	H	16			
Total 1st semester		60	Total 1st semester		76			64	Total 1st semester		76
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
NCHE121	X	12	ANSM223	H	16	ANMS321	H	16	ANSM423	H	08
MCBN121	X	12	AHPM221	X	08	ANSM322	H	08	ANSM426	H	12
NPHY124	X	12	ANSM226	H	12	ANSM323	H	16	ANSM427	H	12
ANSM121	H	12	CSPM221	X	16	ANSM326	H	12	ANSM428	H	12
ALDE122	X	12	WVAS221	X	12	AHPM326	X	08			
						AEXM324	X	08			
Total 2nd semester		60	Total 2nd semester		64	Total 2nd semester		68	Total 2nd semester		44
Total year level 1		120	Total year level 2		140	Total year level 3		132	Total year level 4		120
Total credits for the curriculum											512

NAS.1.23.5.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Bachelor of Science in Agriculture - Animal Science

CODE: 267 102 - N401M (3rd – 4th yr students register on this programme)

CAMPUS: Mafikeng (English)

DELIVERY MODE: FULL TIME

Compilation of programme: Animal Science

Year level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code/	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
MCHE 114	X	12	ANSM 211	H	16	AECM 314	X	8	ANSM 411	H	16
BGYM 113	X	12	AHPM 212	X	16	ANSM 311	H	16	ANSM 412	H	16
MAYM 116	X	12	CSPM 211	X	16	ANSM 312	H	16	ANSM 413	H	16
AECM 111	X	12	AHPM 211	X	16	ANSM 313	H	8	ANSM 414	H	8
AGLE 111		12	WVNS 211	X	12	ANSM 314	H	16			
Total semester 1st		60	Total semester 1st		76	Total semester 1st		64	Total semester 1st		56
Year level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module Code	Core	Cr	Module code	Core	Cr
MCHE 121	X	12	ANSM 223	H	16	ANSM 321	H	16	ANSM 421	H	16
BGYM 123	X	12	AHPM 221	X	8	ANSM 322	H	8	ANSM 422	H	8
PHYM 129	X	12	ANSM 222	H	8	ANSM 323	H	16	ANSM 423	H	8
ANSM 121	H	12	CSPM 221	X	16	ANSM 324	H	16	ANSM 424	H	16
AGLE 121	X	12	WVAS 221	X	12	AHPM 326	X	8	ANSM 425	H	16
						AEXM 324	X	8			
Total semester 2nd		60	Total semester 2nd		60	Total semester 2nd		72	Total semester 2nd		64
Total year level 1		120	Total year level 2		136	Total year level 3		136	Total year level 4		120
Credit Total of the curriculum											512

NAS.1.23.6 Bachelor of Science in Agriculture with Agronomy and Horticulture

CODE: 2FD K04 - N401M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st & 2nd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
MCBN111	X	12	CSPM211	H	16	CSPM311	H	08	CSPM411 or CSPM416	H	08
NCHE111	X	12	AEXM211	X	16	CSPM313	H	16	CSPM411 or CSPM415	H	16
MTHS114	X	12	ANSM211	X	16	CSPM317	H	08	CSPM412 or CSPM419	H	12
ALDE111	X	12	CSPM212	H	12	CSPM319	H	08			
AECM111	X	12	CSPM213	H	08	ANSM312	X	16			
			WVNS211	X	12	AECM314	X	08			
Total 1st semester		60	Total 1st semester		80	Total 1st semester		64	Total 1st semester		36
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
MCBN121	X	12	CSPM 221	H	16	CSPM321	H	08	CSPM421	H	16
NCHE121	X	12	CSPM 222	H	16	CSPM322	H	16	CSPM425 or CSPM426	H	12
NPHY123	X	12	CSPM 223	H	12	CSPM323	H	16	Total 2nd semester		28
ALDE122	X	12	CSPM 225	H	12	CSPM324	H	16			
ANSM121	X	12	WVAS221	X	12	CSPM325	H	08	Year modules		
						CSPM326 or CSPM327	H	08	CSPM479	H	12
Total 2nd semester		60	Total 2nd semester		68	Total 2nd semester		72	CSPM474	H	32
									Total yr mod		44
Total year level 1		120	Total year level 2		148	Total year level 3		136	Total year level 4		108
Total credits for the curriculum											512

NAS.1.23.7 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Bachelor of Science in Agriculture in Crop Science

Purpose:

To provide formal education and research training in Plant Sciences and related fields such as Horticulture, Soil Science, and Environmental and Land Management towards the improvement of the agricultural sector regionally, nationally and internationally.

CODE: 267 103 - N401M (3rd – 4th yr students register on this programme)

CAMPUS: Mafikeng (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code/	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
BGYM 113	X	12	CSPM211	H	16	CSPM311	H	8	CSPM411	H	8
MCHE 114	X	12	AEXM211	X	16	CSPM312	H	16	CSMP412/ CSPM415	H	16
MAYM 116	X	12	ANSM 211	X	16	CSPM313	H	16	CSPM413/ CSPM414	H	8
AGLE 111	X	12	CSPM212	H	12	AECM314	X	8	CSPM417	H	8
AECM 111	X	12	CSPM213	H	8	ANSM312	X	16	CSPM418	H	16
			WVNS 211	X	12						
		60	Total semester 1 st		80	Total semester 1 st		64	Total semester 1 st		56
Year level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module Code	Core	Cr	Module code	Core	Cr
BGYM 123	12	X	CSPM221	H	16	CSPM321	H	8	CSPM421	H	16
MCHE 121	12	X	CSPM222	H	16	CSPM322	H	16	CSPM422/ CSPM424	H	16
PHYM 129	12	X	CSPM223	H	12	CSPM323	H	16	CSPM427	H	8
AGLE 121	12	X	CSPM224	H	16	CSPM324	H	16	CSPM428	H	16
ANSM121	12	X	WVAS221	X	12	CSPM325	H	8			
Total semester 2 nd		60	Total semester 2 nd		72	Total semester 2 nd		64	Total semester 2 nd		56
Total year level 1		120	Total year level 2		152	Total year level 3		128	Total year level 4		112
Credit Total of the curriculum											512

**NAS.1.23.8 Bachelor of Science in Agriculture with Economics and Agronomy /
Baccalaureus Scientiae in Landbou met Landbou-ekonomie en Agronomie**

CODE/ KODE: 2FD K05 - N401P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME / NUWE PROGRAM (2019: 1st yrs only/ Slegs 1^{ste} jrs)

Year level / Jaarvlak 1			Year level / Jaarvlak 2			Year level / Jaarvlak 3			*Year level/Jaarvlak 4		
First / Eerste semester			First / Eerste semester			First / Eerste semester			First / Eerste semester		
Module code/ Modulekode	Core /Kern	Cr/ Kr	Module code/ Modulekode	Core /Kern	Cr/ Kr	Module code/ Modulekode	Core /Kern	Cr/ Kr	Module code/ Modulekode	Core /Kern	Cr/ Kr
ECON112	H	12	CSPM212	H	12	AECP211	H	16	CSPM411	H	8
FSKS113	X	12	GDKN211	H	16	AECP311	H	16	ECOH611	H	16
NCHE111	X	12	STTK214	X	16	CSPM311	H	8	ECOH617	H	16
									OR/OF OMWP411		
PLKS111	X	12	WVNS211	X	12	CSPM313	H	16			
ALDE/ ALDA111	X	12				GDKN311	H	16			
Total / Totaal 1st semester		60	Total / Totaal 1st semester		56	Total / Totaal/1st semester		72	Total / Totaal 1st semester		40
Year level / Jaarvlak 1			Year level / Jaarvlak 2			Year level / Jaarvlak 3			Year level/Jaarvlak 4		
Second semester / Tweede semester			Second semester / Tweede semester			Second semester / Tweede semester			Second semester / Tweede semester		
Module code/ Modulekode	Core /Kern	Cr/ Kr	Module code/ Modulekode	Core /Kern	Cr/ Kr	Module code/ Modulekode	Core /Kern	Cr/ Kr	Module Code/ Module- kode	Core /Kern	Cr/ Kr
FSKS123	X	12	AECP121	H	12	AECP321	H	16	GDKN421	H	24
GDKN121	H	12	AECP223	H	16	AECP322	H	16	OMSA422	X	16
NCHE121	X	12	CSPM221	H	16	CSPM321	H	8	OMSA423	X	16
MTHS123	X	12	CSPM325	X	8	CSPM324	H	16	Total / Totaal 2nd semester		56
ALDE/ ALDA122	X	12	GDKN221	H	16				Year module / Jaarmodule		
			WVNS221	X	12				OMSE474	H	32
Total / Totaal 2nd semester		60	Total / Totaal 2nd semester		80	Total / Totaal 2nd semester		56	Total/Totaal Yr/Jr module		32
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		136	Total year level / Totaal jaarvlak 3		128	Total year level / Totaal jaarvlak 4		128
Credit Total of the curriculum / Totaal krediete vir die program											512

***FIELD MAPPING DURING THE DECEMBER HOLIDAY OF THE 3rd YEAR IS A PREREQUISITE FOR 4TH YEAR REGISTRATION**

**NAS.1.23.9 Bachelor of Science in Agriculture with Soil Sciences and Agronomy/
Baccalaureus Scientiae in Landbou met Grondkunde en Agronomie**

CODE/ KODE: 2FD K06 - N401P

CAMPUS/ KAMPUS: Potchefstroom (Afrikaans, English)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME / NUWE PROGRAM (2019: 1st yrs only/ Slegs 1^{ste} jrs)

Year level / Jaarvlak 1			Year level / Jaarvlak 2			Year level / Jaarvlak 3			Year level/Jaarvlak 4		
First / Eerste semester			First / Eerste semester			First / Eerste semester			First / Eerste semester		
Module code/ Modulekode	Core /Kern	Cr/ Kr	Module code/ Modulekode	Core /Kern	Cr/ Kr	Module code/ Modulekode	Core /Kern	Cr/ Kr	Module code/ Modulekode	Core /Kern	Cr/ Kr
ECON112	H	12	CSPM212	H	12	AECP211	X	16	CSPM411	H	8
FSKS113	X	12	GDKN211	H	16	CSPM311	H	8	OMSE415	X	16
NCHE111	X	12	STTK214	X	16	CSPM313	H	16	OMWP411	H	16
PLKS111	X	12	WVNS211	X	12	GDKN311	H	16			
ALDE/ ALDA111	X	12									
Total / Totaal 1 st semester		60	Total / Totaal 1 st semester		56	Total / Totaal/ 1 st semester		56	Total / Totaal 1 st semester		40
Year level / Jaarvlak 1			Year level / Jaarvlak 2			Year level / Jaarvlak 3			Year level/Jaarvlak 4		
Second semester / Tweede semester			Second semester / Tweede semester			Second semester / Tweede semester			Second semester / Tweede semester		
Module code/ Modulekode	Core /Kern	Cr/ Kr	Module code/ Modulekode	Core /Kern	Cr/ Kr	Module code/ Modulekode	Core /Kern	Cr/ Kr	Module Code/ Module- kode	Core /Kern	Cr/ Kr
FSKS123	X	12	AECP121	X	12	AECP321	X	16	GDKN421	H	24
GDKN121	H	12	AECP223	X	16	AECP322	X	16	OMSA422	X	16
NCHE121	X	12	CSPM221	H	16	CSPM321	H	8	OMSA423	X	16
MTHS123	X	12	CSPM325	X	8	GDKN322	H	16	Total / Totaal 2 nd semester		56
ALDE/ ALDA122	X	12	GDKN221	H	16	CSPM324	H	16	Year module / Jaarmodule		
			WVNS221	X	12				OMSE474	H	32
Total / Totaal 2 nd semester		60	Total / Totaal 2 nd semester		80	Total / Totaal/ 2 nd semester		72	Total/Totaal Yr/Jr module		32
Total year level / Totaal jaarvlak 1		120	Total year level / Totaal jaarvlak 2		136	Total year level / Totaal jaarvlak 3		128	Total year level / Totaal jaarvlak 4		128
Credit Total of the curriculum / Totaal krediete vir die program										512	

NAS.1.24 PROGRAMME: BACHELOR OF INDIGENOUS KNOWLEDGE SYSTEMS

NAS.1.24.1 Programme outcomes

This is a multi-disciplinary qualification which has been designed to prepare students with the necessary knowledge, skills and values of Indigenous Knowledge Systems (IKS), in order to enable them to pursue careers as practitioners in various fields and contexts.

The qualification is based on a holistic approach to understanding IKS and lays a solid foundation for learners to gain academic and practical competencies which will enable them to apply theoretical knowledge and understanding in a range of contexts which including but not limited to health sciences, traditional leadership, tourism, communication, agriculture, nature conservation, arts and culture, heritage, education, law, human and social sciences, physical planning and construction.

The multi-disciplinary nature of this qualification will enable learners to promote IKS within various communities of practice, through being conversant with the concepts, theories, philosophies and values of IKS. In addition, the structure of the qualification provides scope for electives in a domain of IKS, relevant to the student's area of interest or research. The qualification will also equip learners with sufficient research competencies to undertake postgraduate studies.

NAS.1.24.2 Programme: Bachelor of Indigenous Knowledge Systems (B. IKS)

CODE: 287 100 N402M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE111	X	12	IKSM211	H	12	WVCS315	X	16	IKSM 411	H	16
IKSM111	H	12	IKSM212	H	12	Select 3 modules from the following:			IKSM412	H	16
IKSM112	H	12	IKSM213	H	12	IKSS311	H	16	Select 1 module from the following:		
IKSM113	H	12	IKSM214	H	12	IKSS312	H	16	IKSM413	H	16
IKSM114	H	12	IKSM215	H	12	IKSA311	H	16	IKSS413	H	16
IKSM115	H	12				IKSC311	H	16	IKSA413	H	16
						IKSC312	H	16	IKSC413	H	16
						IKSH311	H	16	IKSH411	H	16
						IKSH312	H	16			
						IKSH313	H	16			
						IKSH314	H	16			
						IKSM311	H	16			
						IKSM312	H	16			
						IKSM313	H	16			
Total 1st semester		72	Total 1st semester		60			64	Total 1st semester		48
Year Level 1			Year level 2			Year level 3			Year level 4		

Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12	IKSM221	H	12	Select 4 modules from the following:	H	16	IKSM421	H	64
IKSM121	H	12	IKSM222	H	12	IKSM321	H	16			
IKSM122	H	12	IKSM223	H	12	IKSM322	H	16			
IKSM123	H	12	IKSM224	H	12	IKSM323	H	16			
IKSM124	H	12	IKSM225	H	12	IKSM324	H	16			
IKSM125	H	12	WVCS221	X	12	IKSS321	H	16			
						IKSS322	H	16			
						IKSS323	H	16			
						IKSS324	H	16			
						IKSA321	H	16			
						IKSA322	H	16			
						IKSA323	H	16			
						IKSH321	H	16			
						IKSH322	H	16			
						IKSH323	H	16			
						IKSC321	H	16			
						IKSC322	H	16			
						IKSC323	H	16			
Total 2nd semester		72	Total 2nd semester		72	Total 2nd semester		64	Total 2nd semester		64
Total year level 1		144	Total year level 2		132	Total year level 3		128	Total year level 4		112
Total credits for the curriculum											516

NAS.1.25 PROGRAMME: BSC EXTENDED PROGRAMMES

NAS.1.25.1 Faculty-specific rules for the programme

Students who have not achieved the minimum requirements for entry into BSc may be admitted into the BSc Extended (BSc-e) Programme.

NAS.1.25.2 Programme: Extended BSc WITH Applied Mathematics and Chemistry

CODE: 2XF H13 – N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st- 3rd yr students register on this programme)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
APPM171	H	12	APPM172	H	12	APPM212	H	8	APPM311	H	16
MTHS171	X	12	MTHS172	X	12	APPM213	H	8	APPM313	H	16
NCHE171	H	12	NCHE172	H	12	MTHS211	X	8	NCHE311	H	16
NPHY171	X	12	NPHY172	X	12	MTHS212	X	8	NCHE312	H	16
ALDE111	X	12				NCHE211	H	8			
						NCHE212	H	8			
						WVNS211	X	12			
								60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester						Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				APPM222	H	8	APPM322	H	16
						APPM223	H	8	APPM323	H	16
						MTHS221	X	8	NCHE321	H	16
						MTHS222	X	8	NCHE322	H	16
						NCHE221	H	8			
						NCHE222	H	8			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 2		48	Total year level 3		120	Total year level 4		128
Total credits for the curriculum											368

NAS.1.25.2.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc Applied Mathematics – Chemistry

CODE: 200 192 - N302M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFCM171	H	06	SFCM172	H	06	WVNS211	X	12	APMM317	H	16
SFMM171	X	06	SFMM172	X	06	APMM217	H	16	APMM318	H	16
SFPM171	X	06	SFPM172	X	06	MCHE215	H	8	MCHE315	H	16
SFAM171	H	06	SFAM172	H	06	MCHE216	H	8	MCHE316	H	16
AGLE111	X	12				MAYM217	X	16			
Total 1st semester		36	Total 1st semester		24			60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFCM171	H	06	SFCM172	H	06	WVNS221	X	12	APMM327	H	16
SFMM171	X	06	SFMM172	X	06	APMM227	H	16	APMM328	H	16
SFPM171	X	06	SFPM172	X	06	MCHE221	H	8	MCHE321	H	16
SFAM171	H	06	SFAM172	H	06	MCHE223	H	8	MCHE322	H	16
			AGLE121	X	12	MAYM227	X	16			
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.3 Programme: Extended BSc WITH Applied Mathematics and Electronics

CODE: 2XF H14 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
APPM171	H	12	APPM172	H	12	APPM212	H	8	APPM311	H	16
MTHS171	X	12	MTHS172	X	12	APPM213	H	8	APPM313	H	16
SFEM171	H	12	SFEM172	H	12	MTHS211	X	8	ELYM315	H	16
CMPG171	X	12	CMPG172	X	12	MTHS212	X	8	ELYM316	H	16
ALDE111	X	12				ELYM215	H	16			
						WVNS211	X	12			
								60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				APPM222	H	8	APPM322	H	16
						APPM223	H	8	APPM323	H	16
						MTHS221	X	8	ELYM327	H	16
						MTHS222	X	8	ELYM328	H	16
						ELYM227	H	16			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.3.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc Applied Mathematics – Electronics

CODE: 200 193 - N302M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	H	06	SFEM172	H	06	WVNS211	X	12	APMM317	H	16
SFMM171	X	06	SFMM172	X	06	APMM217	H	16	APMM318	H	16
SFIM171	X	06	SFIM172	X	06	ELYM215	H	16	ELYM315	H	16
SFAM171	H	06	SFAM172	H	06	MAYM217	X	16	ELYM316	H	16
AGLE111	X	12									
Total 1st semester		36	Total 1st semester		24			60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	H	06	SFEM172	H	06	WVNS221	X	12	APMM327	H	16
SFMM171	X	06	SFMM172	X	06	APMM227	H	16	APMM328	H	16
SFPM171	X	06	SFPM172	X	06	ELYM227	H	16	ELYM327	H	16
SFAM171	H	06	SFAM172	H	06	MAYM227	X	16	ELYM328	H	16
			AGLE121	X	12						
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum										368	

NAS.1.25.4 Programme: Extended BSc in Mathematical Sciences WITH Applied Mathematics and Mathematics

CODE: 2XG H03 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
APPM171	H	12	APPM172	H	12	APPM212	H	8	APPM311	H	16
MTHS171	H	12	MTHS172	H	12	APPM213	H	8	APPM313	H	16
NPHY171	X	12	NPHY172	X	12	MTHS211	H	8	MTHS311	H	16
CMPG171	X	12	CMPG172	X	12	MTHS212	H	8	MTHS312	H	16
ALDE111	X	12				NPHY211	X	8			
						NPHY212	X	8			
						WVNS211	X	12			
								60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester						Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ADLE122	X	12				APPM222	H	8	APPM322	H	16
						APPM223	H	8	APPM323	H	16
						MTHS221	H	8	MTHS321	H	16
						MTHS222	H	8	MTHS322	H	16
						NPHY221	X	8			
						NPHY222	X	8			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum:											368

**NAS.1.25.4.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Applied Mathematics – Mathematics**

CODE: 200 158 - N303M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFAM171	H	06	SFAM172	H	06	WVNS211	X	12	APMM317	H	16
SFMM171	H	06	SFMM172	H	06	APMM217	H	16	APMM318	H	16
SFPM171	X	06	SFPM172	X	06	PHYM215	X	08	MAYM317	H	16
SFIM171	X	06	SFIM172	X	06	PHYM216	X	08	MAYM318	H	16
AGLE111	X	12				MAYM217	H	16			
Total 1st semester		36	Total 1st semester		24			60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFAM171	H	06	SFAM172	H	06	WVNS221	X	12	APMM327	H	16
SFMM171	H	06	SFMM172	H	06	APMM227	H	16	APMM328	H	16
SFPM171	X	06	SFPM172	X	06	PHYM221	X	08	MAYM327	H	16
SFIM171	X	06	SFIM172	X	06	PHYM222	X	08	MAYM328	H	16
			AGLE121	X	12	MAYM227	H	16			
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.5 Programme: Extended BSc WITH Physics and Applied Mathematics

CODE: 2XF H24 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st -3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
APPM171	H	12	APPM172	H	12	APPM212	H	8	APPM311	H	16
MTHS171	X	12	MTHS172	X	12	APPM213	H	8	APPM313	H	16
NPHY171	H	12	NPHY172	H	12	MTHS211	X	8	NPHY311	H	16
CMPG171	X	12	CMPG172	X	12	MTHS212	X	8	NPHY312	H	16
ALDE111	X	12				NPHY211	H	8			
						NPHY212	H	8			
						WVNS211	X	12			
								60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester & Year Mod						Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				APPM222	H	8	APPM322	H	16
						APPM223	H	8	APPM323	H	16
						MTHS221	X	8	NPHY321	H	16
						MTHS222	X	8	NPHY322	H	16
						NPHY221	H	8			
						NPHY222	H	8			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.5.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc Applied Mathematics – Physics

CODE: 200 194- N302M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFAM171	H	06	SFAM172	H	06	WVNS211	X	12	APMM317	H	16
SFMM171	X	06	SFMM172	X	06	APMM217	H	16	APMM318	H	16
SFPM171	H	06	SFPM172	H	06	PHYM215	H	08	PHYM315	H	08
SFIM171	X	06	SFIM172	X	06	PHYM216	H	08	PHYM316	H	08
AGLE111	X	12				MAYM217	X	16	PHYM317	H	08
									PHYM318	H	08
Total 1st semester		36	Total 1st semester		24			60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFAM171	H	06	SFAM172	H	06	WVNS221	X	12	APMM327	H	16
SFMM171	X	06	SFMM172	X	06	APMM227	H	16	APMM328	H	16
SFPM171	H	06	SFPM172	H	06	PHYM221	H	08	PHYM321	H	08
SFIM171	X	06	SFIM172	X	06	PHYM222	H	08	PHYM322	H	08
			AGLE121	X	12	MAYM227	X	16	PHYM323	H	08
									PHYM324	H	08
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.6 Programme: Extended BSc WITH Biochemistry and Chemistry

NAS.1.25.6.1 Programme specific rules

Take note: To continue to mainstream Biochemistry 3rd yr, you need an average of 65% for MCBN Foundation.

CODE: 2XF H06 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
MCBN171	H	12	MCBN172	H	12	BCHN213	H	16	BCHS316	H	16
MTHS173	X	12	MTHS174	X	12	NCHE211	H	08	BCHS317	H	16
NPHY171	H	12	NPHY172	H	12	NCHE212	H	08	NCHE311	H	16
NCHE171	X	12	NCHE172	X	12	MKBN211	X	16	NCHE312	H	16
ALDE111	X	12				WVNS211	X	12			
								60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				BCHN222	H	16	BCHS321	H	16
						NCHE221	H	08	BCHS322	H	16
						NCHE222	H	08	NCHE321	H	16
						MKBS221	X	16	NCHE322	H	16
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.6.2 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc Biochemistry – Chemistry

Take note: To continue to mainstream Biochemistry 3rd yr, you need an average of 65% for MCBN Foundation.

CODE: 200 201 - N301M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFBM171	H	06	SFBM172	H	06	WVNS211	X	12	BCHS314	H	16
SFCM171	H	06	SFCM172	H	06	MKBS211	X	08	BCHS315	H	16
SFMM171	X	06	SFMM172	X	06	MKBS212	X	08	MCHE315	H	16
SFPM171	X	06	SFPM172	X	06	MCHE215	H	08	MCHE316	H	16
AGLE111	X	12				MCHE216	H	08			
						BCHS211	H	08			
						BCHS212	H	08			
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFBM171	H	06	SFBM172	H	06	WVNS221	X	12	BCHS324	H	16
SFCM171	H	06	SFCM172	H	06	MKBS222	X	08	BCHS325	H	16
SFMM171	H	06	SFMM172	H	06	MKBS223	X	08	MCHE321	H	16
SFPM171	X	06	SFPM172	X	06	MCHE221	H	08	MCHE322	H	16
			AGLE121	X	12	MCHE223	H	08			
						BCHS221	H	08			
						BCHS223	H	08			
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.7 Programme: Extended BSc in Environmental Sciences WITH Botany and Chemistry

CODE: 2XJ H03 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st -3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
MCBN171	H	12	MCBN172	H	12	BCHN213	H	16	PLKS313	H	32
MTHS173	X	12	MTHS172	X	12	NCHE211	H	08	NCHE311	H	16
PLKS171	H	12	PLKS172	H	12	NCHE212	H	08	NCHE312	H	16
NCHE171	X	12	NCHE172	X	12	PLKN213	X	16			
ALDE111	X	12				WVNS211	X	12			
								60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				BCHN222	X	16	PLKN324	H	32
						NCHE221	H	08	NCHE321	H	16
						NCHE222	H	08	NCHE322	H	16
						PLKS221	H	16			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.7.1 **OLD PROGRAMME (PHASING OUT) MC:** Curriculum: Extended BSc
Biology - Chemistry

CODE: 200 159 - N303M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFBM171	H	06	SFBM172	H	06	WVNS211	X	12	BGYM313	H	16
SFCM171	H	06	SFCM172	H	06	BGYM213	H	08	BGYM314	H	16
SFMM171	X	06	SFMM172	X	06	BGYM214	H	08	MCHE315	H	16
SFPM171	X	06	SFPM172	X	06	MCHE215	H	08	MCHE316	H	16
AGLE111	X	12				MCHE216	H	08			
						PHYM215	X	08			
						PHYM216	X	08			
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFBM171	H	06	SFBM172	H	06	WVNS221	X	12	BCHS326	H	32
SFCM171	H	06	SFCM172	H	06	PHYM221	X	08	MCHE321	H	16
SFMM171	H	06	SFMM172	H	06	PHYM222	X	08	MCHE326	H	16
SFPM171	X	06	SFPM172	X	06	MCHE221	H	08			
			AGLE121	X	12	MCHE223	H	08			
						BGYM225	H	08			
						BGYM227	H	08			
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.8 Programme: Extended BSc in Environmental Sciences WITH Botany and Geography

CODE: 2XJ H06 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
MCBN171	X	12	MCBN172	X	12	MKBN211	X	16	GEOG311	H	32
GEOG171	H	12	GEOG172	H	12	PLKN213	H	16	PLKS313	H	32
PLKS171	H	12	PLKS172	H	12	GEOG211	H	16			
NCHE171	X	12	NCHE172	X	12	WVNS211	X	12			
ALDE111	X	12									
								60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
						PLKS221	H	16	GEOG321	H	32
						GEOG221	H	16	PLKN324	H	32
						MKBS221	X	16			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.8.1 **OLD PROGRAMME (PHASING OUT) MC:** Curriculum: Extended BSc
Biology - Geography

CODE: 200 205 - N301M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFBM171	H	06	SFBM172	H	06	WVNS211	X	12	BGYM315	H	16
SFGM171	H	06	SFGM172	H	06	BGYM215	H	08	BGYM316	H	16
SFMM171	X	06	SFMM172	X	06	BGYM216	H	08	GEOM316	H	16
SFIM171	X	06	SFIM172	X	06	GEOM214	H	08	GEOM317	H	16
AGLE111	X	12				GEOM215	H	08			
						CISM213	X	08			
						CISM214	X	08			
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFBM171	H	06	SFBM172	H	06	WVNS222	X	12	BCHS326	H	32
SFGM171	H	06	SFGM172	H	06	BGYM226	H	08	GEOM328	H	16
SFMM171	X	06	SFMM172	X	06	GEOM224	H	08	GEOM329	H	16
SFIM171	X	06	SFIM172	X	06	GEOM225	H	08			
			AGLE121	X	12	CISM225	X	08			
						CISM226	X	08			
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.9 Programme: Extended BSc WITH Chemistry and Computer Science

CODE: 2XF H31 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
CMPG171	H	12	CMPG172	H	12	NCHE211	H	8	CMPG311	H	16
MTHS171	X	12	MTHS172	X	12	NCHE212	H	8	CMPG313	H	16
NPHY171	X	12	NPHY172	X	12	MTHS211	X	8	NCHE311	H	16
NCHE171	H	12	NCHE172	H	12	MTHS212	X	8	NCHE312	H	16
ALDE111	X	12				CMGP211	H	8			
						CMGP212	H	8			
						WVNS211	X	12			
								60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				NCHE221	H	8	CMPG324	H	16
						NCHE222	H	8	CMPG325	H	16
						MTHS221	X	8	NCHE321	H	16
						MTHS222	X	8	NCHE322	H	16
						CMPG221	H	8			
						CMPG224	H	8			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.9.1 **OLD PROGRAMME (PHASING OUT) MC:** Curriculum: **Extended BSc Chemistry – Computer Science**

CODE: 200 197 - N302M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFCM171	H	06	SFCM172	H	06	WVNS211	X	12	MCHE315	H	16
SFIM171	H	06	SFIM172	H	06	MCHE215	H	08	MCHE316	H	16
SFMM171	X	06	SFMM172	X	06	MCHE216	H	08	CISM313	H	16
SFPM171	X	06	SFPM172	X	06	CISM213	H	08	CISM314	H	16
AGLE111	X	12				CISM214	H	08			
						MAYM217	X	16			
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFCM171	H	06	SFCM172	H	06	WVNS221	X	12	MCHE321	H	16
SFIM171	H	06	SFIM172	H	06	MCHE221	H	08	MCHE322	H	16
SFMM171	X	06	SFMM172	X	06	MCHE223	H	08	CISM326	H	16
SFPM171	X	06	SFPM172	X	06	CISM225	H	08	CISM327	H	16
			AGLE121	X	12	CISM226	H	08			
						MAYM227	X	16			
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.10 Programme: Extended BSc in Environmental Sciences WITH Chemistry and Geography

CODE: 2XJ H18 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
GEOG171	H	12	GEOG172	H	12	MTHS211	X	08	NCHE311	H	16
MTHS173	X	12	MTHS174	X	12	and MTHS212	X	08	NCHE312	H	16
NPHY171	X	12	NPHY172	X	12	OR NPHY211	X	08	GEOG311	H	32
NCHE171	H	12	NCHE172	H	12	and NPHY212	X	08			
ALDE111	X	12				GEOG211	H	16			
						NCHE211	H	08			
						NCHE212	H	08			
						WVNS211	X	12			
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester						Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				GEOG221	H	16	NCHE321	H	16
						NPHY221	X	08	NCHE322	H	16
						and NPHY222	X	08	GEOG321	H	32
						OR MTHS221	X	08			
						and MTHS222	X	08			
						NCHE221	H	08			
						NCHE222	H	08			
						WVNS222	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.10.1

**OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Chemistry – Geography**

CODE: 200 203 - N301M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFGM171	H	06	SFGM172	H	06	WVNS211	X	12	MCHE315	H	16
SFCM171	H	06	SFCM172	H	06	GEOM214	H	08	MCHE316	H	16
SFMM171	X	06	SFMM172	X	06	GEOM215	H	08	GEOM316	H	16
SFPM171	X	06	SFPM172	X	06	MCHE215	H	08	GEOM317	H	16
AGLE111	X	12				MCHE216	H	08			
						Electives: MAYM217 or PHYM215 PHYM216	X	16 or 08 08			
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFGM171	H	06	SFGM172	H	06	WVNS222	X	12	MCHE321	H	16
SCIM171	H	06	SFCM172	H	06	GEOM224	H	08	MCHE322	H	16
SFMM171	X	06	SFMM172	X	06	GEOM225	H	08	GEOM328	H	16
SFPM171	X	06	SFPM172	X	06	MCHE221	H	08	GEOM329	H	16
			AGLE121	X	12	MCHE223	H	08			
						Electives: MAYM227 or PHYM221 PHYM222	X	16 or 08 08			
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.11 Programme: Extended BSc WITH Chemistry and Mathematics

CODE: 2XF H11 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
CMPG171	X	12	CMPG172	X	12	NCHE211	H	08	NCHE311	H	16
MTHS171	H	12	MTHS172	H	12	NCHE212	H	08	NCHE312	H	16
NPHY171	X	12	NPHY172	X	12	MTHS211	H	08	MTHS311	H	16
NCHE171	H	12	NCHE172	H	12	MTHS212	H	08	MTHS312	H	16
ALDE111	X	12				NPHY211	X	08			
						NPHY212	X	08			
						WVNS211	X	12			
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				NCHE221	H	08	NCHE321	H	16
						NCHE222	H	08	NCHE322	H	16
						MTHS221	H	08	MTHS321	H	16
						MTHS222	H	08	MTHS322	H	16
						NPHY221	X	08			
						NPHY222	X	08			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

**NAS.1.25.11.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Chemistry – Mathematics**

CODE: 200 195 - N302M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFCM171	H	06	SFCM172	H	06	WVNS211	X	12	MCHE315	H	16
SFIM171	X	06	SFIM172	X	06	MCHE215	H	08	MCHE316	H	16
SFMM171	H	06	SFMM172	H	06	MCHE216	H	08	MAYM317	H	16
SFPM171	X	06	SFPM172	X	06	PHYM215	H	08	MAYM318	H	16
AGLE111	X	12				PHYM216	H	08			
						MAYM217	X	16			
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFCM171	H	06	SFCM172	H	06	WVNS221	X	12	MCHE321	H	16
SFIM171	X	06	SFIM172	X	06	MCHE221	H	08	MCHE322	H	16
SFMM171	H	06	SFMM172	H	06	MCHE223	H	08	MAYM327	H	16
SFPM171	X	06	SFPM172	X	06	PHYM221	H	08	MAMY328	H	16
			AGLE121	X	12	PHYM222	H	08			
						MAYM227	X	16			
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.12 Programme: Extended BSc WITH Chemistry and Physics

CODE: 2XF H05 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
CMPG171	H	12	CMPG172	H	12	MTHS211	H	08	NCHE311	H	16
MTHS171	X	12	MTHS172	X	12	MTHS212	H	08	NCHE312	H	16
NPHY171	H	12	NPHY172	H	12	NCHE211	H	08	NPHY311	H	16
NCHE171	X	12	NCHE172	X	12	NCHE212	H	08	NPHY312	H	16
ALDE111	X	12				NPHY211	X	08			
						NPHY212	X	08			
						WVNS211	X	12			
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				MTHS221	H	16	NCHE321	H	16
						MTHS222	H	08	NCHE322	H	16
						NCHE221	H	08	NPHY321	H	16
						NCHE222	X	08	NPHY322	H	16
						NPHY221	X	08			
						NPHY222	X	12			
						WVNS211	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

**NAS.1.25.12.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Chemistry – Physics**

CODE: 200 160 - N303M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFCM171	H	06	SFCM172	H	06	WVNS211	X	12	MCHE315	H	16
SFIM171	X	06	SFIM172	X	06	MCHE215	H	08	MCHE316	H	16
SFMM171	X	06	SFMM172	X	06	MCHE216	H	08	PHYM315	H	16
SFPM171	H	06	SFPM172	H	06	PHYM215	H	08	PHYM316	H	16
AGLE111	X	12				PHYM216	H	08	PHYM317	H	16
						MAYM217	X	16	PHYM318	H	16
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFCM171	H	06	SFCM172	H	06	WVNS221	X	12	MCHE321	H	16
SFIM171	X	06	SFIM172	X	06	MCHE221	H	08	MCHE322	H	16
SFMM171	X	06	SFMM172	X	06	MCHE223	H	08	PHYM321	H	16
SFPM171	H	06	SFPM172	H	06	PHYM221	H	08	PHYM322	H	16
			AGLE121	X	12	PHYM222	H	08	PHYM323	H	16
						MAYM227	X	16	PHYM324	H	16
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.13 Programme: Extended BSc WITH Computer Science and Electronics

CODE: 2XF H17 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st -3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	H	12	SFEM172	H	12	CMPG211	H	16	CMPG311	H	16
CMPG171	H	12	CMPG172	H	12	ELYM215	H	16	CMPG313	H	16
MTHS171	X	12	MTHS172	X	12	MTHS211	X	08	ELYM315	H	16
NPHY171	X	12	NPHY172	X	12	MTHS212	X	08	ELYM316	H	16
ALDE111	X	12				WVNS211	X	12			
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester						Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				CMPG221	H	8	CMPG324	H	16
						CMPG224	H	8	CMPG325	H	16
						ELYM227	H	16	ELYM325	H	16
						MTHS221	X	8	ELYM327	H	16
						WVNS221	X	12			
						MTHS222	X	8			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

**NAS.1.25.14 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Computer Science – Electronics**

CODE: 200 161 - N303M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	H	06	SFEM172	H	06	WVNS211	X	12	CISM313	H	16
SFIM171	X	06	SFIM172	X	06	CISM213	H	08	CISM314	H	16
SFMM171	X	06	SFMM172	X	06	CISM214	H	08	ELYM315	H	16
SFPM171	H	06	SFPM172	H	06	ELYM215	H	16	ELYM316	H	16
AGLE111	X	12				MAYM217	X	16			
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	H	06	SFEM172	H	06	WVNS221	X	12	CISM326	H	16
SFIM171	X	06	SFIM172	X	06	CISM225	H	08	CISM327	H	16
SFMM171	X	06	SFMM172	X	06	CISM226	H	08	ELYM327	H	16
SFPM171	H	06	SFPM172	H	06	ELYM227	H	16	ELYM328	H	16
			AGLE121	X	12	MAYM227	X	16			
Total 1st semester		24	Total 1st semester		36	Total 1st semester		60	Total 1st semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.15 Programme: Extended BSc in Environmental Sciences WITH Geography and Computer Science

CODE: 2XJ H14 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
GEOG171	H	12	GEOG172	H	12	CMPG211	H	16	CMPG311	H	16
CMPG171	H	12	CMPG172	H	12	GEOG211	H	16	CMPG313	H	16
MTHS173	X	12	MTHS174	X	12	PLKN213	X	16	GEOG311	H	32
PLKS171	X	12	PLKS172	X	12	WVNS211	X	12			
ALDE111	X	12									
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				CMPG221	H	08	CMPG321	H	16
						CMPG224	H	08	CMPG325	H	16
						GEOG221	H	16	GEOG321	H	32
						PLKS221	X	16			
						WVNS222	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

**NAS.1.25.15.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Computer Science – Geography**

CODE: 200 206 - N301M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFGM171	H	06	SFGM172	H	06	WVNS211	X	12	CISM313	H	16
SFIM171	H	06	SFIM172	X	06	CISM213	H	08	CISM314	H	16
SFMM171	X	06	SFMM172	X	06	CISM214	H	08	GEOM316	H	16
SFTM111	X	12				GEOM214	H	08	GEOM317	H	16
AGLE111	X	12				GEOM215	H	08			
						MAYM217	X	16			
Total 1st semester		42	Total 1st semester		18	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFGM171	H	06	SFGM172	H	06	WVNS221	X	12	CISM326	H	16
SFIM171	H	06	SFIM172	H	06	CISM225	H	08	CISM327	H	16
SFMM171	X	06	SFMM172	X	06	CISM226	H	08	GEOM328	H	16
SFTM121	X	12	AGLE121	X	12	GEOM224	H	08	GEOM328	H	16
						GEOM225	H	08			
						MAYM227	X	16			
Total 2nd semester		36	Total 2nd semester		24	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.16 Programme: Extended BSc WITH Computer Science and Mathematics
CODE: 2XF H09 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
APPM171	X	12	APPM172	X	12	APPM212	X	08	MTHS311	H	16
CMPG171	H	12	CMPG172	H	12	APPM213	X	08	MTHS312	H	16
MTHS171	H	12	MTHS172	H	12	CMPG211	H	16	CMPG311	H	08
NPHY171	X	12	NPHY172	X	12	MTHS211	H	08	CMPG313	H	08
ALDE111	X	12				MTHS212	H	08			
						WVNS211	X	12			
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				CMPG221	H	08	MTHS321	H	16
						CMPG224	H	08	MTHS322	H	16
						APPM222	X	08	CMPG321	H	08
						APPM223	X	08	CMPG325	H	08
						MTHS221	H	08			
						MTHS222	H	08			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

**NAS.1.25.16.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Computer Science – Mathematics**

CODE: 200 162 - N303M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFAM171	X	06	SFAM172	X	06	WVNS211	X	12	CISM313	H	16
SFIM171	H	06	SFIM172	H	06	CISM213	H	08	CISM314	H	16
SFMM171	H	06	SFMM172	H	06	CISM214	H	08	MAYM317	H	16
SFPM171	X	06	SFPM172	X	06	APMM217	X	16	MAYM318	H	16
AGLE111	X	12				MAYM217	X	16			
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFAM171	X	06	SFAM172	X	06	WVNS221	X	12	CISM326	H	16
SFIM171	H	06	SFIM172	H	06	CISM225	H	08	CISM327	H	16
SFMM171	H	06	SFMM172	H	06	CISM226	H	08	MAYM327	H	16
SFPM171	X	06	SFPM172	X	06	APMM227	X	16	MAYM328	H	16
			AGLE121	X	12	MAYM227	X	16			
Total 1st semester		24	Total 1st semester		36	Total 1st semester		60	Total 1st semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.17 Programme: Extended BSc WITH Physics and Computer Science

CODE: 2XF H25 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
NCHE171	X	12	NCHE172	X	12	CMPG211	H	16	CMPG311	H	16
CMPG171	H	12	CMPG172	H	12	MTHS211	X	08	CMPG313/5	H	16
MTHS171	X	12	MTHS172	X	12	MTHS212	X	08	NPHY311	H	16
NPHY171	H	12	NPHY172	H	12	NPHY211	H	08	NPHY312	H	16
ALDE111	X	12				NPHY212	H	08			
						WVNS211	X	12			
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				CMPG221	H	08	CMPG321	H	16
						CMPG222/4	H	08	CMPG325	H	16
						MTHS222	X	08	NPHY321	H	16
						MTHS224	X	08	NPHY322	H	16
						NPHY221	H	08			
						NPHY222	H	08			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

**NAS.1.25.17.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Computer Science – Physics**

CODE: 200 200 - N302M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFCM171	X	06	SFCM172	X	06	WVNS211	X	12	CISM313	H	16
SFIM171	H	06	SFIM172	H	06	CISM213	H	08	CISM314	H	16
SFMM171	X	06	SFMM172	X	06	CISM214	H	08	PHYM315	H	08
SFPM171	H	06	SFPM172	H	06	PHYM215	H	08	PHYM316	H	08
AGLE111	X	12				PHYM216	H	08	PHYM317	H	08
						MAYM217	X	16	PHYM318	H	08
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFCM171	X	06	SFCM172	X	06	WVNS221	X	12	CISM326	H	16
SFIM171	H	06	SFIM172	H	06	CISM225	H	08	CISM327	H	16
SFMM171	X	06	SFMM172	X	06	CISM226	H	08	PHYM321	H	08
SFPM171	H	06	SFPM172	H	06	PHYM221	H	08	PHYM322	H	08
			AGLE121	X	12	PHYM222	H	08	PHYM323	H	08
						MAYM227	X	16	PHYM324	H	08
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.18 Programme: Extended BSc WITH Electronics and Mathematics

CODE: 2XF H19 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	H	12	SFEM172	H	12	APPM212	X	08	ELYM315	H	16
CMPG171	X	12	CMPG172	X	12	APPM213	X	08	ELYM316	H	16
MTHS171	H	12	MTHS172	H	12	ELYM215	H	16	MTHS311	H	16
APPM171	X	12	APPM172	X	12	MTHS211	H	08	MTHS312	H	16
ALDE111	X	12				MTHS212	H	08			
						WVNS211	X	12			
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				APPM222	X	08	ELYM327	H	16
						APPM223	X	08	ELYM328	H	16
						ELYM227	H	16	MTHS321	H	16
						MTHS222	H	08	MTHS322	H	16
						MTHS221	H	08			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

**NAS.1.25.18.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Electronics – Mathematics**

CODE: 200 163 - N303M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	H	06	SFEM172	H	06	WVNS211	X	12	MAYM317	H	16
SFIM171	X	06	SFIM172	X	06	ELYM215	H	16	MAYM318	H	16
SFMM171	H	06	SFMM172	H	06	APMM217	X	16	ELYM315	H	16
SFAM171	X	06	SFAM172	X	06	MAYM217	H	16	ELYM316	H	16
AGLE111	X	12									
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	H	06	SFEM172	H	06	WVNS221	X	12	MAYM327	H	16
SFIM171	X	06	SFIM172	X	06	ELYM227	H	16	MAYM328	H	16
SFMM171	H	06	SFMM172	H	06	APMM227	X	16	ELYM327	H	16
SFAM171	X	06	SFAM172	X	06	MAYM227	H	16	ELYM328	H	16
			AGLE121	X	12						
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.19 Programme: Extended BSc WITH Electronics and Physics

CODE: 2XF H20 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	H	12	SFEM172	H	12	ELYM215	H	16	ELYM315	H	16
NPHY171	H	12	NPHY172	H	12	MTHS211	X	08	ELYM316	H	16
MTHS171	X	12	MTHS172	X	12	MTHS212	X	08	NPHY311	H	16
CMPG171	X	12	CMPG172	X	12	NPHY211	H	08	NPHY312	H	16
ALDE111	X	12				NPHY212	H	08			
						WVNS211	X	12			
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester						Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				ELYM227	H	16	ELYM327	H	16
						MTHS221	X	08	ELYM328	H	16
						MTHS222	X	08	NPHY321	H	16
						NPHY221	H	08	NPHY322	H	16
						NPHY222	H	08			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

**NAS.1.25.19.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Electronics – Physics**

CODE: 200 196 - N302M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	H	06	SFEM172	H	06	WVNS211	X	12	PHYM315	H	08
SFPM171	H	06	SFPM172	H	06	ELYM215	H	16	PHYM316	H	08
SFMM171	X	06	SFMM172	X	06	PHYM215	H	08	PHYM317	H	08
SFIM171	X	06	SFIM172	X	06	PHYM216	H	08	PHYM318	H	08
AGLE111	X	12				MAYM217	X	16	ELYM315	H	16
									ELYM316	H	16
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	H	06	SFEM172	H	06	WVNS221	X	12	PHYM321	H	08
SFPM171	H	06	SFPM172	H	06	ELYM227	H	16	PHYM322	H	08
SFMM171	X	06	SFMM172	X	06	PHYM221	H	08	PHYM323	H	08
SFIM171	X	06	SFIM172	X	06	PHYM222	H	08	PHYM324	H	08
			AGLE121	X	12	MAYM227	X	16	ELYM327	H	16
									ELYM328	H	16
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.20 Programme: Extended BSc WITH Physics and Mathematics

CODE: 2XF H23 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	X	12	SFEM172	X	12	ELYM215	X	16	MTHS311	H	16
NPHY171	H	12	NPHY172	H	12	MTHS211	H	08	MTHS312	H	16
MTHS171	H	12	MTHS172	H	12	MTHS212	H	08	NPHY311	H	16
CMPG171	X	12	CMPG172	X	12	NPHY211	H	08	NPHY312	H	16
ALDE111	X	12				NPHY212	H	08			
						WVNS211	X	12			
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester						Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				ELYM227	X	16	MTHS321	H	16
						MTHS221	H	08	MTHS322	H	16
						MTHS222	H	08	NPHY321	H	16
						NPHY221	H	08	NPHY322	H	16
						NPHY222	H	08			
						WVNS211	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

**NAS.1.25.20.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Mathematics – Physics**

CODE: 200 164 - N303M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	X	06	SFEM172	X	06	WVNS211	X	12	PHYM315	H	08
SFPM171	H	06	SFPM172	H	06	ELYM215	H	16	PHYM316	H	08
SFMM171	H	06	SFMM172	H	06	PHYM215	H	08	PHYM317	H	08
SFIM171	X	06	SFIM172	X	06	PHYM216	H	08	PHYM318	H	08
AGLE111	X	12				MAYM217	X	16	MAYM317	H	16
									MAYM318	H	16
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFEM171	X	06	SFEM172	X	06	WVNS221	X	12	PHYM321	H	08
SFPM171	H	06	SFPM172	H	06	ELYM227	H	16	PHYM322	H	08
SFMM171	H	06	SFMM172	H	06	PHYM221	H	08	PHYM323	H	08
SFIM171	X	06	SFIM172	X	06	PHYM222	H	08	PHYM324	H	08
			AGLE121	X	12	MAYM227	X	16	MAYM327	H	16
									MAYM328	H	16
Total 2nd semester		24	Total 1st semester		36	Total 2nd semester		60	Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.21 Programme: Extended BSc in Biological Sciences WITH Botany and Biochemistry

NAS.1.25.21.1 Programme Specific rules:

Take note: To continue to mainstream Biochemistry 3rd yr, you need an average of 65% for MCBN Foundation.

CODE: 2XK H01 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (2019 : 1st yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
PLKS171	H	12	PLKS172	H	12	PLKN213	H	16	PLKS313	H	32
MCBN171	H	12	MCBN172	H	12	BCHN213	H	16	BCHS316	H	16
MTHS173	X	12	MTHS174	X	12	NCHE211	X	08	BCHS317	H	16
NCHE171	X	12	NCHE172	X	12	NCHE212	X	08			
ALDE111	X	12				WVNS211	X	12			
		60	Total 1st semester		64	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				PLKS221	H	16	PLKS324	H	32
						BCHN222	H	16	BCHS321	H	16
						NCHE221	X	08	BCHS322	H	16
						NCHE222	X	08			
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.22 Programme: Extended BSc in Biological Sciences WITH Botany and Microbiology

CODE: 2XK H02 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (2019 : 1st yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
PLKS171	H	12	PLKS172	H	12	PLKN213	H	16	PLKS313	H	32
MCBN171 OR GEOG171	X	12	MCBN172 OR GEOG172	X	12	MKBN211	H	16	MKBS316	H	16
NCHE171	X	12	NCHE172	X	12	BCHN213 OR GEOG211	X	16	MKBS317	H	16
NPHY171	X	12	NPHY172	X	12	WVNS211	X	12			
ALDE111	X	12									
Total		60	Total		48	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				PLKS221	H	16	PLKN324	H	32
						MKBS221	H	16	MKBS326	H	16
						BCHN222 OR GEOG221	X	16	MKBS327	H	16
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.23 Programme: Extended BSc in Biological Sciences WITH Microbiology and Biochemistry

NAS.1.25.23.1 Programme Specific rules:

Take note: To continue to mainstream Biochemistry 3rd yr, you need an average of 65% for MCBN Foundation.

CODE: 2XK H11 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
MCBN171	H	12	MCBN172	H	12	BCHN213	H	16	BCHS316	H	16
NCHE171	H	12	NCHE172	H	12	NCHE211	X	08	BCHS317	H	16
MTHS173	X	12	MTHS174	X	12	NCHE212	X	08	MKBS316	H	16
NPHY171	X	12	NPHY172	X	12	MKBN211	H	16	MKBS317	H	16
ALDE111	X	12									
						WVNS211	X	12			
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester						Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				BCHN222	H	16	BCHS321	H	16
						NCHE221	X	08	BCHS322	H	16
						NCHE222	X	08	MKBS326	H	16
						MKBS221	H	16	MKBS327	H	16
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

**NAS.1.25.23.2 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Microbiology – Biochemistry**

Take note: To continue to mainstream Biochemistry 3rd yr, you need an average of 65% for MCBN Foundation.

CODE: 200 202 - N301M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFBM171	H	06	SFBM172	H	06	WVNS211	X	12	BCHS314	H	16
SFCM171	H	06	SFCM172	H	06	MKBS211	H	08	BCHS315	H	16
SFMM171	X	06	SFMM172	X	06	MKBS212	H	08	MKBS316	H	16
SFPM171	X	06	SFPM172	X	06	MCHE215	X	08	MKBS317	H	16
AGLE111	X	12				MCHE216	X	08			
						BCHS211	H	08			
						BCHS212	H	08			
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFBM171	H	06	SFBM172	H	06	WVNS221	X	12	BCHS324	H	16
SFCM171	H	06	SFCM172	H	06	MKBS222	H	08	BCHS325	H	16
SFMM171	X	06	SFMM172	X	06	MKBS223	H	08	MKBS326	H	16
SFPM171	X	06	SFPM172	X	06	MCHE221	X	08	MKBS327	H	16
			AGLE121	X	12	MCHE223	X	08			
						BCHS221	H	08			
						BCHS222	H	08			
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester			Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.24 Programme: Extended BSc in Environmental Sciences WITH Microbiology and Chemistry

CODE: 2XJ H10 - N301M

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

NEW PROGRAMME (1st - 3rd yrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
MCBN171	H	12	MCBN172	H	12	BCHN213	X	16	NCHE311	H	16
NCHE171	H	12	NCHE172	H	12	NCHE211	H	08	NCHE312	H	16
MTHS173	X	12	MTHS174	X	12	NCHE212	H	08	MKBS316	H	16
NPHY171	X	12	NPHY172	X	12	MKBN211	H	16	MKBS317	H	16
ALDE111	X	12				WVNS211	X	12			
						Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDE122	X	12				BCHN222	X	16	NCHE321	H	16
						NCHE221	H	08	NCHE322	H	16
						NCHE222	H	08	MKBS326	H	16
						MKBS221	H	16	MKBS327	H	16
						WVNS221	X	12			
						Total 2nd semester		60	Total 2nd semester		64
Total year level 1		72	Total year level 1		48	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

**NAS.1.25.24.1 OLD PROGRAMME (PHASING OUT) MC: Curriculum: Extended BSc
Microbiology – Chemistry**

CODE: 200 204 - N301M (4th yr students register on this programme)

CAMPUS: MAFIKENG (English)

DELIVERY MODE: FULL TIME

Compilation of programme:

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFBM171	H	06	SFBM172	H	06	WVNS211	X	12	MCHE315	H	16
SFCM171	H	06	SFCM172	H	06	MKBS211	H	08	MCHE316	H	16
SFMM171	X	06	SFMM172	X	06	MKBS212	H	08	MKBS316	H	16
SFPM171	X	06	SFPM172	X	06	MCHE215	H	08	MKBS317	H	16
AGLE111	X	12				MCHE216	H	08			
						BCHS211	X	08			
						BCHS212	X	08			
Total 1st semester		36	Total 1st semester		24	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
SFBM171	H	06	SFBM172	H	06	WVNS221	X	12	MCHE321	H	16
SFCM171	H	06	SFCM172	H	06	MKBS222	H	08	MCHE322	H	16
SFMM171	X	06	SFMM172	X	06	MKBS223	H	08	MKBS326	H	16
SFPM171	X	06	SFPM172	X	06	MCHE221	H	08	MKBS327	H	16
			AGLE121	X	12	MCHE223	H	08			
						BCHS221	X	08			
						BCHS222	X	08			
Total 2nd semester		24	Total 2nd semester		36	Total 2nd semester			Total 2nd semester		64
Total year level 1		60	Total year level 1		60	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											368

NAS.1.25.25 Programme: Extended BSc in Information Technology / Verlengde BSc in Inligtingstegnologie (VTC)

CODE/ KODE: 2XX H01 - N301V

CAMPUS/ KAMPUS: Vaal Triangle / Vaaldriehoek (English, see also /sien ook NAS1.7)

DELIVERY MODE / AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME / NUWE PROGRAM (1st & 2nd & 3rd yrs / 1^{ste} & 2^{de} & 3^{de} jrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
BMAN111	X	12	ACFS111	X	16	CMPG211	H	16	CMPG311	H	16
ITSP111	X	12	ITSP113	X	16	CMPG212	H	8	CMPG312	H	16
STTN111	X	12	ITSP114	X	16	CMPG213	H	16	CMPG313	H	16
WISS113	X	12	MTHS113	X	12	CMPG214	H	8	CMPG315	H	16
			CMPG111	H	12	CMPG215	H	8			
						WVNS211	X	12			
Total 1st semester		48	Total 1st semester		72	Total 1st semester		68	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDA/E121	X	12	ACFS121	X	16	CMPG221	H	8	CMPG321	H	16
ITSP121	X	12	BMAN223	X	16	CMPG222	H	8	CMPG322	H	16
STTN121	X	12	CMPG121	H	12	CMPG223	H	16	CMPG323	H	16
WISS123	X	12	CMPG122	H	12	MTHS225	X	8	CMPG324	H	16
						WVNS221	X	12			
Total 2nd semester		48	Total 2nd semester		56	Total 2nd semester		52	Total 2nd semester		64
Total year level 1		96	Total year level 1		128	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											472

NAS.1.25.25.1 OLD PROGRAMME (PHASING OUT) VTC: Curriculum: Extended BSc in Information Technology / Verlengde BSc in Inligtingstechnologie

CODE/ KODE : 264 102 - N302V 4th yr students register on this programme/ slegs 4^{de} jaars)

CAMPUS/ KAMPUS: Vaal Triangle / Vaaldriehoek (English see / sien NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
BMAN111	X	12	ACFS111	X	16	ITRW211	H	8	ITRW311	H	16
ITSP111	X	12	ITSP113	X	16	ITRW212	H	16	ITRW313	H	8
STTN111	X	12	ITSP114	X	16	ITRW213	H	16	ITRW315	H	8
WISS113	X	12	WISN113	X	12	ITRW214	H	16	ITRW316	H	16
						WVNS211	X	12	ITRW317	H	16
Total 1st semester		48	Total 1st semester		60	Total 1st semester		68	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
AGLA/E121	X	12	ACFS121	X	16	ITRW222	H	16	ITRW321	H	16
ITSP121	X	12	BMAN222	X	12	ITRW225	H	16	ITRW322	H	16
STTN121	X	12	ITRW123	H	12	WISN223	X	8	ITRW324	H	16
WISS123	X	12	ITRW124	H	12	WVNS221	X	12	ITRW325	H	16
Total 2nd semester		48	Total 2nd semester		52	Total 2nd semester		52	Total 2nd semester		64
Total year level 1		96	Total year level 1		112	Total year level 2		120	Total year level 3		128
Total credits for the curriculum											456

NAS.1.25.26 Programme: Extended BSc in Quantitative Risk Management / Verlengde BSc in Kwantitatiewe Risikobestuur (VTC)

CODE/ KODE: 2XT H01 - N301V

CAMPUS/ KAMPUS: Vaal Triangle / Vaaldriehoek (English see / sien NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME / NUWE PROGRAM (1st & 2nd & 3rd yrs / 1^{ste} & 2^{de} & 3^{de} jrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ACFS111	X	16	ACCF111	X	16	ECON211	H	16	BWIA313	H	24
CMPG111	X	12	BWIA111	H	12	MTHS211	X	8	EKRP311	H	16
ECON112	X	12	EKRP211	H	16	MTHS212	X	8	STTN316	H	24
STTF115	X	12	MTHS111	X	12	STTN215	H	16	STTN317	H	8
WISS111	X	12	STTF215	X	16	WVES311	X	12			
Total 1st semester		64	Total 1st semester		72	Total 1st semester		60	Total 1st semester		72
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDA/E122	X	12	ACCF121	X	16	APPM222	X	8	BWIN321	H	16
ACFS121	X	16	BWIA121	H	12	MTHS222	X	8	EKRP321	H	16
CMPG122	X	12	EKRP221	H	16	STTN225	H	16	STTN326	H	16
ECON122	X	12	MTHS121	X	12				STTN327	H	16
STTF125	X	12	STTF225	X	16						
WISS121	X	12	WVES221	X	12						
Total 2nd semester		76	Total 2nd semester		84	Total 2nd semester		32	Total 2nd semester		64
Year Modules											
						BWIA273	H	16			
						FINM271		18			
Total year level 1		140	Total year level 1		156	Total year level 2		126	Total year level 3		136
Total credits for the curriculum											558

NAS.1.25.26.1 OLD PROGRAMME (PHASING OUT) VTC

Curriculum: Extended BSc in Quantitative Risk Management / Verlengde BSc in Kwantitatiewe Risikobestuur

CODE/ KODE: 200 207 - N301V (4th yr students register on this programme / slegs 4^{de} jaars)

CAMPUS/ KAMPUS: Vaal Triangle / Vaaldriehoek (English see / sien NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ACFS111	X	16	ACCF111	X	16	ECON211	H	16	BWIA313	H	24
ECON111	H	12	BWIA111	H	12	STTN215	H	16	EKRP311	H	16
ITRW112	X	12	EKRP211	H	16	WISN211	X	8	STTN316	H	24
STTF115	X	12	STTF215	X	16	WISN212	X	8	STTN317	H	8
WISS111	X	12	WISN111	X	12	WVES311	X	12			
Total 1st semester		64	Total 1st semester		72	Total 1st semester		60	Total 1st semester		72
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ACFS121	X	16	ACCF121	X	16	STTN225	H	16	BWIN321	H	16
AGLA/E121	X	12	BWIA121	H	12	TGWN223	X	8	EKRP321	H	16
ECON121	H	12	EKRP221	H	16	WISN226	X	8	STTN326	H	16
ITRW123	X	12	STTF225	X	16	FINM221	X	16	STTN327	H	16
WISS121	X	12	WISN121	X	12						
STTF125	X	12	WVES221	X	12						
Total 2nd semester		76	Total 2nd semester		84	Total 2nd semester		48	Total 2nd semester		64
Year module											
						BWIA271	H	32			
Total year level 1		140	Total year level 1		156	Total year level 2		140	Total year level 3		136
Total credits for the curriculum											572

**NAS.1.25.27 Programme: Extended BSc in Business Analytics WITH Data Mining /
Verlengde BSc in Bedryfsanalise MET Data-ontginning (VTC)**

CODE/ KODE: 2XR H01 - N301V

CAMPUS/ KAMPUS: Vaal Triangle / Vaaldriehoek (English see / sien NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDYS

Compilation of programme / Samestelling van program:

NEW PROGRAMME / NUWE PROGRAM (1st & 2nd & 3rd yrs / 1^{ste} & 2^{de} & 3^{de} jrs)

Year Level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ACFS111	X	16	BWIA111	H	12	MTHS211	H	8	CMPG311	H	16
CMPG111	X	12	CMPG211	H	16	MTHS212	H	8	CMPG312	H	16
ECON112	X	12	CMPG213	H	16	STTN215	H	16	CMPG313	H	16
STTF115	X	12	MTHS111	X	12	WVES311	X	12	STTN316	H	24
WISS111	X	12	STTF215	X	16				STTN317	H	8
Total 1st semester		64	Total 1st semester		72	Total 1st semester		44	Total 1st semester		80
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDA/E122	X	12	BWIA121	H	12	APPM222	X	8	CMPG321	H	16
ACFS121	X	16	CMPG223	H	16	CMPG221	H	8	CMPG322	H	16
CMPG121	H	12	ECON122	X	16	MTHS222	X	8	STTN326	H	16
CMPG122	H	12	MTHS121	X	12	STTN225	H	16	STTN327	H	16
STTF125	X	12	STTF225	X	16	WVES221	X	12			
WISS121	X	12									
Total 2nd semester		76	Total 2nd semester		72	Total 2nd semester		60	Total 2nd semester		64
Year Modules											
						BWIA273	H	16			
Total year level 1		140	Total year level 1		144	Total year level 2		120	Total year level 3		144
Total credits for the curriculum											548

NAS.1.25.27.1 OLD PROGRAMME (PHASING OUT) VTC: Curriculum: Extended BSc in Data Mining / Verlengde BSc in Data-ontginning

CODE/ KODE : 200 198 - N302V (4th yr students register on this programme / Slegs 4^{de} jaars)

CAMPUS/ KAMPUS: Vaal Triangle/ Vaaldriehoek (English see / sien NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ACFS111	X	16	BWIA111	H	12	ITRW214	H	16	ITRW311	H	16
ECON111	H	12	ITRW212	H	16	STTN215	H	16	ITRW317	H	16
ITRW112	X	12	ITRW213	H	16	WISN211	X	8	STTN316	H	24
STTF115	X	12	SSTTF215	X	16	WISN212	X	8	STTN317	H	8
WISS111	X	12	WISN111	X	12	WVES311	X	12			
Total 1st semester		64	Total 1st semester		72	Total 1st semester		60	Total 1st semester		64
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ACFS121	X	16	BWIA121	H	12	ITRW325	H	16	ITRW321	H	16
AGLA/E121	X	12	ECON121	X	12	STTN225	H	16	STTN326	H	16
ITRW123	H	12	ITRW222	H	16	TGWN223	X	8	STTN327	H	16
ITRW124	H	12	STTF225	X	16	WISN226	X	8			
STTF125	X	12	WISN121	X	12	WVES221	X	12			
WISS121	X	12									
Total 2nd semester		76	Total 2nd semester		68	Total 2nd semester		60	Total 2nd semester		48
Total year level 1		140	Total year level 1		140	Total year level 2		120	Total year level 3		112
Total credits for the curriculum										512	

NAS.1.25.28 Programme: Extended BSc in Financial Mathematics / Verlengde BSc in Finansiële Wiskunde (VTC)

CODE/ KODE: 2XS H01- N301V

CAMPUS/ KAMPUS: Vaal Triangle / Vaaldriehoek (English see / sien NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

NEW PROGRAMME / NUWE PROGRAM (1st & 2nd & 3rd yrs / 1^{ste} & 2^{de} & 3^{de} jrs)

Year level 1			Year level 2			Year level 3			Year level 4		
Year modules			Year modules			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ACFS111	X	16	BWIA111	H	12	MTHS211	H	8	BWIA313	H	24
CMPG111	X	12	ECON211	X	16	MTHS212	H	8	MTHS311	H	16
ECON112	X	12	EKRP211	H	16	STTN215	H	16	STTN316	H	24
STTF115	X	12	MTHS111	X	12	WVES311	X	12	STTN317	H	8
WISS111	X	12	STTF215	X	16						
Total 1st semester		64	Total 1st semester		72	Total 1st semester		44	Total 1st semester		72
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
			Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ALDA/E122	X	12	BWIA121	H	12	APPM222	X	8	BWIN321	H	16
ACFS121	X	16	EKRP221	X	16	MTHS221	X	8	EKRP321	H	16
CMPG122	X	12	MTHS121	H	12	MTHS222	H	8	STTN326	H	16
ECON122	X	12	STTF225	X	16	STTN225	H	16	STTN327	H	16
STTF125	X	12	WVES221	X	12						
WISS121	X	12									
Total 2nd semester		76	Total 2nd semester		68	Total 2nd semester		40	Total 2nd semester		64
Year Modules											
						BWIA273	H	16			
Total year level 1		140	Total year level 1		140	Total year level 2		100	Total year level 3		136
Total credits for the curriculum											516

NAS.1.25.28.1 OLD PROGRAMME (PHASING OUT) VTC: Curriculum: Extended BSc in Financial Mathematics / Verlengde BSc in Finansiële Wiskunde (VTC)

CODE/ KODE : 200 208 - N301V (4th yr students register on this programme / slegs 4^{de} jaars)

CAMPUS/ KAMPUS: Vaal Triangle / Vaaldriehoek (English, see / sien NAS1.7)

DELIVERY MODE/ AFLEWERINGSMETODE: FULL TIME / VOLTYDS

Compilation of programme / Samestelling van program:

Year Level 1			Year level 2			Year level 3			Year level 4		
First semester			First semester			First semester			First semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ACFS111	X	16	BWIA111	H	12	STTN215	H	16	BWIA313	H	24
ECON111	H	12	ECON211	X	16	WISN211	X	8	STTN316	H	24
ITRW112	X	12	EKRP211	H	16	WISN212	X	8	STTN317	H	8
STTF115	X	12	STTF215	X	16	WVES311	X	12	WISN314	H	16
WISS111	X	12	WISN111	X	12						
Total 1st semester		64	Total 1st semester		72	Total 1st semester		44	Total 1st semester		72
Year Level 1			Year level 2			Year level 3			Year level 4		
Second semester			Second semester			Second semester			Second semester		
Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr	Module code	Core	Cr
ACFS121	X	16	BWIA121	H	12	STTN225	H	16	BWIN321	H	16
AGLA/E121	X	12	EKRP221	X	16	TGWN223	X	8	STTN326	H	16
ECON121	H	12	STTF225	X	16	WISN226	H	8	STTN327	H	16
ITRW123	X	12	WISN121	H	12	WISN224	H	8	EKRP321	H	16
STTF125	X	12	WVES221	X	12						
WISS121	X	12									
Total 2nd semester		76	Total 2nd semester		68	Total 2nd semester		40	Total 2nd semester		64
Year module											
						BWIA271	H	32			
Total year level 1		140	Total year level 1		140	Total year level 2		116	Total year level 3		136
Total credits for the curriculum											532

NAS.2 MODULE OUTCOMES / MODULE UITKOMSTE

NAS.2.1 DIPLOMA IN ANIMAL HEALTH

Module code: AHVM111	SEMESTER 1	NQF Level: 5
Title: Anatomy and Physiology: Animal health 1		
Module outcomes: Students should be able to- Describe the basic organization of living organisms with respect to the cell, tissues and organ systems Describe the basic anatomy and physiology of domestic animals including birds with respect to the integumentary, musculo-skeletal, nervous and endocrine systems.		
Method of delivery: Lectures (power point), videos		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
Module code: AHVM122	SEMESTER 2	NQF Level: 5
Title: Anatomy and Physiology: Animal Health II		
Module outcomes: Students should be able to describe, differentiate the anatomy and physiology of domestic animals including birds with respect to the respiratory, circulatory, gastrointestinal, urinary, and reproductive systems. In practical sessions be able to identify and differentiate normal tissues and anatomical organs in domestic animals.		
Method of delivery: Lectures (power point), videos, practical and dissection		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
Module code: AHVM112	SEMESTER 1	NQF Level: 5
Title: Animal welfare, Handling and Equipment I		
Module outcomes: Students should be able to perform basic animal handling techniques and farm procedures. Name and describe the commonly used veterinary instruments and equipment. In practical sessions students practice under the supervision of veterinarians and animal health technicians, procedures related to the theory topics above. Video tapes may be used to supplement the students practical learning.		
Method of delivery: Lectures (power point), videos and farm visits		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
Module code: AHVM123	SEMESTER 2	NQF Level: 5
Title: Animal welfare, Handling and Equipment II		
Module outcomes: Students should be able to increase their proficiency and perform additional basic animal handling techniques and routine farm procedures and revise previous skills. Name and describe additional commonly used veterinary instruments and equipment. In practical sessions students will practice and increase their proficiency under the supervision of veterinarians and animal health technicians, procedures related to the theory topics above. Video tapes may be be used to supplement the students practical learning.		
Method of delivery: Lectures (power point), videos and practical visit on farms		
Assessment modes: Assignments, Quizzes, Tests, Examinations		

Module code: AHVM121	SEMESTER 2	NQF Level: 5
Title: Basic Veterinary Microbiology for Animal Health		
Module outcomes:		
<p>Students should be able to give a basic description of the classes of microorganisms of veterinary importance (bacteria, viruses, fungi, rickettsia and protozoans etc). Give a general grouping of bacteria and fungi of veterinary importance according to staining results, morphology and characteristics. Give a basic description of the general principles of pathogenesis by microbiological agents. Describe the commonly encountered animal health infections: causative agents, transmission, prevention of transmission, human health implications. In practical sessions learners will participate in the use of general laboratory procedures in microbiology including but not limited to staining and viewing of bacteria under the microscope, culturing of bacteria, use of different media, sensitivity testing, etc. especially as related to animal diseases. Case studies may also be used. Use of practical microbiological procedures to help differentiate common microbiological pathogens.</p>		
Method of delivery: Lectures (point), videos and practical on live carcasses and use of models		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
Module code: AHVM122	SEMESTER 2	NQF Level: 5
Title: Anatomy and Physiology : Animal Health 11		
Module outcomes:		
(Not received)		
Module code: AHVM226	SEMESTER 2	NQF Level: 5
Title: Basic veterinary Microbiology for Animal Science		
Module outcomes:		
<p>Students should be able to give a functional description of the classes of microorganisms of animal health importance (bacteria, viruses, fungi, rickettsia and protozoans etc). Give a functional description of the general principles of pathogenesis by microbiological agents. Give a general grouping of bacteria and fungi of animal health importance according to staining results, morphology and characteristics. Describe microbes causing important diseases of animals. Describe the commonly encountered animal health infections: causative agents, transmission, prevention of transmission, human health implications. In practical sessions learners will participate in the use of general laboratory procedures in microbiology including but not limited to staining and viewing of bacteria under the microscope, culturing of bacteria, use of different media, sensitivity testing, etc. especially as related to animal diseases. Case studies may also be used. Use of practical microbiological procedures to help differentiate common microbiological pathogens.</p>		
Method of delivery: Lectures (power point), videos and farm visits		
Assessment modes: summative: Assignments, Quizzes, Tests, written and practical Examinations		
Module code:AHVM211	SEMESTER 1	NQF Level: 5
Title: Diseases I		
Module outcomes:		
<p>Students should be able to describe the basic concepts of the commonly occurring viral and bacterial diseases in respect to epidemiology, clinical signs, postmortem, diagnostic methods, treatment, and preventative measures with emphasis on the notifiable diseases. Evaluate lists of differential diagnoses and come up with tentative diagnosis In practical sessions students will be involved in assisting the veterinarian in the examination, diagnosis and treatment as well as prevention of the diseases.</p>		

<p>When specific disease conditions are not seen in the live animals, videos will be used to supplement the student practical learning. Students will be guided in the use of epidemiological surveys and investigations including the collection and recording of data related to the diseases studied.</p>		
<p>Method of delivery: Lectures (power point), videos and farm visits</p>		
<p>Assessment modes: Assignments, Quizzes, Tests, Examinations</p>		
Module code: AHVM221	SEMESTER 2	NQF Level: 5
<p>Title: Diseases II</p>		
<p>Module outcomes: Module outcomes: Students should be able to describe the basic concepts of the commonly occurring viral and bacterial diseases in respect to epidemiology, clinical signs, post-mortem, diagnostic methods, treatment, and preventative measures with emphasis on the notifiable diseases. They should be able to evaluate lists of differential diagnoses and come up with tentative diagnosis. In practical sessions students will be involved in assisting the veterinarian in the examination, diagnosis and treatment as well as prevention of the diseases. When specific disease conditions are not seen in the live animals, videos (youtube) will be used to supplement the student practical learning. Students will be guided in the use of epidemiological surveys and investigations including the collection and recording of data related to the diseases studied.</p>		
<p>Method of delivery: Lectures (power point), videos and farm visits</p>		
<p>Assessment modes: Assignments, Quizzes, Tests, Examinations</p>		
Module code: AHVM212	SEMESTER 1	NQF Level: 5
<p>Title: Parasitology for Animal Health</p>		
<p>Module outcomes: Students should be able to describe the basic aspects of the commonly encountered internal and external parasites. Describe the basic classes of the commonly encountered helminths (nematodes, trematodes, cestodes) Describe the basic classes of the commonly encountered ticks, mites, insects and lice of veterinary importance Treatment and control for external parasites. Treatment and control of helminths using both oral and injectable medication Practicals: Identification of helminths, and/ or eggs from faecal samples, Identification of external parasites; including ticks, tick counts, mites, insects and lice dipping for external parasite</p>		
<p>Method of delivery: Lectures (power point), videos and laboratory practicals</p>		
<p>Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations</p>		
NEW Module code: AHVM222	SEMESTER 2	NQF Level: 5
<p>Title: Obstetrics and Genital Diseases: Animal Health</p>		
<p>Module outcomes: Students should be able to describe the basic concepts of the reproductive cycles of domestic animals, and the factors which influence them. Describe the diseases and conditions causing infertility in production and companion animals and know how to prevent them. Describe the basic physiology of gestation and parturition, and its related problems. Understand the basic principles of pregnancy diagnosis In practical: learners assist the veterinarian with clinical cases involving obstetrical procedures for relieving dystocia, treatments associated with dystocia, assisting with dystocia, retained placentas, fertility examinations, semen evaluations, sheath washes, and other clinical cases related to obstetrics and reproductive diseases.</p>		
<p>Method of delivery: Lectures (power point), videos and practical</p>		

Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
Module code: AHVM223	SEMESTER 16	NQF Level: 5
Title: Pharmacology and Toxicology: Animal Health		
Module outcomes:		
<p>Students should be able to explain the basic pharmacokinetic and toxicokinetic concepts of medicines, toxic plants and common poisons.</p> <p>Explain the basic modes of action of the toxins, and relate them to the respective clinical signs.</p> <p>Explain the basic diagnostic methods and treatments in cases of poisoning.</p> <p>Assist the veterinarian in the treatment of sick animals using the various medications, as well as in the treatment of common intoxications.</p> <p>In practical sessions learners use different routes of administration of medication including subcutaneous, intramuscular, intravenous, intraperitoneal, epidural, intramammary, subconjunctival, topical and oral.</p> <p>Restraint and the assistance of the veterinarian in drug administration.</p> <p>Identification of common toxic plants, poisons, heavy metals, organophosphates, rodenticides and others.</p>		
Method of delivery: Lectures (power point),practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHVM224	SEMESTER 8	NQF Level: 5
Title: Public Health for Animal Health I		
Module outcomes:		
<p>Students should be able to describe the general measures that ensure that water and food of animal origin is free from pathogens and toxins.</p> <p>Advise farmers on concepts of safe and hygienic food production.</p> <p>Demonstrate functional knowledge of the relevant national and international legislation regarding the management of food-borne and zoonotic diseases.</p> <p>Describe the gross anatomy of a slaughter carcass.</p> <p>Describe the abattoir slaughter procedures.</p> <p>Describe the abattoir hygiene processes.</p> <p>Describe the basic procedure of meat inspection in an abattoir.</p> <p>Describe the statutory requirements and obligations of animals health technicians in terms of the relevant acts.</p> <p>Describe the general life cycles, epidemiology, treatment and control measures of the common zoonoses, as learnt from Diseases modules, including but not limited to rabies, anthrax, brucellosis, Rift Valley fever, tapeworms and hookworms.</p> <p>In practical sessions students visits all categories and grades of abattoirs in and around the province. Visits to dairies, dairy processing plants. Integration with public health officials, meat and dairy inspectors and others involved in regulatory public health services.</p>		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHVM225	SEMESTER 8	NQF Level: 5
Title: Clinical Laboratory Techniques		
Module outcomes:		
<p>Module outcomes: Students should be able to explain the basic laboratory techniques.</p> <p>Demonstrate the basic theoretical and practical laboratory diagnostic skills.</p> <p>In practical sessions students do blood smear preparation and evaluation, faecal flotationpreparation and evaluation, haematocrit preparation and evaluation. Urine samples evaluation, sediment staining and evaluation, bacteria cultures and sensitivity testing, media preparation, specimen preservation and storage. Milk testing, somatic cell counts, rumen fluid evaluation, skin scrapings for all species, clinical chemistry.</p>		

<p>Students will practice in the lab the procedures studied in the theory of the various courses. Practice of collection, preservation and preparation of samples for dispatch to the various kinds of laboratories. The ideal situation for doing these procedures will be practised by outsourcing staff from government laboratories and the use of demonstration videos. Demonstrate the knowledge and application of basic laboratory practices on samples brought to the laboratory and also by way of assignments.</p>		
<p>Method of delivery: Lectures (power point), Practicals, videos and visits to other laboratories.</p>		
<p>Assessment modes: Assignments, Practicals, Quizzes, Tests, written and practical Examinations</p>		
MODULE CODE: AHVM214	SEMESTER 8	NQF Level: 5
<p>Title: Pathology I</p>		
<p>Module outcomes: Students should be able to explain the common concepts of general pathology. Students should be able to perform post mortem procedures and write the report using correct terminology. Be able to collect and dispatch specimens, in addition to proper disposal and disinfection of carcasses and pollution sites respectively. Understand the general pathology of the cells, blood circulation, inflammation and causes of diseases</p>		
<p>Method of delivery: Lectures (power point), videos and practicals</p>		
<p>Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations</p>		
MODULE CODE: AHVM228	SEMESTER 8	NQF Level: 5
<p>Title: Pathology II</p>		
<p>Module outcomes: Should be able to conduct post-mortems and write reports using correct terminology Be able to collect and dispatch specimens for laboratory diagnosis Able to describe the systemic pathology of the skin, muscular skeletal system, CVS, RS, GIT, haemopoietic, urinary, reproductive, nervous and endocrine systems.</p>		
<p>Method of delivery: Lectures (power point), videos and practicals</p>		
<p>Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations</p>		
MODULE CODE: AHVM316	SEMESTER 16	NQF Level: 5
<p>Title: Companion Animal Clinical Care for AHT 1</p>		
<p>Module outcomes Students should be able to perform first aid procedures on companion animals prior to attendance by a veterinarian. Perform primary health care procedures on companion animals. Communicate preventative methods to clients. Ability to assist veterinarians in surgery, diagnostics, and treatments.</p>		
<p>In practical sessions be able to conduct procedures such as: clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of debilitated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Be able to execute procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.</p>		
<p>Method of delivery: Lectures (power point), videos and practicals</p>		
<p>Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations</p>		

MODULE CODE: AHVM326	SEMESTER 12	NQF Level: 5
Title: Companion Animal Clinical Care for AHT II		
Module outcomes:		
<p>Students should be able to perform further first aid procedures on companion animals prior to attendance by a veterinarian.</p> <p>Perform further primary health care procedures on companion animals. Communicate preventative methods to clients.</p> <p>Assist veterinarians in surgery, diagnostics, and treatments.</p> <p>Be able to execute procedures done during practical sessions such as: clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of debilitated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination.</p> <p>Be able to execute procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.</p>		
Method of delivery: Lectures (power point), videos and practicals arm visits		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
MODULE CODE: AHVM317	SEMESTER 16	NQF Level: 5
Title: Production Animal Clinical Care for AHT I		
Module outcomes:		
<p>Students should be able to perform first aid procedures on production animal prior to attendance by a veterinarian.</p> <p>Perform primary health care procedures on production animals. Communicate preventative methods to clients.</p> <p>Assist veterinarians in surgery, diagnostics, and treatments.</p> <p>Be able to conduct procedures such as: clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of debilitated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination.</p> <p>Be able to execute procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.</p>		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
MODULE CODE: AHVM322; AHVM327	SEMESTER 2	NQF Level: 5
Title: Production Animal Clinical Care for AHT II		
Module outcomes:		
<p>Students should be able to perform further fundamental first aid procedures on production animals prior to attendance by a veterinarian. Perform further primary health care procedures on production animals. Communicate fundamental preventative methods to clients. Assist veterinarians in surgery, diagnostics, and treatments. In practical session be able to conduct procedures such as: clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of debilitated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination.</p>		

Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.		
Method of delivery: Lectures (power point), videos and practicals on farms		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
MODULE CODE: AHVM318	SEMESTER 8	NQF Level: 5
Title: Epidemiology (not received)		
MODULE CODE: AHVM319	SEMESTER 12	NQF Level: 5
Title: Practical Experiential Learning I		
Module outcomes: In addition to the experience acquired during clinics and outreach sessions, students should be able to relate what they learnt during the entire curriculum with the actual field situations under supervision of professionals in various fields of animal health and production. Modalities; students would have spent at least 2 weeks in the field (outside the University) in an approved laboratory, registered veterinary clinic, state veterinary office, wildlife park, breeding stations, poultry houses, auctions and other such stations under the supervision of qualified veterinarians, game rangers or game veterinarian. Students would have worked at the University farm under the supervision of the farm sectional managers, the farm manager and animal health staff members at prescribed times.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHVM324	SEMESTER 8	NQF Level: 5
Title: Scheduled Diseases		
Modules outcomes: Students should be able to describe and perform procedures relating to controlled diseases such as: Tuberculosis (TB) and Contagious Abortion (CA), FMD, eradication schemes as prescribed by the National Department of Agriculture. Describe the general concepts of Scheduled Diseases and current disease outbreaks. In practical sessions, Prescribed field tests, sampling procedures using relevant materials and equipment and interpretation of results. Video shows of current disease outbreaks may be used.		
Method of delivery: Lectures (power point), group discussions and individual assignments		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHDM317	SEMESTER 8	NQF Level: 5
Title: Veterinary Jurisprudence		
At completion of this module students should be able to: demonstrate knowledge and understanding of important legislation governing the veterinary and para-veterinary laws in the world and in South Africa; demonstrate knowledge of the application of legislation in the control of diseases and the role of animal health technicians; demonstrate the ability to formulate and write legal documents; understand the concept of animal welfare and animal welfare assessment of both farm animals and companion animals; and understand procedures and legislation and solve problems when dealing with trading, animal protection and insurance.		
Method of delivery: Lectures (power point)		
Assessment modes: Assignments, Quizzes, Tests, Examinations		

MODULE CODE: AHDM316	SEMESTER 8	NQF Level: 5
Title: Meat Inspection I		
Module outcomes:		
At completion of this module students should be able to: demonstrate knowledge and understanding of important legislation governing the veterinary and para-veterinary laws in the world and in South Africa; demonstrate knowledge of the application of legislation in the control of diseases and the role of animal health technicians; demonstrate the ability to formulate and write legal documents; understand the concept of animal welfare and animal welfare assessment of both farm animals and companion animals; and understand procedures and legislation and solve problems when dealing with trading, animal protection and insurance.		
Method of delivery: Lectures (power point), videos and abattoir training		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
MODULE CODE: AHDM326	SEMESTER 8	NQF Level: 5
Title: Meat Inspection II		
Module outcomes:		
Student should be able to theoretically and practically:		
<ul style="list-style-type: none"> • Demonstrate extensive knowledge of meat inspection and abattoir hygiene • Demonstrate understanding of the microbiological contamination and sample and specimen collection in abattoirs • Perform ante mortem and post mortem inspections • Implement hygiene management systems with the objective of improving meat safety in abattoirs • Apply the relevant national and international legislation with regards all aspects of abattoir 		
Method of delivery: Lectures (power point), videos and visit at abattoirs		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		

NAS.2.2 BSC AGRIC - ANIMAL HEALTH

MODULE CODE: AHPM213	SEMESTER 2	NQF Level: 6
Title: Microbiology for Animal Health		
Module outcomes:		
Students should be able to describe the classes of microorganisms of veterinary importance (bacteria, viruses, fungi, rickettsia and protozoans etc). Group bacteria and fungi of veterinary importance according to staining results, morphology and characteristics Describe the general principles of pathogenesis by microbiological agents. Describe the commonly encountered animal health infections: causative agents, transmission, prevention of transmission, human health implications. In practical sessions Learners will participate in the use of general laboratory procedures in microbiology including but not limited to staining and viewing of bacteria under the microscope, culturing of bacteria, use of different media, sensitivity testing, etc. especially as related to animal diseases. Case studies may also be used. Use of practical microbiological procedures to help differentiate common microbiological pathogens. Ability to apply the above acquired knowledge to conduct research		
Method of delivery: Lectures (power point), videos and practicals in laboratory		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		

MODULE CODE: AHPM215	SEMESTER 2	NQF Level: 6
Title: Anatomy and Physiology: Animal Health I		
Module outcomes: Students should be able to describe the organization of living organisms with respect to the cell, tissues, and organ systems. Describe the anatomy and physiology of domestic animals including birds, with respect to the integumentary, musculo-skeletal, nervous, and endocrine systems. Practical; Demonstrations by lecturer and dissections by students of systems, organs and tissues studied in the theory.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
MODULE CODE: AHPM224	SEMESTER 2	NQF Level: 6
Title: Anatomy and Physiology: Animal Health II		
Module outcomes: Students should be able to describe the anatomy and physiology of domestic animals including birds, with respect to the respiratory, circulatory, gastrointestinal, urinary, and reproductive systems. Practical; Demonstrations by lecturer and dissections by students of systems, organs and tissues studied in the theory.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
MODULE CODE: AHPM216	SEMESTER 2	NQF Level: 6
Title: Animal welfare, Handling and Equipment I		
Module outcomes: Students should be able to perform animal handling techniques and selected basic farm procedures. Name and describe commonly used veterinary instruments and equipment. Practical will involve students practising, under the supervision of veterinarians and animal health technicians, procedures related to the theory topics above. Video tapes may be used to supplement the students practical learning.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
MODULE CODE: AHPM223	SEMESTER 2	NQF Level: 6
Title: Animal welfare, Handling and Equipment II		
Module outcomes: Students should be able to increase their proficiency, and perform additional animal handling techniques and routine farm procedures. Name and describe additional commonly used veterinary instruments and equipment. The following topics are covered, Castration, dehorning, hoof trimming, relieving choke, trocar and cannula use, feet examination, stomach tubing, aging using teeth, rectal palpation. Names, description, and use of common veterinary instruments. Practical will involve students practising and increasing their proficiency, under the supervision of veterinarians and animal health technicians, procedures related to the theory topics above. Video tapes may be used to supplement the students practical learning.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		

MODULE CODE: AHPM311	SEMESTER 1	NQF Level: 7
Title: Diseases I		
Module outcomes:		
<p>Module outcomes: Students should be able to describe the basic concepts of the commonly occurring viral and bacterial diseases in respect to epidemiology, clinical signs, post-mortem, diagnostic methods, treatment, and preventative measures with emphasis on the notifiable diseases.</p> <p>They should be able to evaluate lists of differential diagnoses and come up with tentative diagnosis.</p> <p>In practical sessions students will be involved in assisting the veterinarian in the examination, diagnosis and treatment as well as prevention of the diseases.</p> <p>When specific disease conditions are not seen in the live animals, videos (youtube) will be used to supplement the student practical learning.</p> <p>Students will be guided in the use of epidemiological surveys and investigations including the collection and recording of data related to the diseases studied. An assignment that uses diseases taught to do an investigative project will also be given and students are expected to follow up a project outline for it.</p>		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHPM321	SEMESTER 16	NQF Level: 5
Title: Diseases II		
Module outcomes:		
<p>Students should be able to describe the fundamental concepts of the common protozoal, rickettsial, fungal and non-infectious conditions regarding epidemiology, clinical signs, postmortem, sampling and diagnostic methods, treatment, and preventative measures. Evaluate lists of differential diagnoses and come up with tentative diagnosis. Apply national and international disease control measures in terms of existing legislation. Most of the practicals will involve the students in assisting the veterinarian in the examination, diagnosis, and treatment as well as prevention of the diseases studied in the theory. When specific disease conditions are not seen in the live animals, video tapes will be used to supplement the students practical learning. Students will be guided in the use of epidemiological surveys and investigations including the collection and recording of data related to the diseases studied.</p>		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHPM312	SEMESTER 1	NQF Level: 7
Title: Epidemiology		
Module outcomes:		
<p>Students should be able to explain the importance of epidemiology in disease surveillance, prevention and control. Explain and demonstrate epidemiologic concepts as they relate to disease surveillance, prevention and control. Describe the laws that pertain to veterinary practice. Practical will involve students practising relevant aspects of what they covered during theory classes as stipulated above. Video and other teaching aids may be be used to supplement the students practical learning.</p>		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		

MODULE CODE: AHPM313	SEMESTER 1	NQF Level: 7
Title: Obstetrics and Genital Diseases		
Module outcomes: Students should be able to describe the fundamental concepts of the reproductive cycles of domestic animals, and the factors which influence them. Describe the diseases and conditions causing infertility in production and companion animals and know how to prevent them. Describe the physiology of gestation and parturition, and its related problems. Practicals will involve assisting the veterinarian with clinical cases involving obstetrical procedures for relieving dystocia, treatments associated with dystocia, assisting with dystocia, retained placentas, fertility examinations, semen evaluations, sheath washes, and other clinical cases related to obstetrics and reproductive diseases.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHPM318	SEMESTER 1	NQF Level: 7
Title: Introduction to Game and Wildlife		
Module outcomes: Demonstrate detailed knowledge and understanding of the principles, habitat, game capture, physiology & chemistry; nutrition, disease, toxic plants & soil; vegetation, carrying capacity & game reserve management; demonstrate knowledge and understanding of clinical techniques, preventions considerations used in game and wildlife care; identify, analyse and solve problems in the context of game and wild life care; and communicate and debate information and solutions to problems in this particular field of study.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHPM322	SEMESTER 2	NQF Level: 7
Title: Parasitology		
Module outcomes: Students should be able to describe the basic aspects of the commonly encountered internal and external parasites. Describe the basic classes of the commonly encountered helminths (nematodes, trematodes, cestodes) .Describe the basic classes of the commonly encountered ticks, mites, insects and lice of veterinary importance		
Treatment and control for external parasites. Treatment and control of helminths using both oral and injectable medication Practicals: Identification of helminths, and/ or eggs from faecal samples Identification of external parasites; including ticks, tick counts, mites, insects and lice Dipping for external parasites Ability to apply the acquired knowledge to conduct research,		
Method of delivery : contact lecturers, practical in laboratory and farms, videos		
Assessment Methods: Assessment modes: Assignments, Quizzes, Tests, Examinations		

MODULE CODE: AHPM323	SEMESTER 2	NQF Level: 7
Title: Pharmacology and Toxicology: Animal Health		
Module outcomes:		
<p>Students should be able to explain the fundamental pharmacokinetic and toxicokinetic concepts of common medicines, toxic plants and poisons. Explain the general modes of action of common medicines, toxic plants, poisons and relate them to the respective effects and clinical signs. Explain the basic diagnostic methods and treatments in cases of poisoning. Assist the veterinarian in the treatment of sick animals using the various medications, as well as in the treatment of common intoxications. Practicals will involve use of the different routes of administration of medication including subcutaneous, intramuscular, intravenous, intra-peritoneal, epidural, intra-mammary, sub-conjunctival, topical and oral. Restraint and the assistance of the veterinarian in drug administration. Identification of common toxic plants, poisons, heavy metals, organophosphates, rodenticides and others'</p>		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHPM315	SEMESTER 1	NQF Level: 7
Title: Public Health for Animal Health I		
Module outcomes:		
<p>Students should be able to describe the measures that ensure that water and food of animal origin is free from pathogens and toxins. Advise farmers on concepts of safe and hygienic food production. Demonstrate knowledge of the relevant national and international legislation regarding the management of food-borne and zoonotic diseases. Describe the gross anatomy of a slaughter carcass. Describe the abattoir slaughter procedures. Describe the abattoir hygiene processes. Describe the basic procedure of meat inspection in an abattoir. Describe the statutory requirements and obligations of animal health technicians in terms of the relevant acts. Describe the life cycles, epidemiology, treatment and control measures of the common zoonosis, as learnt from Diseases modules, including but not limited to rabies, anthrax, brucellosis, Rift Valley fever, tapeworms and hookworms. In practical sessions there shall be visits to all categories and grades of abattoirs in and around the province. Visits to dairies, dairy processing plants. Interaction with public health officials, meat and dairy inspectors, and others involved in regulatory public health services.</p>		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHPM325	SEMESTER 2	NQF Level: 7
Title: Clinical Laboratory Techniques		
Module outcomes:		
<p>Module outcomes: Students should be able to explain the basic laboratory techniques. Demonstrate the basic theoretical and practical laboratory diagnostic skills. In practical sessions students do blood smear preparation and evaluation, faecal flotation preparation and evaluation, haematocrit preparation and evaluation. Urine samples evaluation, sediment staining and evaluation, bacteria cultures and sensitivity testing, media preparation, specimen preservation and storage. Milk testing, somatic cell counts, rumen fluid evaluation, skin scrapings for all species, clinical chemistry. Students will practice in the lab the procedures studied in the theory of the various courses. Practice of collection, preservation and preparation of samples for dispatch to the various kinds of laboratories. The ideal situation for doing these procedures will be practised by outsourcing staff from government laboratories and the use of demonstration videos.</p>		
<p>Demonstrate the knowledge and application of basic laboratory practices on samples brought to the laboratory and also by way of assignments. Furthermore be able to apply the laboratory principles learnt in carrying out a research methodology projects.</p>		

Method of delivery: Lectures (power point), Practicals, videos and visits to other laboratories.		
Assessment modes: Assignments, Practicals, Quizzes, Tests, written and practical Examinations		
MODULE CODE: AHPM326	SEMESTER 8	NQF Level: 5
Title: Livestock Diseases (For Animal Science)		
Module outcomes:		
<p>Students should be able to define the common terms used to describe diseases and conditions in farm animals. Describe the fundamental concepts of diseases in farm animals. Discuss the main bacterial, viral, rickettsial, and protozoal infections of farm animals. Describe the influence of nutrition, genetics, and environment on disease occurrence. Describe the important toxic principles and metabolic diseases of farm animals. Most of the practicals will involve the students in assisting the veterinarian in the examination, diagnosis, and treatment as well as prevention of the diseases studied in the theory. When specific disease conditions are not seen in the live animals, video tapes will be used to supplement the students practical learning. Students will be guided in the use of epidemiological surveys and investigations including the collection and recording of data related to the diseases studied.</p>		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHPM411	SEMESTER 1	NQF Level: 8
Title: Companion Animal Medicine & Surgery I		
Module outcomes:		
<p>Students should be able to perform emergency procedures on companion animals prior to attendance by a veterinarian. Perform primary health care procedures on companion animals. Communicate preventative and control methods to clients. Assist veterinarians during surgery, diagnostics, and treatment of animals. In practical sessions learners do the following; vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.</p>		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
MODULE CODE: AHPM421	SEMESTER 2	NQF Level: 8
Title: Companion Animal Medicine & Surgery II		
Module outcomes:		
<p>Students should be able to perform further emergency procedures on companion animals prior to attendance by a veterinarian. Perform further primary health care procedures on companion animals. Communicate preventative and control methods to clients. Assist veterinarians during surgery, diagnostics, and treatments. In practical sessions learners do the following; vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.</p>		

Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
MODULE CODE: AHPM327	SEMESTER 2	NQF Level:7
Title: Veterinary Jurisprudence		
Module outcomes: At completion of this module students should be able to: demonstrate integrated knowledge and understanding of legislation governing the veterinary and para-veterinary laws in the world and in South Africa; demonstrate knowledge of the application of legislation in the control of diseases and the role of animal health technicians; demonstrate the ability to formulate and write legal documents; understand the concept of animal welfare and animal welfare assessment of both farm animals and companion animals; and apply knowledge of procedures and legislation to deal with trading, animal protection and insurance and critically reflect and communicate theory driven arguments.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHPM412	SEMESTER 1	NQF Level: 8
Title: Production Animal clinical care for AHT I		
Module outcomes: Students should be able to perform fundamental emergency procedures on production animals prior to attendance by a veterinarian. Perform primary health care procedures on production animals. Communicate preventative and control methods to clients. Assist veterinarians during surgery, diagnostics, and treatment of animals. In practical sessions learners do the following; vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		
MODULE CODE: AHPM422	SEMESTER 2	NQF Level: 8
Title: Production Animal clinical care for AHT II		
Module outcomes: Students should be able to perform further emergency procedures on production animals prior to attendance by a veterinarian. Perform further primary health care procedures on production animals. Communicate preventative and control methods to clients. Assist veterinarians during surgery, diagnostics, and treatments. In practical sessions learners do the following; vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination. Students will practice the procedures studied in the various theory courses so that they are able to work with all species of animals in a relaxed and professional way with a minimum of risks of injury to the animal, the client or themselves.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, written and practical Examinations		

MODULE CODE: AHPM317	SEMESTER 1	NQF Level: 7
Title: Pathology I		
Module outcomes: Students should be able to explain the fundamental concepts of clinical pathology. Differentiate between the general normal and abnormal organ structures during postmortem procedures, and also be able to collect and dispatch specimens, in addition to proper disposal and disinfection of carcasses and pollution sites. Explain the general anatomical and functional structures of the body and the associated pathology. In practical sessions learners will observe the following, Functional osteology, teeth and ageing, applied anatomy of the head, practical anatomy and gross pathology of the respiratory and circulatory systems, lymphoid tissues, pathology of the central nervous system and vertebral column. Gross pathology of the gastrointestinal tract and related abdominal organs, clinical anatomy of the hoof, functional anatomy and gross pathology of the male and female genital tracts. Palpation and/or observation where applicable on the live animal of the systems and organs, and gross pathology of the various systems, organs and tissues during post mortem examinations. Specimen collection, storage and dispatch. Carcass disposal. Clinical pathology procedures, and results interpretation. Safety and occupational health procedures.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHBM321	SEMESTER 2	NQF Level: 7
Title: Research Methodology		
Module outcomes: Students should be able to perform further emergency procedures on companion animals prior to attendance by a veterinarian. Perform further primary health care procedures on companion animals. Communicate preventative and control methods to clients. Assist veterinarians during surgery, diagnostics, and treatments. In practical sessions learners do the following; vital signs, clinical exam, first aid, general patient management, wound management, supportive care, treatment techniques for the different species, fluid therapy, monitoring the patient, administration of medication, assisting with surgical cases, pre- and postoperative care, care of deliberated animals, physical therapy, surgical instrument management, care of equipment, collection of samples for laboratory examination.		
MODULE CODE: AHPM329	SEMESTER 2	NQF Level: 7
Title: Pathology II		
Module outcomes: Students should be able to explain additional fundamental concepts of clinical pathology. Perform additional postmortem procedures, and also be able to collect and dispatch specimens, together with the proper disposal and disinfection of carcasses and pollution sites. In practical sessions students perform the following, post mortem procedures, specimen collection, storage and dispatch. Carcass disposal. Clinical pathology procedures, and results interpretation. Safety and occupational health procedures.		
Method of delivery: Lectures (power point), videos and practicals		
Assessment modes: Assignments, Quizzes, Tests, Examinations		

MODULE CODE: AHPM414	SEMESTER 1	NQF Level: 8
Title: Practical Experiential Learning I		
Module outcomes: Students should be able to relate what they learnt during the entire degree curriculum with the actual field situations under supervision of professionals in various fields of animal health and production. Modalities; students will be required to spend 2 weeks in the field (outside the University) in an approved laboratory, registered veterinary clinic, state veterinary office, wildlife park and other such stations under the supervision of qualified veterinarians, game rangers or game veterinarian. The period will fall during the vacation. Students will also work at the University farm under the supervision of the farm sectional managers, the farm manager and animal health staff members at prescribed times during the semester. One of the two sessions (between PRACTICAL EXPERIENTIAL LEARNING I and II should be conducted under a veterinarian or an animal health technician working first hand with treatment and control of animal diseases.		
Method of delivery: Lectures (power point), videos and practicals on different farms and stations		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHPM424	SEMESTER 2	NQF Level:8
Title: Practical Experiential Learning II		
Module outcomes: Students should be able to further relate what they learnt during the entire degree curriculum with the actual field situations under supervision of professionals in various fields of animal health and production. Modalities; students will be required to spend 2 weeks in the field (outside the University) in an approved laboratory, registered veterinary clinic, state veterinary office, wildlife park and other such stations under the supervision of qualified veterinarians, game rangers or game veterinarian. The period will fall during the vacation. sectional managers, the farm manager and animal health staff members at prescribed times during the semester.		
One of the two sessions (between PRACTICAL EXPERIENTIAL LEARNING I and II should be conducted under a veterinarian or an animal health technician working first hand with treatment and control of animal diseases.		
Method of delivery: Lectures (power point), videos and practicals on different farms and stations		
Assessment modes: Assignments, Quizzes, Tests, Examinations		
MODULE CODE: AHPM415	SEMESTER 1	NQF Level: 8
Title: Research Project And Seminar I		
Module outcomes: Students should be able to explain the fundamental concepts of projects planning, research methodologies, produce a literature review and present project proposals. Evaluate scientific literature.		
Method of delivery: full time research		
Assessment Methods: proposal submission and presentation		
MODULE CODE: AHPM425	SEMESTER 2	NQF Level: 8
Title: Research Project And Seminar II		
Module outcomes: Students should be able to produce a written mini-dissertation from their research projects. Present their mini-dissertations orally		
Method of delivery: full time research		
Assessment modes: Mini dissertation submission		

MODULE CODE: AHPM426	SEMESTER 2	NQF Level: 8
Title: Scheduled Diseases		
Module outcomes: Students should be able to describe and perform procedures relating to the Tuberculosis (TB) and Contagious Abortion (CA) eradication schemes as prescribed by the National Department of Agriculture. Describe the general concepts of Scheduled Diseases and current disease outbreaks. Practical; prescribed field tests, sampling procedures using relevant materials and equipment and interpretation of results. Video shows of current disease outbreaks may be used.		
Method of delivery: Lectures (power point), group discussions		
Assessment modes: Assignments, Quizzes, Tests, Examinations		

NAS.2.3 DIPLOMA IN ANIMAL SCIENCE

Module code: ANDM121	Semester 2	NQF level: 5
Title: Introduction to Animal Science		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the South African animal science industry overview. Explain the role of animal science to economic and human development. Classify farm animals based on climate, size, gastro-intestinal tract, feeding behaviour and production. Differentiate between breeds of farm animals. Discuss location of animals to different geographical areas based on their adaptability. Explain the basic introductory principles of the physiology of growth and development, reproduction, breeding. Nutrition and health of farm animals.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		

Module code: ANDM122	Semester 2	NQF level: 5
Title: Non – Ruminant Production		
Module outcomes: Upon completion of this module, the learner(s) should be able to demonstrate an understanding of the poultry and pig industry, poultry and pig breeds and their contribution to animal agriculture. Propose strategies on improvement of poultry production system and appropriate breeds. Develop a comprehensive plan of a poultry production unit health programme. Apply modern management techniques in efficient feeding and rearing of broilers and layers. Evaluate and provide recommendation on monogastric products and their quality and their marketing strategies.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		

Module code: ANDM211	Semester 1	NQF level: 6
Title: Animal Nutrition		
Module outcomes: Upon completion of this module, the learner(s) should be able to compare the roles and functions of different nutrients found in animal feed and explain the importance of animal nutrition. Discuss the role played by nutrients in the health of animals and digestion in ruminants and non-ruminants. Describe the requirements of nutrients for growth, maintenance, reproduction and production. Identify and classify South African feedstuffs based on their nutritive value. Formulate rations for farm animals and justify the need for evaluating feeds.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		

Module code: ANDM212	Semester 1	NQF level: 6
Title: Animal Genetics and Breeding		
Module outcomes: Upon completion of this module, the learner(s) should be able to outline the possible deviations from the expected Mendelian ratios and provide comprehensive explanations for them. Utilize the concept of sex linkage in farming situations. Describe mutations as a source of genetic variation in living organisms. Predict genetic change and describe different selection methods and mating system. Evaluate the importance of cell division in living organisms.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANDM213	Semester 1	NQF level: 6
Title: Ruminant Animal Production		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the South African ruminant industry overview and the economic importance of the ruminant industry in human and economic development. Identify and describe the physical and production characteristics of different breeds of sheep, goats, beef and dairy cattle. Locate different breeds of sheep, goats, beef and dairy cattle to various livestock production systems and climatic conditions. Apply management principles such as rearing systems (calves/lambs/kids), breeding and selection, reproduction and feeding (nutrition) in various ruminant production systems.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANDM221	Semester 2	NQF level: 6
Title: Small Stock Production and Management		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the South African smallstock industry overview and the economic importance of the smallstock industry in human and economic development. Identify and describe the physical and production characteristics of different breeds of sheep and goats. Locate different breeds of sheep and goats, to various livestock production systems and climatic conditions. Apply management principles such as rearing systems (lambs/kids), breeding and selection, reproduction and feeding (nutrition) in smallstock production systems. Develop and evaluate breeding, nutrition, reproduction and health programmes in smallstock.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANDM223	Semester 2	NQF level: 6
Title: Beef Production and Management		
Module outcomes: Upon completion of this module, the learner(s) should be able to recognise the beef cattle industry in South Africa as integrated industry from farm to market place. Characterise beef cattle breeds and their crosses according their biological types and adaptability to specific environments. Develop suitable beef cattle production systems to meet the objective of different farmers. Plan, monitor and critically evaluate, breeding, reproductive, nutritional and health programmes. Manage beef cattle enterprises according to their production systems.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		

Module code: ANDM225	Semester 2	NQF level: 6
Title: Principles of Veld Management		
Module outcomes: Upon completion of this module, the learner(s) should be able to explain the basic principles governing the vegetation development. Justify the need for the practical application of principles in each of the six biome types. Compare and contrast the factors associated with forage quality and how they influences animal performance. Describe the problems of increasing bush encroachment in savanna, with proposals on how to deal with the problem. Discuss the approach to and theoretical basis of veld management on the game ranch. Summarise the management of veld in the communal areas of South Africa.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANDM312	Semester 1	NQF level: 7
Title: Poultry Production and Management		
Module outcomes: Upon completion of this module, the learner(s) should be able to name the sources of breeding material for the different sectors of the poultry industry. Illustrate the structure of the poultry meat and egg industries and their contribution to the supply of meat and eggs for the South African population. Summarize the procedures for the monitoring and management of the environment to ensure ideal conditions during hatching and brooding. Select and apply the procedures for the preparation of poultry house to receive broiler chicks. Implement disinfection and apply management procedures of the broiler house before chick placement. Apply management procedures of the layer house before point-of-lay chickens are placed. Justify reasons for feeding different diets to broilers and layers. Outline the different types of records kept in poultry production. Tabulate and maintain production records on broiler and layer farms, as per company SOP's. Draw a vaccination plan for layers and broilers.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANDM313	Semester 1	NQF level: 7
Title: Dairy Cattle Production and Management		
Module outcomes: Upon completion of this module, the learner(s) should be able to identify dairy cattle breeds, their production characteristics and their economic importance to the South African dairy industry. Integrate dairy cattle breeding, feeding and reproduction for total management of the dairy cattle enterprise. Plan and implement management practices in dairy cattle herds. Formulate, keep and use dairy cattle records system (production and financial). Develop, implement and manage health programmes in dairy herds for prevention and the diagnoses of various diseases for assurance of dairy cattle health.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANDM314	Semester 1	NQF level: 7
Title: Pig Production and Management		
Module outcomes: Upon completion of this module, the learner(s) should be able to differentiate and characterize breeds of pigs and their potential contribution to the Pork Industry in South Africa. Integrate pig production systems with components of pork quality and major aspects of producer to consumer chain in the pig industry. Develop, plan, implement and manage pig breeding and selection, nutrition, reproduction and health programmes for the breeding herd. Evaluate management practices involved in effective feeding, breeding, reproduction, health and housing of pigs as well as their relationship in assuring a profitable pig enterprise.		
Method of delivery: Contact		

Assessment modes: Continuous formative and summative assessments		
Module code: ANDM321	Semester 2	NQF level: 7
Title: Practical Animal Production		
Module outcomes: Upon completion of this module, the learner(s) should be able to apply practical handling skills and management to handle farm animals. Observe and be exposed to major livestock and related industries in Southern Africa. Manage feeding, breeding and keep farm records in assurance of general livestock management. Evaluate animal breeding, nutrition, reproduction and health programmes. Assess the viability, economic outlook and current situations of subsistence and commercial livestock farm enterprises. Write a scientific report about the work experience done.		
Method of delivery: Visits to farm facilities for hands on practical		
Assessment modes: Assignments and mentor's report		

NAS.2.4 BSC AGRIC IN ANIMAL SCIENCE

Module code: ANSM121	Semester 2	NQF level: 5
Title: Introduction to Agricultural Biometry		
Module outcomes: Upon completion of this module, the learner(s) should be able to summarize data in the form of graphs and descriptive statistics. Solve probability application problems in agriculture. Differentiate random variables and associated distributions, relationship between population and samples within context of Central Limit Theorem. Write statistical hypothesis, carryout analyses and test hypotheses based on simple statistical procedures.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM211	Semester 1	NQF level: 6
Title: Introduction to Animal Science		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the South African animal science industry overview. Explain the role of animal science to economic and human development. Distinguish, Identify and differentiate breeds of farm animals used in South Africa and modes of animal classification. Justify why breeds of farm animals are located in different environments based on their adaptability features and mechanism. Summarise the basic introductory principles of the physiology of growth and development, reproduction, breeding. Nutrition and health of farm animal.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM214	Semester 1	NQF level: 6
Title: Ruminant Animal Production		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the South African ruminant industry overview. Describe the economic importance of the ruminant industry in human and economic development. Identify and describe the physical and production characteristics of different breeds of sheep, goats, beef and dairy cattle. Locate different breeds of sheep, goats, beef and dairy cattle to various livestock production systems and climatic conditions. Explain the role and application of management principles such as rearing systems (calves/lambs/kids), breeding and selection, reproduction and feeding (nutrition) in various ruminant production systems.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		

Module code: ANSM222	Semester 2	NQF level: 6
Title: Animal Genetics and Breeding		
Module outcomes: Upon completion of this module, the learner(s) should be able to evaluate the importance of cell division in living organisms. Describe how genetic information is carried and passed on from one generation to next. Explain the basis of how genetic information is inherited using the principles of Mendel and relate phenotype to genetic makeup. Outline the possible deviations from the expected Mendelian ratios and provide comprehensive explanations for them.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM223	Semester 2	NQF level: 6
Title: Animal Nutrition		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the importance of animal nutrition and explain the processes of digestion, absorption and metabolism in ruminants and non-ruminants and their end products. Identify, classify and distinguish the main components of feed of plant and animal origin consumed by farm animals and South African feedstuff according to their nutritive value. Summarize role played by nutrients in the health of animals and the importance of enzymes in animal nutrition. Solve problems related to the determination of the nutrient content of feeds using proximate system of analysis. Justify the importance of conducting digestibility trials.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM225	Semester 2	NQF level: 6
Title: Non-Ruminant Production Science		
Module outcomes: Upon completion of this module, the learner(s) should be able to demonstrate an understanding of the poultry and pig industry, poultry and pig breeds and contribution in agriculture. Evaluate and provide recommendation on monogastric products and their quality and marketing. Develop a comprehensive plan of a poultry production unit health programme. Propose strategies on improvement of poultry production system and appropriate breeds. Apply modern management techniques in efficient feeding and rearing of broilers and layers.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM311	Semester 1	NQF level: 7
Title: Principles of Veld Management		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the growth and developmental morphology of forages. Compare and contrast the different types of grazing systems in veld management. Explain the processes of plant succession. Identify and explain the veld ecosystem components and their functions. Summarise the procedures for the production of hay and silage and be able to suggest a fodder production and preservation plan given specific Farm condition. Differentiate grassland management in different veld types and identify the major grouping of veld types in S.A. and be aware of their nutritional value. Justify the need for rangeland monitoring and awareness of the behaviour of ruminants on grazing as well as the need for grazing in livestock production.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		

Module code: ANSM312	Semester 1	NQF level: 7
Title: Applied Agricultural Biometry		
Module outcomes: Upon completion of this module, develop appropriate statistical hypothesis and design for different research problems, recognize when and how to apply some widely used hypotheses testing procedures, apply analysis of variance (ANOVA) procedures to test hypotheses from widely recognized experimental designs in agriculture, able to critique experimental design of published research articles in agricultural research.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM313	Semester 1	NQF level: 7
Title: Agricultural Biochemistry		
Module outcomes: Upon completion of this module, the learner(s) should be able to, describe the biochemical importance of water and its ionization products in the body. Differentiate different solutions into basic or acidic medium solutions based on their pH. Differentiate between proteins, carbohydrates, lipids, nucleic acids and vitamins on the basis of their elementary composition and biochemical importance. Distinguish the components of DNA & RNA, recognise the genetic implications of several enzymes in key metabolic process and the vital importance of the mechanism of enzyme synthesis within the cell.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM314	Semester 1	NQF level: 7
Title: Physiology of Reproduction and Growth		
Module outcomes: <ul style="list-style-type: none"> • Upon completion of this module, the learners should be able to identify reproductive systems of the female and male animals and conceptualise their functions. • Integrate the physiological mechanisms that regulate reproduction in farm animals. Summarise the process of fertilisation, gestation and parturition in farm animals. • Apply reproductive technologies to improve and manage reproduction in farm animals and solve problems related to reproduction in farm animals. • Evaluate growth and development in domestic animals Evaluate factors affecting growth (prenatal and postnatal) and technologies to improve growth in farm animals.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM321	Semester 2	NQF level: 7
Title: Applied Ruminant Nutrition		
Module outcomes: Upon completion of this module, the learner(s) should be able to solve and produce digestibility results using different feed in ruminant animals and also be able to discuss factors affecting digestibility. Describe the system expressing the energy value of food for ruminants. Summarize the fate of dietary crude protein in the ruminant animals and justify the need for nutrient requirements of the lactating dairy cows. Compare and contrast factors affecting voluntary intake of food in ruminant. Create a diet formulation among different types of feed and distinguish among various types of secondary compounds in feed.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		

Module code: ANSM322	Semester 2	NQF level: 7
Title: Planted pastures and Fodder crops		
Module outcomes: Upon completion of this module, the learner(s) should be able to explain and describe the role of planted pastures and crops. Evaluate the basic principles concerning establishment of planted pastures. To analyze and plan a basic fertilization program for planted pastures and fodder crops. To discuss weed control program in establishing cultivated pastures. To analyze and choose a specific pasture species for a specific situation. Identify species available on market and how species fit into a fodder flow program.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM323	Semester 2	NQF level: 7
Title: Quantitative Genetics		
Module outcomes: Upon completion of this module, the learner(s) should be able to apply the principles of gene and genotypic frequency determination procedures for economically important traits in livestock population; demonstrate understanding of statistical principles as applied to quantitative traits; Use the procedure for testing breeding animals for undesirable genetic defects. Know the basic principles, application and procedures of estimating heritability, repeatability, genetic and phenotypic correlations for various economically important traits in livestock; master the procedure of estimating breeding values; response to selection and dissemination of genetic gain in livestock population.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM326	Semester 2	NQF level: 7
Title: Small Ruminant Production Science		
Module outcomes: Upon completion of this module, the learner(s) should be able to describe the small ruminant industry and its economic importance in human and economic development. Identify and describe the physical and production characteristics of different breeds of sheep and goats. Locate different breeds of sheep and goats, to various livestock production systems and climatic conditions. Explain the role and application of management principles such as rearing systems (lambs/kids), breeding and selection, reproduction and feeding (nutrition) in small ruminant production systems. Explain the principles of marketing in sheep and goats enterprise.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM412	Semester 1	NQF level: 8
Title: Applied Animal Breeding		
Module outcomes: Upon completion of this module, the learner(s) should demonstrate understanding of fundamental principles, theory, concept and procedures associated with inbreeding and crossbreeding as mating systems in genetic improvement of farm animals, analyse animal performance and pedigree data to estimate, genetic parameters (heritability and genetic correlations), breeding values, genetic gains, inbreeding effects and crossbreeding outcomes for a given livestock population; review and summarize scientific publications regarding genetic parameters, breeding values, inbreeding effects and crossbreeding values for economically important traits in livestock.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		

Module code: ANSM416	Semester 1	NQF level: 8
Title: Applied Non-Ruminant nutrition		
Module outcomes: In completion of this module learners will be able to explain and describe the digestive tract of pigs, horses, poultry, horse and rabbits; summarise feeding management of non-ruminants; discuss the use of feed additives classes as drugs; briefly discuss nutritional management and environmental pollution in non-ruminants animals; analyse the gaps and solve problems related to the quality of livestock.		
Method of delivery: contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM415	Semester 1	NQF level: 8
Title: Beef Production Science		
Module outcomes: Upon completion of this module, the learner(s) should be able to recognise the economic important role of the large stock industry in South Africa. Plan, monitor and critically evaluate, breeding, reproductive, nutritional and health programmes. Design, recommend and use large stock facilities, equipment and buildings. Develop, plan, implement and manage large stock enterprise according to their production systems. Implement animal health programmes to assure preventative measures to various diseases.		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM423	Semester 2	NQF level: 8
Title: Practical Experience		
Module outcomes: After the completion of this module, the student should be able to:		
<ol style="list-style-type: none"> 1. Apply practical handling skills and management to handle farm animals through observations and exposure to major livestock and related industries in Southern Africa. Manage feeding, breeding and keep farm records in assurance of general livestock management. Evaluate animal breeding, nutrition, reproduction and health programmes. Assess the viability, economic outlook and current situations of subsistence and commercial livestock farm enterprises. Write a scientific report about the work experience. Integrates academic learning with its application in the workplace that is, combining theory with practice as part of an enrolled program of study. WIL makes a significant contribution to our graduates' work and industry-readiness. 2. Partner with industry, community, government and other educational providers on and offshore. 		
Method of delivery: Contact		
Assessment modes: Students are to submit a report of all activities done during the time and will carry a cumulative weight of 50%. The assessment by the mentor using a standard assessment tool as approved by the Animal Science department will also carry a cumulative weight of 50%. The 50% of the report and the 50% of the mentor's assessment tool will then be added to give a final mark. A student will have passed the module if the final mark is 50%.		
Module code: ANSM426	Semester 2	NQF level: 8
Title: Pig Production Science		
Module outcomes: Upon completion of this module, the learner(s) should be able to recognise the potential contribution of the South African Pork industry to animal protein production. Integrate pig production systems with components of pork quality and major aspects of producer to consumer chain in the pig industry. Develop, plan, implement and manage pig breeding and selection, nutrition, reproduction and health programmes for the breeding herd.		

<p>Develop, plan, implement and manage large stock enterprise according to their production systems. Evaluate management practices involved in effective feeding, breeding, reproduction, health and housing of pigs as well as their relationship in assuring a profitable pig enterprise.</p> <ul style="list-style-type: none"> • Intergrade pig production practises and the pillars of sustainable pig production, namely environmental, economic and socio-cultural sustainability 		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM427	Semester 2	NQF level: 8
Title: Poultry Production Science		
<p>Module outcomes:</p> <p>Upon completion of the module, learners should be able to demonstrate understanding of the importance of the external and internal anatomical features and physiology of the chicken. Demonstrate the ability to successfully use a hatchery to incubate and hatch eggs. Differentiate the methods of housing poultry and be able to match the housing system with the environment and management. Describe how poultry waste must be managed. Differentiate between feeding methods of layers and broilers. Draw a vaccination plan for layers and broilers. Outline a marketing strategy for poultry products. Apply modern management techniques in efficient feeding and rearing of broilers and layers. Develop a poultry production unit health programme.</p>		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM428	Semester 2	NQF level: 8
Title: Dairy Production Sciences		
<p>Module outcomes:</p> <p>Upon completion of this module, the learner(s) should be able to outline the history and development of the South African dairy industries and identify factors affecting production and composition of milk. Integrate the principles and factors involved in dairy production. Summarise the physiological mechanism mammogenesis, lactogenesis, galactopoesis, milk secretion and involution. Analyse quality control and regulations in production and processing of dairy products. Evaluate milking parlour and equipment as well as system analysis and operation.</p>		
Method of delivery: Contact		
Assessment modes: Continuous formative and summative assessments		
Module code: ANSM479	Semester 1	NQF level: 8
Title: Research Project		
<p>Module outcomes:</p> <p>After the completion of this Research module, the student should be able to:</p> <ul style="list-style-type: none"> • Demonstrate in-depth knowledge of the research methodology in the field of Animal Science Research, plan and perform investigations and experiments by utilizing scientific modelling techniques, analyze, interpret and derive information from data and apply appropriate scientific methods to evaluate the results. • Demonstrate specialist knowledge in the field of Animal Science Research to enable engagement with and critique of current research or practices in combination with advanced scholarship or research in specific fields within the Animal Science discipline. • Identify, evaluate and creatively and innovatively address, under supervision, certain convergent and divergent problems in Animal Science; • Understand the consequences of solutions or insights generated within the context of Animal Science, be able to make autonomous ethical decisions which affect knowledge production or complex organisational or professional issues, and make critical contributions to the development of ethical standards; 		

- Communicate and defend ideas and results that are the products of the research in the field of Animal Science and use a range of advanced and specialised skills to communicate to a range of audiences with different levels of knowledge or expertise;
- Operate independently and take full responsibility for his/her own as well as others' work, and, where appropriate, to account for leading and initiating processes and implementing systems.

Method of delivery: Contact

Assessment modes: Continuous formative assessment (in the form of assignments and oral presentations) is aimed at determining the student's progress towards attaining the stipulated outcomes. The student's ability to use and apply specific methodological skills is furthermore evaluated in his/her critical review of current literature in the subject area and the formulation and execution of a research project. The student is to report on it and generate an integrated dissertation of research findings. The supervisor assesses continuously while the dissertation is being written. Examination of the dissertation is finally done by at least one external examiners, who is an experts in the Animal Science field of specialization. A supervisor is not appointed as an examiner.

This module consists of two components i.e. a research proposal and a research mini dissertation. All of the formative assessment tasks mentioned above (with a cumulative weight of 50%) will be used to calculate the final mark of each student for this module. The external examiner will provide a mark in the form of a percentage that will have a cumulative weight of 50%. The 50% of the research proposal and 50% from the external examiner will be added and will serve as a final mark for this module. A student will have passed the module if the addition of two formative assessments adds up to 50%.

Module code: ANSM427

Semester 2

NQF level: 8

Title: Poultry Production Science

Module outcomes:

Learner(s) should be able to demonstrate an understanding of the poultry industry, poultry breeds and contribution in animal agriculture. Evaluate and provide recommendation on poultry egg and meat quality and implement the marketing strategies in poultry enterprises. Develop a comprehensive plan of a poultry production unit health programme. Propose strategies on improvement of poultry production system and appropriate breeds. Apply modern management techniques in efficient feeding and rearing of broilers and layers.

Method of delivery: Contact

Assessment modes: Continuous formative and summative assessments

Module code: ANSM428

Semester 2

NQF level: 8

Title: Dairy Production Sciences

Module outcomes:

Upon completion of this module, the learner(s) should be able to outline the history and development of the South African dairy industries and identify factors affecting production and composition of milk. Integrate the principles and factors involved in dairy production. Summarise the physiological mechanism mammogenesis, lactogenesis, galactopoesis, milk secretion and involution. Analyse quality control and regulations in production and processing of dairy products. Evaluate milking parlour and equipment as well as system analysis and operation.

Method of delivery: Contact

Assessment modes: Continuous formative and summative assessments

Module code: ANSM479	Semester 1	NQF level: 8
Title: Research Project		
<p>Module outcomes:</p> <p>After the completion of this Research module, the student should be able to:</p> <ul style="list-style-type: none"> • Demonstrate in-depth knowledge of the research methodology in the field of Animal Science Research, plan and perform investigations and experiments by utilizing scientific modelling techniques, analyze, interpret and derive information from data and apply appropriate scientific methods to evaluate the results. • Demonstrate specialist knowledge in the field of Animal Science Research to enable engagement with and critique of current research or practices in combination with advanced scholarship or research in specific fields within the Animal Science discipline. • Identify, evaluate and creatively and innovatively address, under supervision, certain convergent and divergent problems in Animal Science; • Understand the consequences of solutions or insights generated within the context of Animal Science, be able to make autonomous ethical decisions which affect knowledge production or complex organisational or professional issues, and make critical contributions to the development of ethical standards; • Communicate and defend ideas and results that are the products of the research in the field of Animal Science and use a range of advanced and specialised skills to communicate to a range of audiences with different levels of knowledge or expertise; • Operate independently and take full responsibility for his/her own as well as others' work, and, where appropriate, to account for leading and initiating processes and implementing systems. 		
Method of delivery: Contact		
<p>Assessment modes: Continuous formative assessment (in the form of assignments and oral presentations) is aimed at determining the student's progress towards attaining the stipulated outcomes. The student's ability to use and apply specific methodological skills is furthermore evaluated in his/her critical review of current literature in the subject area and the formulation and execution of a research project. The student is to report on it and generate an integrated dissertation of research findings. The supervisor assesses continuously while the dissertation is being written. Examination of the dissertation is finally done by at least one external examiners, who is an experts in the Animal Science field of specialization. A supervisor is not appointed as an examiner.</p> <p>This module consists of two components i.e. a research proposal and a research mini dissertation. All of the formative assessment tasks mentioned above (with a cumulative weight of 50%) will be used to calculate the final mark of each student for this module. The external examiner will provide a mark in the form of a percentage that will have a cumulative weight of 50%. The 50% of the research proposal and 50% from the external examiner will be added and will serve as a final mark for this module. A student will have passed the module if the addition of two formative assessments adds up to 50%.</p>		
Module code: CSDM111	Semester 1	NQF LEVEL 5 CREDITS 12
Title: Botany for Agriculture		
<p>Module outcomes:</p> <p>Learners will be able to describe basic plant taxonomy, morphology, and anatomy and function in plants. Learners will be able to outline the principles of classification including concepts of species, genus, family, order, division and kingdom, binomial system of nomenclature. Learners will be able to understand the processes of photosynthesis and transpiration. Learners will be able to explain the relationship between plant botany, genetics and plant breeding.</p> <p>Method of delivery: Contact - lectures, discussions, seminars, PowerPoint</p> <p>Assessment modes</p>		

Assignments, class tests, quizzes, practicals, term papers, final end of semester examination		
Module code: CSDM121	Semester 2	NQF LEVEL 5 CREDITS 12
Title: Introduction to Crop Production		
Module outcomes: Learners will be able to appreciate the importance of crop plants in human welfare. Learners will be able to understand the objectives of crop production and be familiar with the basic concepts of crop production strategies relating to yield and quality. Learners will be knowledgeable about tillage practices and concerns about sustainable crop production and practices aimed at achieving sustainability and are familiar with fertilizer types, rates and methods of application and know the different soil factors affecting crop production.		
Method of delivery: Contact - lectures		
Assessment modes: Tests, assignments ,practical assessments and examination		
Module code: CSDM211	Semester 1	NQF LEVEL 6 CREDITS 16
Title: Intro to Soil Science		
Module outcomes: Students will be able to demonstrate an understanding of soil as a natural entity for sustainable agriculture as they study each of the areas of soil science: soil genesis, soil physics, soil conservation, soil microbiology, soil chemistry, and soil fertility. Knowledge of these soil properties will enable students to gain basic understanding of soils and their importance and relevance in different areas of agriculture. They will therefore be able to appreciate soils as a natural resource for South Africa and for the world. Students will develop an understanding of the role that soils play in the agricultural and economic situation in South Africa and the world.		
Method of delivery: Contact – teaching, powerpoint presentations		
Assessment modes: Tests, assignments ,practical assessments and examination		
Module code: CSDM212	Semester 1	NQF LEVEL 6 CREDITS 12
Title: Agricultural Climatology		
Module outcomes: Ability to describe the basic weather elements in agriculture, their measurement and influence on crop and animal production in the North West Province, South Africa and the world at large. Ability to collect and summarize the basic weather elements in agriculture.		
Method of delivery: Contact - Lectures		
Assessment modes: Tests, assignments ,practical assessments and examination		
Module code: CSDM 213	Semester 1	NQF LEVEL 6 CREDITS 8
Title: Farm Machinery		
Module outcomes: Ability to take proper care of farm machinery and implements. Ability to use farm implements and machinery properly. Ability to do minor repairs of farm implements and machinery. Ability to do budgeting of farm operations. Use of equipment used in the construction of farm buildings. An understanding of the construction of farm buildings and the budgeting for construction. Ability to produce simple designs of farm buildings.		
Method of delivery: Contact Lectures		
Assessment modes: Tests, assignments ,practical assessments and examination		

Module code: CSDM215	Semester 2	NQF LEVEL 6 CREDITS 8
Title: Vegetable Production		
<p>Module outcomes: Learners will be able to select and grow vegetables in specific agro-ecological regions of South Africa. Learners will be knowledgeable in the agronomy of major vegetables grown in RSA. Learners should be competent in organic farming principles. Apply theoretical and practical knowledge to guide farmers and gardeners to produce vegetables.</p> <p>Method of delivery: Contact - Lectures</p> <p>Assessment modes: Formal class tests, practical/Field reports, assignments</p>		
Module code: CSDM221	Semester 2	NQF LEVEL 6 CREDITS 16
Title: Principles of Crop Improvement		
<p>Module outcomes: Learners will be able to explain the importance of genetic crop improvement in increasing crop yield and quality and have an appreciation of plant breeder's work. Learners will be able to explain the difference between self- and cross-pollinated crops. Learners will be able to clarify how genetic principles relate to plant breeding methods. Learners will be able to outline and explain seed certification and multiplication principles.</p> <p>Method of delivery: Contact - lectures, discussions, seminars, PowerPoint</p> <p>Assessment modes Formative : – assignments, class tests, quizzes, practicals, term papers Summative: – final end of semester examination</p>		
Module code: CSDM222	Semester 2	NQF LEVEL 6 CREDITS 16
Title: Soil fertility and Fertilizers		
<p>Module outcomes: Students will be able to demonstrate strong knowledge of how soil conditions affect plant growth and suggest possible management practices to increase crop yield. . Students will gain knowledge of the 17 essential elements required for plant growth in regards to factors which affect nutrient availability in soils. Students will be able to evaluate the fertility status of soils and make subsequent fertilizer recommendations.</p> <p>Method of delivery: Contact – teaching, powerpoint presentations, excursions to complement teaching</p> <p>Assessment modes: Tests, assignments ,practical reports and examination</p>		
Module code: CSDM223	Semester 2	NQF LEVEL 6 CREDITS 12
Title: Soil Conservation		
<p>Module outcomes: Learners will be able to describe various types of land degradation and how they are caused, as well as identify and assess different stages and forms of soil degradation. They will also have an understanding of how different soil management practices affect soil quality and the role that these have on agricultural productivity. Students at the end of the module will be able to identify and describe different strategies used in soil conservation.</p> <p>Method of delivery: Contact Lectures</p> <p>Assessment modes: Tests, assignments, reports and examination</p>		

Module code CSDM224	Semester 2	NQF LEVEL 6 CREDITS 8
Title: Farm practical II		
Module outcomes: Practical skills in the production of vegetable and field crops. Ability to identify weeds, insects and diseases associated with vegetable and field crops. Application of appropriate control measures for pests. Irrigation and fertilizer management in the production of vegetables and field crops. Ability to select and correctly use farm implements and machinery for various cultural practices mainly for field crops. Harvesting, sorting and grading crop products for marketing. Business plan for field crops. Yield estimations for field crops. Design of crop rotation programmes for field crops.		
Method of delivery: Contact - Hands-on field activities, field trips and excursion		
Assessment modes: Practical and field trip reports		
Module code: CSDM225	Semester 2	NQF LEVEL 6 CREDITS 8
Title: Fruit Production		
Module outcomes: Ability to identify different fruit crops. Apply theoretical and practical knowledge in the production and cultural practices of fruit crops. Be competent in the fruit propagation techniques such as budding and grafting, harvesting, grading storage and marketing of fruit produce. Learners should be knowledgeable in the role of plant hormones in the growth, flowering and ripening of fruits. Learners should be skilled in basic post-harvest fruit processing techniques.		
Method of delivery: Contact – lectures,		
Assessment modes: Formal class tests, practical/Field reports, assignments		
Module code: CSDM311	Semester 1	NQF LEVEL 7 CREDITS 8
Title: Agronomy of Summer Crops		
Module outcomes: For each prescribed summer crop, learners will be able to know its origin, economic importance, distribution and morphology, know its climatic and soil requirements and its appropriate cultural practices.		
Method of delivery: Contact - Lectures		
Assessment modes: Tests, assignments ,practical assessments and examination		
Module code: CSDM312	Semester 1	NQF LEVEL 7 CREDITS 16
Title: Plant protection		
Module outcomes: Ability, understand and interpret the reports on plant Protection. Ability to identify common garden and field pests and diseases. . Come up with appropriate control measures for the identified pests. Learners should be competent in knapsack and boom sprayer calibration. Introduce new information about plant protection to farmers. Guide and supervise farmers regarding plant protection. Understand the quarantine /phytosanitary regulations of RSA.		
Method of delivery: Contact - Lectures		
Assessment modes: Formal class tests, practical/Field reports, assignments		

Module code: CSDM315	Semester 1	NQF LEVEL 7 CREDITS 8
Title: Pedology and Soil Classification		
Module outcomes: Upon completion of the module, learners should be able to: describe the factors and processes involved in the formation of soils, describe the different categories of horizons, explain the principles behind soil classification, explain how diagnostic horizons are employed in the classification of soils, describe the major systems of soil classification and be able to explain how the South African System of Soil Classification fits in other global systems.		
Method of delivery: Contact Lectures		
Assessment modes: Tests, assignments ,practical assessments and examination		
Module code: CSDM321	Semester 2	NQF LEVEL 7 CREDITS 8
Title: Agronomy of Winter Crops		
Module outcomes: For each prescribed winter crop, learners will be able: To know its origin, economic importance distribution, and morphology. To know its climatic and soil requirements. To know its appropriate cultural practices.		
Method of delivery: Contact - Lectures		
Assessment modes: Tests, assignments ,practical assessments and examination		
Module code: CSDM322	Semester 2	NQF LEVEL 7 CREDITS 16
Title: Weeds and Weed Control		
Module outcomes: Ability to identify weed species and come up with weed control measures. To comprehend and interpret literature related to weed control. Supervise and guide farmers how to control weeds. Introduce to farmers new technology of weed control. Understand the use of selective and non-selective herbicides. Be competent in knapsack and boom sprayer calibration.		
Method of delivery: Contact - Lectures		
Assessment modes: Formal class tests, practical/Field reports, assignments		
Module code: CSDM323	Semester 6	NQF LEVEL 7 CREDITS 16
Title: Elements of Agric. Microbiology		
Module outcomes: Upon completion of the module, learners should be able to describe the different groups of microorganisms that are of significance in agriculture. Explain the function of these groups of microorganisms in agricultural productivity, explain how environmental factors and soil management techniques influence the dissemination and control of microorganisms of significance in agriculture and apply knowledge of the ecological and nutritional requirements of the major groups of microorganisms in designing environmentally friendly methods of disease control.		
Method of delivery: Contact – Teaching, provision of lecture notes as powerpoint presentation/slides and assignment topics are pasted on efundu.		
Assessment modes: Assessment is through tests, assignments, practical reports and examination.		

Module code: CSDM324	Semester 6	NQF LEVEL 7 CREDITS 16
Title: Elementary Irrigation		
Module outcomes: Learners will be able to explain the role of irrigation in agriculture. Ability to select an appropriate irrigation system for horticultural and field crops and environment. Diagnostic skills in operation and maintenance of irrigation infrastructure. Agronomic management of irrigated crops. Ability to monitor crop water requirement and schedule irrigation. Ability to manage drainage and salinity problems in irrigation.		
Method of delivery: Contact – lectures,		
Assessment modes: Formal class tests, practical/Field reports, assignments		
Module code: CSDM371	Semester 1	NQF LEVEL 7 CREDITS 8+8
Title: Practical Crop Production Training		
Module outcomes: Practical skills in the production of vegetable. Ability to identify weeds, insects and diseases associated with all aspects of crop production, vegetables, field crops and orchards. Application of appropriate management and control measures for pests and diseases. Irrigation and fertilizer management in the production of vegetables and field crops. Ability to select and correctly use farm implements and machinery for various cultural practice. Harvesting, sorting and grading crop products for marketing. Business plan for vegetable and field crops. Yield estimations for vegetables and crops. Design of vegetable and crop production programme. Ability to layout field trials. Ability to operate farm machinery properly. Ability to calibrate implements properly. Ability to weigh and apply fertilizers properly. Ability to classify soils at particular site. Ability to calculate yield and plant population estimates.		
Method of delivery: Contact - Hands-on field activities, field trips and excursion		
Assessment modes: Practical and field trip reports		

NAS.2.5 AGRIC. – AGRONOMY AND HORTICULTURE SCIENCE

Module code: CSPM211	Semester 1	NQF LEVEL 6 CREDITS 16
Title: Introduction to Soil Science		
<p>Module outcomes: Students will be able to demonstrate an understanding of soil as a natural entity for sustainable agriculture. They will gain insight into the genesis, physics, chemistry, biology and microbiology of soils. Basic knowledge of how these soil properties interact to affect soil quality for different purposes will be gained. It is anticipated that students at the end of the module will have the skills and ability to perform basic tests aimed at assessing soil fertility. They will be able to appreciate soils as a natural resource for South Africa and for the world. Students will therefore develop an understanding of the role that soils play in the agricultural and economic situation in South Africa and the world.</p>		
<p>Method of delivery: Contact - lectures</p>		
<p>Assessment modes: Formal class tests, practical/Field reports, assignments, final 3 hr written examination paper</p>		
Module code: CSPM212	Semester 1	NQF LEVEL 6 CREDITS 12
Title: Agricultural Climatology		
<p>Module outcomes: Ability to summarize and interpret weather data. Ability to identify the climate variables that may affect agricultural productivity. Learners will have skills needed to read and measure weather data. Ability to predict effects of man's activities on climate change.</p>		
<p>Method of delivery: Contact - Lectures</p>		
<p>Assessment modes: Tests, assignments ,practical assessments and examination</p>		
Module code: CSPM213	Semester 1	NQF LEVEL 6 CREDITS 8
Title: Farm Machinery		
<p>Module outcomes: Ability to take proper care of farm machinery and implements. Ability to use farm implements and machinery properly. Ability to do budgeting of farm operations. An understanding of how farm buildings are constructed and the budgeting for construction of farm buildings. Ability to produce simple designs of farm buildings.</p>		
<p>Method of delivery: Contact - Lectures</p>		
<p>Assessment modes: Tests, assignments ,practical assessments and examination</p>		
Module code: CSPM221	Semester 2	NQF LEVEL 6 CREDITS 16
Title: Introduction to Crop Production		
<p>Module outcomes: Learners will be able to understand climatic factors on crop production. They will be able to gain knowledge on organic farming and quality in crop products. They will be able to understand the different management practices on crop production such as tillage, rotation, intercropping and conservation agriculture.</p>		
<p>Method of delivery: Contact – teaching, provision of lecture notes through powerpoint presentation slides and assignment topics are pasted on efundi.</p>		
<p>Assessment modes: Assessment is through tests, assignments, practical reports and examination.</p>		

Module code: CSPM222	Semester 2	NQF LEVEL 6 CREDITS 16
Title: Soil fertility and fertilizers		
Module outcomes: Students will be able to demonstrate a good knowledge of how soil conditions (such as soil texture, soil pH, clay mineralogy and cation exchange capacity) affect plant growth and suggest possible management practices to increase crop yield. Students will gain knowledge of the 17 essential elements required for plant growth in regards to factors which affect nutrient availability in soils. Students will be able to evaluate the fertility status of soils and make subsequent fertilizer recommendations.		
Method of delivery: Contact – teaching, powerpoint presentations, excursions to complement teaching		
Assessment modes: Tests, assignments ,practical reports and examination		
Module code: CSPM223	Semester 2	NQF LEVEL 6 CREDITS 12
Title: Soil Conservation		
Module outcomes: Learners will be able to describe various types of land degradation and how they are caused, as well as identify and assess different stages and forms of soil degradation. They will also have an understanding of how different soil management practices affect soil quality and the role that these have on agricultural productivity. Knowledge of the effect of agricultural activities on soil degradation and vice versa will also be gained. Learners at the end of the module will be able to identify and describe different strategies and management techniques used in controlling soil degradation.		
Method of delivery: Contact – teaching, provision of lecture notes through powerpoint presentation slides and assignment topics are pasted on efundi.		
Assessment modes: Assessment is through tests, assignments, examination, practical reports and examination.		
Module code: CSPM225	Semester 2	NQF LEVEL 6 CREDITS 12
Title: Agricultural Microbiology		
Module outcomes: The learners will be able to identify and describe microorganisms that commonly present in soils, plants and animals. They will have the ability to differentiate beneficial and pathogenic microorganisms in agriculture, and have an understanding of the role that both beneficial and pathogenic microorganisms play in agricultural productivity. Learners will also be equipped with knowledge of the role of these microorganisms in nutrient cycling in agriculture and how to control the dissemination of microorganisms that are pathogenic to plants and animals.		
Method of delivery: Contact - Lectures		
Assessment modes: Formal class tests, practical/Field reports, assignments		
Module code: CSPM311	Semester 1	NQF LEVEL 7 CREDITS 8
Title: Agronomy Summer Crops		
Module outcomes: For each prescribed summer crop, learners will be able: To know its origin, economic importance distribution, and morphology. To know its climatic and soil requirements and its appropriate cultural practices. To know its fertilizer requirements. To know its fertilizer requirements. To know current challenges and topical issues in the production of the crop and related areas of research focus.		
Method of delivery: Contact – teaching, provision of lecture notes through powerpoint presentation slides and assignment topics are pasted on efundi.		

Assessment modes: Assessment is through tests, assignments, practical reports and examination.		
Module code: CSPM313	Semester 1	NQF LEVEL 7 CREDITS 16
Title: Vegetable Production		
Module outcomes: Learners will be able to understand the importance and classification of vegetables and also the vegetable industries. They will also gain knowledge on different methods of vegetable propagations. Aspects of vegetable production such as hydroponics and transplanting will be covered. Student will gain knowledge on different production methods of selected vegetables.		
Method of delivery: Contact – teaching, provision of lecture notes through powerpoint presentation slides and assignment topics are pasted on efunDi.		
Assessment modes: Assessment is through tests, assignments, practical reports and examination.		
Module code: CSPM 17	Semester 1	NQF LEVEL 7 CREDITS 8
Title: Plant Pathology and Nematology		
Module outcomes: Ability to carry out disease field and laboratory diagnosis of plant diseases and parasitic nematodes for the commonly cultivated field and horticultural crops. Student should also be able to identify the non-pathogenic plant diseases. Comprehend the plant diseases infection processes and development of both polycyclic and monocyclic diseases of various crops (Fungal, viral and bacterial diseases). Ability to comprehend and interpret research data and literature on plant pathology and nematology. Understand and interpret legislation governing control of diseases and nematodes e.g. Quarantine/Phyosanitary control regulations. Advise the farming community on how to prevent or control plant diseases and nematodes.		
Method of delivery: Contact - Lectures		
Assessment modes: Formal class tests, practical/Field reports, assignments		
Module code: CSPM319	Semester 1	NQF LEVEL 7 CREDITS 8
Title: Agricultural Entomology		
Module outcomes: Ability to carry out field and laboratory identification of pests (arthropods, insects & vertebrates) for the commonly cultivated field and horticultural crops. Comprehend the biology and life cycle of arthropods and insect pests of different orders (Orthoptera, Hemiptera, Homoptera, Diptera). Ability to comprehend and interpret research data and literature on agricultural pests. Understand and interpret legislation governing control of pests e.g. Quarantine/Phyosanitary control regulations. Advise the farming community on how to prevent or control agricultural pests including understanding of regional/international regulations on the management and control of migratory pests such Red locust, Fall armyworm and African armyworm		
Method of delivery: Contact - Lectures		
Assessment modes: Formal class tests, practical/Field reports, assignments		
Module code: CSPM321	Semester 2	NQF LEVEL 7 CREDITS 8
Title: Agromony of Winter Crops		
Module outcomes: For each prescribed winter crop, learners will be able: To know its origin, economic importance distribution, and morphology. To know its climatic and soil requirements. To		

know its appropriate cultural practices. To know current challenges and topical issues in the production of the crop and research focus in addressing challenges.

Method of delivery:

Contact – teaching, provision of lecture notes through powerpoint presentation slides and assignment topics are pasted on efunDi.

Assessment modes:

Assessment is through tests, assignments, practical reports and examination.

Module code: CSPM322	Semester 2	NQF LEVEL 7 CREDITS 16
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Title: **Weeds and Weed Control**

Module outcomes:

Learners should have an in-depth understanding of the biology of agricultural weeds. Learners should also be able to identify weed species for water bodies, and ethnobotany. Furthermore, they should be able to identify weed species. Able to come up with appropriate weed control measures. Learners should have scientific knowledge in the use of herbicides, i.e. modes of action and metabolism. Other non-chemical methods of weed control measures should be covered. Importantly they should be able to comprehend and interpret literature related to weed control. Supervise and guide farmers how to control weeds. Introduce to farmers new technology of weed control.

Method of delivery:

Contact - Lectures

Assessment modes:

Formal class tests, practical/Field reports, assignments

Module code: CSPM323	Semester 2	NQF LEVEL 7 CREDITS 16
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Title: **Fruits Production**

Module outcomes:

Ability to select appropriate fruit crops for specific area. Apply theoretical and practical knowledge in establishment and management of orchards and vineyards giving particular attention to the following: propagation techniques, pruning and training, processing and marketing of fruit produce.

Method of delivery:

Contact - Lectures

Assessment modes:

Formal class tests, practical/Field reports, assignments

Module code: CSPM324	Semester 2	NQF LEVEL 7 CREDITS 16
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Title: **Principles of Irrigation**

Module outcomes:

Learners will know the basic concepts, tools, and skills used to deliver water efficiently and effectively on both a field and garden scale. They will also have the ability to identify the most efficient irrigation system to use under various circumstances because they will have an understanding of the movement and cycling of water in agricultural systems, and the environmental factors that influence the type, frequency, and duration of irrigation. Learners will be able to calculate the water requirement for irrigation, and specify for determinants of irrigation scheduling based on available irrigation system. They will be able to conduct a simple evaluation of an existing irrigation system.

Method of delivery:

Contact - Lectures, powerpoint presentations, video shows, group task presentation

Assessment modes:

Formal class tests, practical/Field reports, assignments

Module code: CSPM325	Semester 2	NQF LEVEL 7 CREDITS 8
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Title: **Plant Physiology**

Module outcomes:

At the end of the module learners are expected: to be able to outline the importance of crop-soil-water relations; to explain the physiology and the role of mineral nutrients in

plants; to outline the nitrogen, carbon, phosphorus and other major biogeochemical cycles; to explain photosynthetic processes and the different types of photosynthetic pathways; to explain water potential and outline the translocation process. Learners should be able to explain the significance of plant hormones in crop production as well as be able to explain dormancy and its significance in crop plants.

Method of delivery:

Contact - lectures, discussions, seminars, PowerPoint

Assessment modes

Formative: – assignments, class tests, quizzes, practicals, term papers

Summative: – final end of semester examination

Module code: CSPM326	Semester 1	NQF LEVEL 7 CREDITS 8
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Title: **Principles of Genetics & Plant Breeding**

Module outcomes:

At the end of this module learners should be able to: explain the concept of plant breeding; demonstrate understanding of genetics as the basis of plant breeding; apply Mendel's principles of inheritance in plant breeding; discuss the reproductive systems in plants and their importance/significance in breeding; describe the DNA structure and its importance as a modern tool in plant breeding; discuss the impact of genetic engineering in society with reference to GMOs.

Method of delivery:

Contact - lectures, discussions, seminars, PowerPoint

Assessment modes

Assignments, class tests, quizzes, practicals, term papers, final end of semester examination

Module code: CSPM327	Semester 2	NQF LEVEL 7 CREDITS 8
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Title: **Soil Survey & Land Use Planning**

Module outcomes:

Upon completion of this module learners will be familiar with and describe the different kinds of soil survey, utilize the knowledge of remote sensing and other soil information systems (i.e. soil physical, chemical, vegetation and geologic) to generate soil map, ability to undertake soil evaluation by utilizing soil maps for land use planning purposes, describe and apply the knowledge of precision agriculture and concept of management zones.

Method of delivery:

Contact – Lectures and powerpoint presentations, video shows, assign project

Assessment modes:

Formal class tests, reports of project & practicals and assignments

Module code: CSPM411	Semester 1	NQF LEVEL 8 CREDITS 8
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Title: **Crop Production Systems**

Module outcomes:

To give learners a global overview of different crop production systems. Learners will be able to know sustainable crop production. They will gain knowledge on organic farming and categories of different farming systems. Learners will be able to understand different cropping systems. To know the advantages and disadvantages associated with each of the two major crop production systems. To be able to analyse and interpret results from multiple cropping systems. To be able to know how to assess yield advantages from multiple cropping systems.

Method of delivery:

Contact – teaching, provision of lecture notes through powerpoint presentation slides and assignment topics are posted on efunedi.

Assessment modes:

Assessment is through tests, assignments, practical reports and examination.

Module code: CSPM419	Semester 1	NQF LEVEL 8 CREDITS 12
Title: Soil Chemistry & Mineralogy		
Module outcomes:		
<p>Upon completion of the module, it is expected that learners will be able to: demonstrate knowledge of the 3-phase soil system as the basis for explaining reaction processes of soil for fertility management, explain and predict the various layer silicates that may be formed in soils using the knowledge of mineral stability diagrams, understand knowledge of mineral solution chemistry including thermodynamic principles in soil system and apply these to explain availability of essential elements to crops, demonstrate knowledge of exchange processes in relation to plant nutrient availability and uptake, and explain soil reaction in relation to soil fertility constraints with emphasis on soil acidity and alkalinity, and their management.</p>		
Method of delivery:		
Contact - Lectures, powerpoint presentations, assigned project		
Assessment modes:		
Formal class tests, reports of practicals & assigned project, assignments		
Module code: CSPM415	Semester 1	NQF LEVEL 8 CREDITS 16
Title: Pedology and Soil Classification		
Module outcomes:		
<p>Students will understand soil formation with regards to chemical & physical weathering and the soil pedogenic processes. Students will appreciate and understand the relationship between the factors of soil formation and soil formation in different environments. They will be able to describe various soil profiles and determine the environment of formation of each. They will be able to utilize soil field, laboratory, and environmental data to classify soils using different soil classification systems including the South African soil classification system.</p>		
Method of delivery:		
Contact - Lectures		
Assessment modes:		
Formal class tests, reports of practicals and assignments		
Module code: CSPM416	Semester 1	NQF LEVEL 8 CREDITS 8
Title: Soil Physics		
Module outcomes:		
<p>Learners will be able to appreciate the role of the three phases of soil in agriculture and the constraints that they present in plant growth. They will know the basic concepts of transport and retention of water and solutes in the soil and comprehend transfer processes for water, air, solutes, and heat in soils. They will be able to perform laboratory and field experiments to measure selected physical properties of soils that affect soil water flow including the transport of heat, air and agrochemicals in soils. They will also be able to apply the principles governing the flow and retention of water and solutes in the root zone to solve practical problems relating to general water management of soil-water-systems used in agriculture.</p>		
Method of delivery:		
Contact - Lectures, powerpoint presentations, video shows, group task presentation		
Assessment modes:		
Formal class tests, practical/Field reports, assignments		
Module code: CSPM421	Semester 2	NQF LEVEL 8 CREDITS 16
Title: Crop Physiology		
Module outcomes:		
<p>At the end of the module learners will be able: to relate crop growth analysis to practical field crop production; to explain the physiological basis of crop yield; to be able to demonstrate an understanding source-sink relationships; to apply their knowledge of plant hormones to crop production; to apply their knowledge of the physiology of</p>		

<p>mineral nutrition to better manage crop nutrition.</p> <p>Method of delivery: Contact, lectures, discussions, seminars, PowerPoint</p> <p>Assessment modes Formative : – assignments, class tests, quizzes, practicals, term papers Summative: – final end of semester examination</p>		
Module code: CSPM425	Semester 2	NQF LEVEL 8 CREDITS 12
Title: Applied Crop Protection		
<p>Module outcomes: Ability to understand and apply scientific principles in practical crop protection to cover the following: Entomology, Plant Pathology and Nematology. Should have understanding of Principles of Integrated Pest Management Programme. Under Entomology the Learners should have an in-depth knowledge of insect pest classification focusing on the following important Genera: Hymenoptera, Coleoptera, and Lepidoptera. Under Plant Pathology the Learners should be knowledgeable in Plant Bacteriology, Mycology and Virology, that is, etiology and epidemiology of the major plant diseases of economic importance. The Learners should also have basic understanding of Nematology. In general the Learners should also demonstrate critical and creative thinking in research and development in areas of crop protection.</p> <p>Method of delivery: Contact - Lectures</p> <p>Assessment modes: Formal class tests, practical/Field reports, assignments</p>		
Module code: CSPM426	Semester 2	NQF LEVEL 8 CREDITS 12
Title: Soil Microbiology		
<p>Module outcomes: Learners will be able to classify microorganisms in the soil, and appreciate the soil properties that favour the survival of the vast number and variety of microorganisms that inhabit the soil. They will also have the ability to determine how different soil management techniques affect the diversity and population of microorganisms in the soil. Learners will be able to conduct measurements in soil microbiology, and apply microbiological technology to improve crop production.</p> <p>Method of delivery: Contact – Lectures and powerpoint presentations</p> <p>Assessment modes: Formal class tests, reports of practicals and assignments</p>		
Module code: CSPM479	Semester 2	NQF LEVEL 8 CREDITS 12
Title: Practical Crop Production Training		
<p>Module outcomes: Ability to layout field trials. Ability to operate farm machinery properly. Ability to calibrate implements properly system Ability to weigh and apply fertilizers properly. Ability to classify soils at a particular site. Ability to calculate yield and plant population estimates.</p> <p>Method of delivery: Contact - Hands-on field activities, field trips and excursion</p> <p>Assessment modes Practical reports</p>		
Module code: CSPM474	Semester 2	NQF LEVEL 8 CREDITS 32
Title: Research Project and Seminar		
<p>Module outcomes: Learners will be able to conceptualize, prepare and submit research project proposal; conduct a critical review of literature review on identified research topic, critique relevant aspects of the literature, synthesize information generated and relate to own study; and present proposal at a departmental review forum for assessment, comply with the</p>		

relevant NWU research ethics, successfully undertake the research project upon review as recommended during the presentation, collect and collate all data, and subject the data generated into useful and appropriate statistical analysis for interpretation; and draw useful inferences, and carefully document the findings in the form of a research report in an approved format.

Method of delivery:

Contact – teaching on research methodology, prepare and submit draft research proposal and presentation, supervision of execution of proposed research, data collection, presentation of results of data collection and writing of final report

Assessment modes:

Assessment of oral presentations (research proposal and results/findings), and submitted final research report.

Module code: CSMP411	Semester 1	NQF LEVEL 8 CREDITS 16
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Title: **Advanced Plant Breeding**

Module outcomes:

At the end of this module, students should be able to: develop well defined breeding objectives; plan a plant breeding programme; demonstrate understanding of conventional and unconventional plant breeding methods for self- and cross-pollinated crops; demonstrate understanding of breeding methods for selected crops; explain the concepts of classical quantitative genetics in breeding programmes; be able to demonstrate practical skills in pollinating plants; demonstrate understanding and application of molecular breeding techniques; articulate on the societal issues with regard to GMOs

Method of delivery:

Contact - lectures, discussions, seminars and PowerPoint

Assessment modes

Formative – assignments, class tests, quizzes, practical, term papers

Summative – final end of semester examination

Module code: CSMP412	Semester 1	NQF LEVEL 8 CREDITS 12
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Title: **Horticultural Science**

Module outcomes:

Learners will be able to understand the effect of climate on horticultural production. Demonstrate the ability to comprehend scientific literature related to horticultural production. Learners should also have understanding and practical skills/exposure in scientific propagation techniques such as use of tissue culture, hydroponics in horticulture. Learners will be equipped with mushroom production technology. Conduct projects to demonstrate ability of project management. Be able to add value to horticultural produce in RSA.

Method of delivery: Contact - Lectures

Assessment modes:

Formal class tests, practical/Field reports, assignments

Module code: CSSS423 (change to CSPM327)	Semester 2	NQF LEVEL 8 CREDITS 8
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Title: **Soil Survey & Land Use Planning**

Module outcomes:

Upon completion of this module learners will be familiar with and describe the different kinds of soil survey, utilize the knowledge of remote sensing and other soil information systems (i.e. soil physical, chemical, vegetation and geologic) to generate soil map, ability to undertake soil evaluation by utilizing soil maps for land use planning purposes, describe and apply the knowledge of precision agriculture and concept of management zones.

Method of delivery:

Contact – Lectures and powerpoint presentations, video shows, assign project

Assessment modes: Formal class tests, reports of project & practicals and assignments

NAS.2.6 AGRICULTURAL ECONOMICS

Module code: AEDM111	Semester 1	NQF LEVEL 5 CREDITS 12
Title: Introduction to Agricultural Economics		
Module outcomes: To provide an understanding of the main economic issues, concepts and tools of agricultural economics. Equip learners by developing an understanding of solving basic economic problems, outlining the potential solutions to those problems and describing the major types of economic system.		
Module code: AEDM314	Semester 1	NQF LEVEL 7 CREDITS 8
Title: Farm Management and Accounting		
Module outcomes: To able to demonstrate understanding of farm management functions,Apply farm management principles and perform farm management and farm accounting tasks, Demonstrate understanding of financial planning, analysis and control in farming,apply and analyze financial planning and control tasks in farming environment.		
Module code: AECM111	Semester 1	NQF LEVEL 5 CREDITS 12
Title: Introduction to Agricultural Economics		
Module Outcomes: To provide a sound understanding of the basic economic relationship amongst household, firms, government and to provide solutions to global economic challenges. Interpret and analyse tables (demand, supply schedules etc) and graphs in agricultural economics.Manage and handle economic data and tasks.		
Module code: AECM223	Semester 2	NQF LEVEL 6 CR3EDITS 8
Title: Farm Accounting		
Module Outcomes: To be able to demonstrate an understanding the importance and the use of farm accounting for farm management,to make use of records and accounts as a tool of farm management and to understand and apply important depreciation and tax decisions.		
Module code: AECM311	Semester 1	NQF LEVEL 7 CREDITS 16
Title: Agricultural Micro - Economics		
Module outcomes: To have knowledge and demonstration of understanding of relevant terms, rules, concepts, principles and theories to describe microeconomics and be able to apply these knowledge and principles in the real world situations. Conduct economic analysis in agricultural and related enterprises.Advise agricultural stakeholders on micro-economics matters.		
Module code: AECM312	Semester 1	NQF LEVEL 7 CREDITS 8
Title: International Agrrcultural Trades		
Module outcomes: To have knowledge and demonstration of understanding of relevant terms, rules, concepts, principles and theories to describe international agricultural trade and be able to apply these knowledge and principles in the real world situations.		
Module code: AECM313	Semester 1	NQF LEVEL 7 CREDITS 16
Title: Agricultural Statistics for Research I		
Module outcomes: To be able to use application of linear regression and general linear model to economic data,use and interpretation of at least two econometric software for data analysis.Discuss the problems of estimation when classical assumption of linear regression are violated and application of Chi-square analysis, estimation of Index numbers and time series analysis in the agricultural sector.		

Module code: AECM314	Semester 1	NQF LEVEL 7 CREDITS 8
Title: Farm Management and Accounting		
Module outcomes: To able to demonstrate understanding of farm management functions,Apply farm management principles and perform farm management and farm accounting tasks, Demonstrate understanding of financial planning, analysis and control in farming,apply and analyze financial planning and control tasks in farming environment.		
Module code: AECM315	Semester 1	NQF LEVEL 7 CREDITS 8
Title: Food Security Analysis		
Module outcomes: To able to demonstrate an understanding of the meaning and concepts of food Security, analyse and identify the indicators of food security, discuss the influence household types and food security, describe food security situation in terms of South African agricultural policy and explain the determinants of food security.		
Module code: AECM316	Semester 1	NQF LEVEL 7 CREDITS 16
Title: Agricultural Production Economics		
Module outcomes: To able to to optimize the objective function of farming community or the nation within a framework of limited resources,to provide guidance to individual farmers in using their resources in most efficient way and facilitate the most efficient use of resources from economic point of view.		
Module code: AECM321	Semester 2	NQF LEVEL 7 CREDITS 16
Title: Land Resource and Environmental Economics		
Module outcomes: To able to demonstrate an understanding of theories of land resource economics and the framework of land resource management, Application of economic tools to resources use and environmental issues,discuss the interrelationship between environment, economic growth and public policy on environmental issues and qualityand discuss environmental problems in South Africa.		
Module code: AECM322	Semester 2	NQF LEVEL 7 CREDITS 16
Title: Agricultural Production Economics		
Module outcomes: To able to optimize the objective function of a farming community or a nation within a framework of limited resources. Students will be able to provide guidance to individual farmers in using their resources in most efficient way and facilitate the most efficient use of resources from economic point of view.		
Module code: AECM323	Semester 2	NQF LEVEL 7 CREDITS 8
Title: Agricultural Marketing		
Module outcomes: To able to demonstrate understanding of the principles of agricultural marketing and price analysis. Students be able to apply agricultural marketing and risk management principles. Students will be able to understand the role of agricultural marketing and risk management in South Africa and wide variety of settings.		
Module code: AECM325	Semester 2	NQF LEVEL 7 CREDITS 8
Title: Agricultural Macro- Economics		
Module outcomes: To able to show knowledge and demonstration of understanding of relevant terms, rules, concepts, principles and theories to describe macroeconomics and be able to apply these knowledge and principles in the real world situations. Be able to advise agricultural		

stakeholders, i.e. organized agriculture, government, NGOs etc., on macro-economic matters.		
Module code: AECM326	Semester 2	NQF LEVEL 7 CREDITS 8
Title: Agricultural Finance		
Module outcomes:		
To able to apply financial principles to the farming environment and be familiar with numerous management functions, regardless of the size of the farm business. To learn about and apply the basic concepts and practices of modern agricultural finance principles as they are used in a wide variety of settings. Use the techniques of financial and economic analysis to assess economic viability and loan repayment ability of a farm.		
Module code: AECM327	Semester 2	NQF LEVEL 7 CREDITS 8
Title: International Agricultural Trade		
Module outcomes:		
To have knowledge and demonstration of understanding of relevant terms, rules, concepts, Principles and theories to describe international agricultural trade and be able to apply these knowledge and Principles in the real world situations.		
Module Code: AECM411	Semester 1	NQF LEVEL 8 CREDITS 8
Title: Agricultural Project Appraisals and Management		
Module outcomes:		
To able to be an efficient, competent agricultural project manager, who understands project appraisal and management principles and can use the knowledge acquired practically. Contribute towards improvement of project appraisal and management locally and nationally and be able to function within a group for mutual support, sustenance to peers for professional growth and development.		
Module Code: AECM412	Semester 1	NQF LEVEL 8 CREDITS 16
Title: Research project and seminar I		
Demonstrate knowledge and understanding of: Research problems creation and identification in agricultural economics:		
<ul style="list-style-type: none"> • formulation of research questions and objectives, • description of research population and application of research sampling procedures • identification appropriate data collection instruments and procedures • evaluation and application of correct data analysis techniques • generation and analysis of a bankable research proposal 		
Module Code: AECM413	Semester 1	NQF LEVEL 8 CREDITS 16
Title: Quantitative Methods in Agricultural Economics		
Module Outcomes:		
To be able to understand and apply basic mathematical methods that are essential for adequate economic analysis and proper understanding of the current economic literature.		
Module Code: AECM414	Semester 1	NQF LEVEL 8 CREDITS 16
Title: Agricultural Statistics for Research II		
Module Outcomes:		
Estimation of simultaneous equation models, describe the properties of stochastic and linear time series and estimate regression models including dummy variables and dummy dependent models including the application of single equation models		

Module Code : AECM415	Semester 1	NQF LEVEL 8 CREDITS 16
Title: Agribusiness Management		
Module Outcomes: To be able to apply production, financial, marketing, human resource and risk management principles to the three sectors of agribusiness environment and a wide variety of agricultural related business settings.		
Module Code: AECM421	Semester 2	NQF LEVEL 8 CREDITS 8
Title: Farm Planning and Linear Programming		
Module Outcomes: To be able to use linear programming and other operations research methods/models in solving allocative and decision problems of agriculture such as what to produce, how much to produce, and the most profitable enterprise combinations, costs reduction and general optimization of resource usage.		
Module code: AECM422	Semester 2	NQF LEVEL 8 CREDITS 16
Title: Agricultural Policy Analysis		
Module outcomes: To able to apply agricultural policy principles to the farming environment and a wide variety of farm business settings for efficient and effective agricultural projects and programme implementation.		
Module code: AECM424	Semester 2	NQF LEVEL 8 CREDITS 8
Title: Agriculture and Economic Development		
Module outcomes: To able to understand the economic problems of agriculture in developing communities/countries. Students will be able to analyse agriculture's role in the development of underdeveloped communities/countries; identify barriers to agricultural development and to examine critically remedial agricultural policies and well-known tools of economic analysis to foster more rapid development. Thus be able to apply agricultural policy principles to the farming environment and a wide variety of farm business settings for efficient and effective agricultural projects and programme implementation, demonstrate very good understanding of principles of technical, allocative, scale and economic efficiencies.		

NAS.2.6.1 AGRICULTURAL EXTENSION

Module code: AXDM211	Semester 1	NQF LEVEL 6 CREDITS 16
Title: Fundamentals of Agricultural Extension		
Module outcomes: To develop an understanding of the concepts of agricultural extension and its environment and demonstrate an understanding of the principles of Agricultural Extension, demonstrate an understanding of basic social - cultural and psychological concepts in agricultural extension and communication process in agricultural extension, understanding of extension program planning, management and evaluation concepts.		
Module code: AXDM311	Semester 1	NQF LEVEL 7 CREDITS 8
Title: Agricultural Extension for Development		
Module outcomes: To able to demonstrate understanding of the role of extension in development, teaching and learning process in agricultural extension and the use of different extension teaching methods.		

Module code: AEXM211	Semester 1	NQF LEVEL 6 CREDITS 16
Title: Fundamentals of Agricultural Extension		
Module outcomes: To able to demonstrate understanding of principles of Agricultural Extension, identify challenges of agricultural extension, demonstrate an understanding of the process and elements of communication process, identify different extension teaching methods and understanding of extension program planning and management concepts.		
Module code: AEXM212	Semester 1	NQF LEVEL 6 CREDITS 8
Title: Communication and Agricultural Technology Transfer		
Module outcomes: To able to describe the processes of communication ,analyze the communication process in relation to extension service delivery and describe different technology transfer models,explain technology transfer processes and highlight the synergy of technology transfer processes and models.		
Module code: AEXM222	Semester 2	NQF LEVEL 6 CREDITS 8
Title: Agricultural Extension for Development		
Module outcomes: To able to demonstrate an understanding of the role of extension in the development process and an understanding of the teaching and learning process in agricultural extension, the use of different extension teaching methods and identify, develop an extension program for development purposes.		
Module code: AEXM324	Semester 2	NQF LEVEL 7 CREDITS 8
Title: Agricultural Rural Sociology		
Module outcomes: To able to demonstrate and understanding of the meaning, nature and scope of rural sociology,theories of social change,organization of societies and problems of cultural and directed change,definition of diffusion and adoption and processes of diffusion and adoption,adopter categories and diffusion curves.		

NAS.2.7 MODULE OUTCOME EXTENDED VAAL

Module code: ACFS111	Semester 1	NQF level: 5
Title: Financial Accounting Special: Basic Concepts, Accounting Cycle and Accounting Systems / <i>Finansiële Rekeningkunde Spesiaal: Basiese Konsepte, Rekeningkundige Siklus en Rekeningkundige Stelsels</i>		
Module outcomes /Module uitkomst:		
<p>On completion of the module the student should be able to demonstrate:</p> <ul style="list-style-type: none"> • Basic knowledge of the elementary transactions of the accounting cycle; • The ability to gather information from source documents and communicate financial information reliably, accurate and coherently when preparing a set of basic financial statements; and • Acceptable behaviour within the academic environment, inclusive of adherence to rules on plagiarism and copyright principles. <p><i>Na voltooiing van die module behoort die student in staat te wees om die volgende te demonstree:</i></p> <ul style="list-style-type: none"> • 'n basiese kennis van die elementêre transaksies van die rekeningkundige siklus; • die vermoë om inligting vanaf brondokumente in te samel en finansiële inligting betroubaar, akkuraat en samehangend te kommunikeer by die voorbereiding van 'n stel basiese finansiële state; en • aanvaarbare gedrag binne die akademiese omgewing, insluitende die nakoming van reëls oor plagiaat en kopiereg. 		
<p>Method of delivery: Full-time <i>Metode van aflewering: Voltyds</i></p>		
<p>Assessment plan: The participation mark is calculated using formal formative assessment activities that could include, but might not be limited to the following:</p> <p>Class tests, principle tests, assignments, e-assignments/quizzes (utilising the e-learning platform of NWU) and scheduled tests. The weightings will be communicated to students in a module overview document. A participation mark of 35% allows a student admission to the final examination (summative assessment). Additional proof of participation requirements may also be set out in the module study guide, which must also be satisfied before exam admission is allowed.</p> <p>The final module mark is calculated using the following weightings: Participation mark (50%); and Final examination mark (50%).</p> <p>The examination sub-minimum requirement is 40%.</p> <p>Assesseringsplan: Die deelnamepunte word bereken deur gebruik te maak van formele formatiewe assesseringsaktiwiteite wat die volgende kan insluit, maar nie noodwendig daartoe beperk is nie: <i>Klastoetse, beginseltoetse, opdragte, e-opdragte/vasvrae (deur middel van die NWU se e-leer platform), geskeduleerde toetse en 'n halfjaar-eksamen.</i> <i>Die gewigte sal in 'n module-oorsigdokument aan studente gekommunikeer word.</i> <i>'n Deelnamepunt van 40% sal 'n student toegang tot die finale eksamen bied (summative assessering). Bykomende bewys-van-deelname-vereistes mag in die module se studiegids uiteengesit word, wat ook bevredig moet word voordat eksamentoeelating verleen word.</i> <i>Die finale modulepunt word bereken deur die volgende gewigte te gebruik:</i> <i>Deelnamepunte (50%); en</i> <i>Finale eksamenpunt (50%).</i> <i>Die subminimumvereiste vir die eksamen is 40%.</i></p>		

Module code: ACFS121	Semester 2	NQF level: 5
Title: Financial Accounting Special: Bank Reconciliation, Elementary Financial Reporting ,Analysis and Interpretation of Financial Statements / Finansiële Rekeningkunde Spesiaal: Bankrekonsiliasie, Elementêre Finansiële Verslagdoening, Elementêre Ontleding en Vertolking van Finansiële State		
Module outcomes: On completion of the module the student should be able to demonstrate: <ul style="list-style-type: none"> • A basic knowledge of different entity forms; • The ability to communicate financial information reliably, accurately and coherently when preparing a set of financial statements; • The ability to analyse and interpret a set of financial statements; and • Acceptable behaviour within the academic environment, inclusive of adherence to rules on plagiarism and copyright principles. 		
Module-uitkomst: <i>Na voltooiing van die module behoort die student in staat te wees om die volgende te demonstreer:</i> <ul style="list-style-type: none"> • 'n basiese kennis van die elementêre transaksies van die rekeningkundige siklus; • die vermoë om inligting vanaf brondokumente in te samel en finansiële inligting betroubaar, akkuraat en samehangend te kommunikeer by die voorbereiding van 'n stel basiese finansiële state; en • aanvaarbare gedrag binne die akademiese omgewing, insluitende die nakoming van reëls oor plagiaat en kopiereg. 		
Method of delivery: Full-time <i>Metode van aflewering: Voltyds</i>		
Assessment plan: The participation mark is calculated using formal formative assessment activities that could include, but might not be limited to the following: Class tests, principle tests, assignments, e-assignments/quizzes (utilising the e-learning platform of NWU) and scheduled tests. The weightings will be communicated to students in a module overview document .A participation mark of 40% allows a student admission to the final examination (summative assessment). Additional proof of participation requirements may also be set out in the module study guide, which must also be satisfied before exam admission is allowed. The final module mark is calculated using the following weightings: Participation mark (50%); and Final examination mark (50%). The examination sub-minimum requirement is 40%. <i>Assesseringsplan: Die deelnamepunte word bereken deur gebruik te maak van formele formatiewe assesseringsaktiwiteite wat die volgende kan insluit, maar nie noodwendig daartoe beperk is nie:</i> <i>Klastoetse, beginseltoetse, opdragte, e-opdragte/vasvrae (deur middel van die NWU se e-leer platform), geskeduleerde toetse en 'n halfjaar-eksamen. Die gewigte sal in 'n module-oorsigdokument aan studente gekommunikeer word.</i> <i>'n Deelnamepunt van 40% sal 'n student toegang tot die finale eksamen bied (summatiewe assessering). Bykomende bewys-van-deelname-vereistes mag in die module se studiegids uiteengesit word, wat ook bevredig moet word voordat eksamentoelating verleen word. Die finale modulepunt word bereken deur die volgende gewigte te gebruik:</i> <i>Deelnamepunte (50%); en</i> <i>Finale eksamenpunt (50%).</i>		

Die subminimumvereiste vir die eksamen is 40%.

ACFS111,121 (Financial Accounting Special) are preparatory for the regular first level modules in Accounting. It is intended for students who have not taken accounting at grade 12 level.

ACFS111,121 (Finansiële Rekeningkunde Spesiaal) is ter voorbereiding vir die gewone eerstevlak modules in Rekeningkunde. Dit word bedoel vir studente wat nie Rekeningkunde op graad 12 vlak geneem het nie

Module code: ITSP111

Semester 1

NQF level: 5

Title: Introduction to Problem Solving / Inleiding tot Probleemoplossing

Module outcomes:

On completion of the module the student should be able to:

- explain the difference between solving problems and writing computer programming language code;
- understand what problems are and that they have several possible solutions;
- apply a strategy to help understand, solve, and evaluate the solution to a problem;
- write solutions to problems in a semi-formal structured English (pseudo-code);
- recognize the role of sequence, choice (selection), and repetition (iteration) in solving problems;
- understand the importance of the role of abstraction in problem solving;
- identify the variables (data items) needed in a problem solution (algorithm);
- estimate likely ranges of variables;
- apply the problem solving strategy to real-world problems involving variables and nested action blocks;
- understand the ways in which different kinds (types) of data affect the way solutions to problems are designed;
- recognize appropriate operations that can be carried out on different data types;
- identify different ways of carrying out selection and iteration and understand how different specialized control constructs can be used appropriately;
- understand the difference between simple and compound selections, and how complex conditions can be expressed to control the selections;
- understand the difference between determinate and indeterminate iterations and how complex conditions can be expressed to control the iterations;
- determinate: count-controlled iteration;
- indeterminate: zero-or-more and at-least-once iterations;

Analyse real-world problems to identify the appropriate selection and iteration constructs to use

Module-uitkomst:

Na voltooiing van die module behoort die student in staat te wees om:

- *te verduidelik wat die verskil is tussen probleemoplossing en die skryf van rekenaar programme in programmeertaal;*
- *te verstaan wat probleme is en dat probleme meer as een oplossing het;*
- *'n strategie toe te pas vir die verstaan, oplos en evaluering van 'n oplossing van 'n probleem;*
- *oplossings te skryf vir probleme in 'n semi-formele gestruktureerde Engels (pseudo kode);*
- *die rol van volgorde, keuse (seleksie) en herhaling in probleemoplossing te herken;*
- *probleemoplossing-strategie toe te pas op werklike probleme, insluitend alternatiewe rigtings van aksie en herhalende stappe van aksie;*
- *die belangrikheid wat die rol van abstraksie speel in probleemoplossing te verstaan;*

<ul style="list-style-type: none"> • <i>die veranderlikes (data items) wat benodig word in probleemoplossing (algoritme) te identifiseer;</i> • <i>skatting van waarskynlike reekswaardes vir veranderlikes te doen;</i> • <i>die probleemoplossing-strategie toe te pas op werklike probleme wat veranderlikes en geneste aksie blokke bevat;</i> • <i>die maniere waarin verskillende tipes data die manier affekteer hoe oplossings tot probleme ontwerp word, te verstaan;</i> • <i>toepaslike aksies wat op verskillende data tipes toegepas kan word, te herken;</i> • <i>verskillende maniere te identifiseer waarop seleksie en herhaling uitgevoer kan word en te verstaan hoe verskillende gespesialiseerde kontrolestrukture toepaslik gebruik kan word;</i> • <i>die verskil tussen eenvoudige en saamgestelde seleksiestrukture, en hoe komplekse voorwaardes uitgedruk kan word om seleksiestrukture te beheer, te verstaan;</i> • <i>die verskil tussen bepaalde en onbepaalde herhalings en hoe komplekse kondisies uitgedruk kan word om die herhalings te beheer, te verstaan;</i> • <i>bepaalde: teller- gekontroleerde herhaling;</i> • <i>onbepaalde: nul-of-meer en ten-minste-een keer herhalings;</i> • <i>werklike probleme te analiseer om toepaslike seleksie- en herhalingstrukture te gebruik.</i> 			
Method of delivery:		Full-time	
<i>Metode van aflewering: Voltyds</i>			
Assessment modes: Formative and Summative			
Assesseringsmetodes: <i>Formatief en Summatief</i>			
ITSP111 (Introduction to Problem Solving) is intended for students who have not taken programming at a grade 12 level. ITSP111 (Inleiding tot Probleemoplossing) is bedoel vir studente wat nie programmering op graad 12 vlak geneem het nie.			
Module code: ITSP121	Semester 2	NQF level: 5	
Title: Introductory Programming Principles / Inleiding tot Programmeringsbeginsels			
Module outcomes: On completion of the module the student should be able to: <ul style="list-style-type: none"> • know various components of a computer; • understand how various components of a computer work; • understand how to use various components of a computer effectively; • demonstrate knowledge of how a computer works; • know and explain basic computer concepts; • write basic algorithms. 			
Module-uitkomst:			
<i>Na voltooiing van die module behoort die student in staat te wees om:</i> <ul style="list-style-type: none"> • <i>die onderskeie komponente van 'n rekenaar te ken;</i> • <i>te verstaan hoe die onderskeie komponente van 'n rekenaar werk;</i> • <i>te kan demonstreeer dat hy/sy weet hoe 'n rekenaar werk;</i> • <i>basiese rekenaarkonsepte te ken en te verduidelik;</i> • <i>basiese algoritmes te skryf.</i> 			
Method of delivery:		Full-time	
<i>Metode van aflewering: Voltyds</i>			
Assessment modes: Formative and Summative			
Assesseringsmetodes: <i>Formatief en Summatief</i>			
ITSP121 (Introductory Programming Principles) is preparatory for the regular first level			

module in Programming.
 ITSP121 (*Inleiding tot Programmeringsbeginsels*) is ter voorbereiding vir die gewone eerstevlak module in Programming.

Module code: ITSP113	Semester 1	NQF level: 5
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Title: Introduction to Graphical Interface Programming / *Inleiding tot Grafiese Koppelvlakprogrammering*

Module outcomes:

On completion of the module the student should be able to:

Knowledge

demonstrate that he/she is familiar with basic theoretical programming concepts and have gained basic introductory knowledge and skills of a graphical interface programming environment to develop and test basic programs in a GUI computer programming language;

understand introductory aspects of graphical interface design and event-driven programming;

Skills

- prove that he/she can apply the theory of basic graphical interface programming in a practical way by writing algorithms and subsequently solve basic problems using a GUI programming language.

Module-uitkomst: Na voltooiing van die module behoort die student in staat te wees om:

Kennis

- te demonstreer dat hy/sy vertrouwd is met basiese teoretiese programmeringskonsepte en dat hy/sy oor basiese inleidende kennis en vaardighede van 'n grafiese koppelvlak programmeringsomgewing beskik wat hom/haar in staat stel om basiese programme te ontwikkel en te toets deur die gebruik van 'n GGK rekenaar programmeringstaal;
- inleidende aspekte van grafiese koppelvlakontwerp en gebeurlikheidsgedrewe programmering te verstaan;

Vaardighede

te bewys dat hy/sy die teorie van basiese grafiese koppelvlakprogrammering op 'n praktiese wyse kan toepas deur algoritmes te skryf en vervolgens basiese probleme op te los deur die gebruik van 'n GGK programmeringstaal.

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment modes: Formative: Class tests theory and practical. Lecture /student observation and interaction. Summative: Formal examination.

Assesseringsmetodes: *Formatief: Teoretiese en praktiese klastoetse. Dosent /student waarneming en interaksie. Summatief: Formele eksamen*

ITSP113 (Introduction to Graphical Interface Programming) is preparatory for the regular first level module in Graphical Interface Programming.

ITSP113 (*Inleiding tot Grafiese Koppelvlakprogrammering*) is ter voorbereiding vir die gewone eerstevlak module in Grafiese Koppelvlakprogrammering

Module code: ITSP114	Semester 1	NQF level: 5
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Title: Introduction to Object Oriented Programming / *Inleiding tot Objektegeïntereerde Programmering*

Module outcomes:

On completion of the module the student should be able to:

Knowledge

- demonstrate basic knowledge on and insight in the basic structures, data types, methods, classes and objects of an object oriented programming language;

- demonstrate basic knowledge and insight on problem solving, including: debugging, testing and executing of applications;

Skills

show that he/she can apply the knowledge and insight that have been obtained in problem solving by means of a computer. Specifically he/she should be able to:

- develop a solution plan (algorithm) to solve a problem that has been defined, "translate" (encode) the algorithm in Java, debug it, test it and execute it by means of the computer;
- apply certain steps of problem solving on defined problems;
- use general properties of the programming language Java to develop applications;
- create and use classes in problem solving;
- handle different data types in Java;
- do arithmetic calculations;
- use classes and methods that already have been defined in Java;
- use Java's decision making structures (choice), namely *if* and *switch*, in problem solving;
- use the repeating structures of Java (loops), namely *while*, *do..while* and *for* in problem solving;
- use a good programming style (program readability);
- write structured classes and programs that gives neat output;
- write programs that are user friendly.

Module-uitkomst:

Na voltooiing van die module behoort die student in staat te wees om:

Kennis

- *basiese kennis en insig te demonstreeer van 'n objekgerigte programmeringstaal se basiese strukture, datatipes, metodes, klasse en objekte;*
- *basiese kennis en insig te demonstreeer van probleemoplossing wat insluit: ontfoouting, toetsing en uitvoering van toepassings;*

Vaardighede

te kan bewys lewer dat hy/sy die kennis en insig wat verwerf is, kan toepas in probleemoplossing met behulp van die rekenaar. In besonder behoort hy/sy in staat te wees om:

- *vir 'n probleem wat gedefinieer is, 'n oplossingsplan (algoritme) te ontwikkel om die probleem op te los, die algoritme te "vertaal" (kodeer) in Java, dit te ontfoout, te toets en uit te voer met behulp van die rekenaar;*
- *sekere stappe van probleemoplossing te kan toepas op gedefinieerde probleme;*
- *algemene eienskappe van die programmeringstaal Java te gebruik om toepassings te ontwikkel;*
- *klasse te skep en te gebruik in probleemoplossing;*
- *verskillende datatipes in Java te hanteer;*
- *rekenkundige bewerkings te doen;*
- *klasse en metodes wat reeds in Java gedefinieer is, te kan gebruik;*
- *Java se besluitnemingstrukture (keuse) naamlik if en switch in probleemoplossing te gebruik;*
- *die herhalingsstrukture van Java (lusse), naamlik while, do..while en for te gebruik in probleemoplossing;*
- *'n goeie programmeringstyl te gebruik (programleesbaarheid);*
- *gestruktureerde klasse en programme te skryf wat netjiese uitvoer lewer;*
- *programme te skryf wat gebruikersvriendelik is.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment modes: Formative: Class tests theory and practical. Lecture /student observation and interaction. Summative: Formal examination.

Assesseringsmetodes: <i>Formatief: Teoretiese en praktiese klastoetse. Dosent /student waarneming en interaksie. Summatief: Formele eksamen</i>		
ITSP114 (Introduction to Object Oriented Programming) is preparatory for the regular first level module in Programming. <i>ITSP114 (Inleiding tot Objektegeïntereerde Programmering) is ter voorbereiding vir die gewone eerstevlak module in Programmering</i>		
Module code: STTF115	Semester 1	NQF level: 5
Title: Descriptive Statistics / Beskrywende Statistiek		
Module outcomes: On completion of the module the student should be able to:		
<ul style="list-style-type: none"> demonstrate fundamental knowledge of the most important elementary statistical techniques that are used daily, such as sampling methods, graphical representation of data, descriptive measures of location and spread, least squares line fitting, prediction from least squares lines, the coefficient of correlation, multiple linear regression with applications in prediction, time series data, movement components to predict future outcomes, practical considerations regarding sample surveys and sample sizes; demonstrate problem solving skills by analysing known and unknown problems, using knowledge to apply sampling methods, graphical representation of data, descriptive measures of location and spread, least squares line fits, predictions using least squares fits, correlation coefficients, interpretation of multiple linear regression output, movement component calculations, prediction of future outcomes time series data and sample size determination to real life data. 		
<i>Module uitkomst:</i>		
<i>Na voltooiing van hierdie module moet die student in staat wees om:</i>		
<ul style="list-style-type: none"> fundamentele kennis te demonstreer van die belangrikste elementêre statistiese tegnieke wat daaglik gebruik word soos byvoorbeeld steekproef metodes, grafiese voorstelling van data, beskrywende maatstawwe van lokaliteit en spreiding, kleinste-kwadrat lynpassing, voorspelling van kleinste-kwadrat lyne, korrelasiekoëffisiënt, Meervoudige lineêre regressie met toepassings in voorspellings, tydreeks data, bewegingskomponente om toekomstige uitkomst te voorspel, praktiese oorwegings aangaande steekproefnemings en steekproefgroottes; Probleemoplossingsvaardighede te demonstreer deur bekende en onbekende probleme te analiseer, kennis toepas op steekproefmetodes, grafiese voorstellings van data, beskrywende maatstawwe van lokaliteit en spreiding, kleinste-kwadrat lynpassing, voorspelling deur die gebruik van kleinste-kwadratlynpassings, korrelasiekoëffisiënt, interpretasie van meervoudige lineêre regressie uitvoer, bewegingskomponent berekenings, voorstelling van toekomstige uitkomst, tydreeks data en steekproefgrootte bepaling met lewenswerklike data. 		
Method of delivery: Full-time		
<i>Metode van aflewering:</i> Voltyds		
Assessment modes: Summative: 1 x 2 hour examination; weight – 50		
This is a guideline and can change		
Assesserings metodes: <i>Summatief: 1 x 2 uur eksamen; gewig – 50</i>		
<i>Hierdie is slegs 'n riglyn en kan verander</i>		
Module code: STTF125	Semester 2	NQF level: 5
Title: Introductory Statistical Inference / Inleidende Statistiese Inferensie		
Module outcomes:		
On completion of the module the student should be able to:		
<ul style="list-style-type: none"> demonstrate fundamental knowledge of probability and probability distributions, the central limit theorem, estimation of population parameters by the use of point and interval estimation, hypotheses testing for population means and proportions 		

for one and two samples, one-way analysis of variance (ANOVA) and categorical data analysis, contingency tables and basic tests on categorical data;

- demonstrate problem solving skills by analysing known and unknown problems, using knowledge to do simple probability calculations, apply the central limit theorem, estimate population parameters using point and interval estimation, test hypotheses for population means and population proportions for one and two samples, apply one-way analysis of variance (ANOVA) methods and interpret computer output, apply methods for categorical data analysis such as contingency tables and basic tests on categorical data.

Module uitkomst:

Na voltooiing van hierdie module moet die student in staat wees om:

- *fundamentele kennis te demonstreeer van die belangrikste elementêre statistiese tegnieke wat daaglik gebruik word soos byvoorbeeld steekproef metodes, grafiese voorstelling van data, beskrywende maatstawwe van lokaliteit en spreiding, kleinste-kwadrat lynpassing, voorspelling van kleinste-kwadrat lyn, korrelasiekoëffisiënt, Meervoudige lineêre regressie met toepassings in voorspellings, tydreeks data, bewegingskomponente om toekomstige uitkomst te voorspel, praktiese oorwegings aangaande steekproefnemings en steekproefgroottes; Probleemoplossingsvaardighede te demonstreeer deur bekende en onbekende probleme te analiseer, kennis toepas op steekproefmetodes, grafiese voorstellings van data, beskrywende maatstawwe van lokaliteit en spreiding, kleinste-kwadrat lynpassing, voorspelling deur die gebruik van kleinste-kwadratlynpassings, korrelasiekoëffisiënt, interpretasie van meervoudige lineêre regressie uitvoer, bewegingskomponent berekenings, voorstelling van toekomstige uitkomst, tydreeks data en steekproefgrootte bepaling met lewenswerklike data.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment modes: Summative: 1 x2 hour examination; weight – 50

This is a guideline and can change

Assesserings metodes: *Summatief: 1 x 2 uur eksamen; gewig – 50*

Hierdie is slegs 'n riglyn en kan verander

Module code: STTF215	Semester 1	NQF level: 6
Title: Practical Statistics / <i>Praktiese Statistiek</i>		
Module uitkomst:		
Na voltooiing van hierdie module moet die student in staat wees om:		
<ul style="list-style-type: none"> • die belangrike vereistes vir vraelys ontwerp te verstaan; • stappe in data voorbereiding voor data analise te identifiseer en toe te pas; • rekenaaruittrekkings te interpreteer; nl. Grafieke, tabelle, beskrywende statistiek maatstawwe en waarskynlikhede; • 'n statistiek pakket te gebruik om data te analiseer; • die eenvoudige en meervoudige lineêre regressiemodel te verstaan en sowel as die beredenering agter die aannames in die regressiemodel; • enige afwykings van die aannames te diagnoseer en dan regstellende aksies toe te pas om die afwykings te korrigeer; • tydreeks data te analiseer en te voorspel; • 'n suksesvolle statistiese projek uit te voer vanaf ontwerp tot analise. 		
Method of delivery: Full-time		
<i>Metode van aflewering: Voltyds</i>		
Assessment modes: Summative: 1 x 3 hour examination; weight – 50 This is a guideline and can change		
Assesserings metodes: <i>Summatief: 1 x2 uur eksamen; gewig – 50</i>		
<i>Hierdie is slegs 'n riglyn en kan verander</i>		
Module code: STTF225	Semester 2	NQF level: 6
Title: Introduction to Probability / <i>Inleiding tot Waarskynlikheidsleer</i>		
Module outcomes:		
On completion of the module the student should be able to:		
<ul style="list-style-type: none"> • demonstrate knowledge of concepts such as outcome space, events, probability measures, counting processes, stochastic outcomes of events and the independence of events; • demonstrate knowledge of important probability theorems, such as the law of total probability and the theorem of Bayes; • demonstrate knowledge of stochastic variables, distribution functions and mass functions (Special attention will be given to discrete stochastic variables and the following distributions will be discussed in depth: binomial, geometric, negative binomial, hyper geometric and Poisson distributions. The following continuous random variables, together with their distribution functions will be discussed in detail: exponential, gamma and normal distributions. Functions of these variables will also be discussed.); • demonstrate knowledge of probability structures of two or more stochastic variables defined in the same outcome space and functions of joint distributions. 		
Module uitkomst:		
Na voltooiing van die module behoort die student in staat te wees om:		
<ul style="list-style-type: none"> • 'n begrip te demonstreer vir konsepte soos die uitkomst ruimte, gebeurtenisse, waarskynlikheidsmate, telprosesse, stogasties uitkoms van gebeurtenisse en die onafhanklikheid van gebeurtenisse; • 'n begrip te demonstreer van belangrike waarskynlikheidsleerstelling soos die wet van die totale waarskynlikheid en die stellings van Bayes; 		

- 'n begrip van die stogastiese veranderlikes, verdelingsfunksies en massafunksie. (Spesiale aandag sal geskenk word aan diskrete stogastiese veranderlikes en die volgende verdelings sal in diepte bespreek word: binomiaal, geometries, negatief binomiaal, hipergeometries en Poisson. Die volgende kontinue stogastiese veranderlikes te same met hul verdelingsfunksies sal in detail bespreek word: eksponensieel, gamma en normaalverdelings. Funksies van hierdie veranderlikes sal ook bespreek word)
- Meervoudige regressie met toepassing in voorspellings

Method of delivery: Full-time
Metode van aflewering: Voltyds

Assessment modes: Summative: 1 x 3 hour examination; weight – 50
 project; weight – 50

This is a guideline and can change.

Assesseringsmetodes: *Summatief:* 1 x 3 uur eksamen; gewig – 50
 projek; gewig – 50

Hierdie is 'n riglyn en mag verander.

Module code: WISS111

Semester 1

NQF level: 5

Title: Introduction to Mathematics I / *Inleiding tot Wiskunde I*

Module outcomes:

On completion of the module the student should be able to:

- demonstrate knowledge on an introductory level of functions, exponential laws, logarithmic laws, limit laws and other basic theorems;
- demonstrate knowledge on different types of graphs, solving systems of linear equations, linear programming problems in two variables, limits, analysing the rate of change of functions, the Remainder theorem and Factor theorem to factorize polynomials and solve equations;
- apply and demonstrate mathematical concepts and properties by simplifying expressions and solving linear and quadratic equations and linear inequalities

Module-uitkomst:

Na voltooiing van die module behoort die student in staat te wees om:

- kennis op inleidende vlak te demonstreeer van funksies, eksponentwette, logaritmewette, limietwette en ander basiese stellings;
- kennis te demonstreeer van verskillende tipes grafieke, oplos van stelsels van lineêre vergelykings, lineêre programmering in twee veranderlikes, limiete, analisering van die tempo van verandering van funksies, die Resstelling en die Faktorstelling om polinome te faktoriseer en vergelykings op te los;
- wiskundige eienskappe en konsepte toe te pas en te demonstreeer deur uitdrukkings te vereenvoudig en lineêre en kwadratiese vergelykings en lineêre ongelykhede op te los..

Method of delivery: Full-time
Metode van aflewering: Voltyds

Module code: WISS121	Semester 2	NQF level: 5
Title: Introduction to Mathematics II / Inleiding tot Wiskunde II		
<p>Module outcomes: On completion of the module the student should be able to:</p> <ul style="list-style-type: none"> • demonstrate knowledge on an introductory level of absolute values and the nature of the roots of quadratic equations; • solve inequalities (in general) and equations with absolute values; • demonstrate knowledge on the inverse functions and graphs of polynomials; • demonstrate knowledge on trigonometric functions and identities; • find solutions to equations with trigonometric functions on a given interval as well as general solutions; • demonstrate knowledge on the transformation of functions. 		
Module-uitkomst:		
<i>Na voltooiing van die module behoort die student in staat te wees om:</i>		
<ul style="list-style-type: none"> • kennis op inleidende vlak te demonstreeer van absolute waardes en die aard van die wortels van kwadratiese vergelykings; • ongelykhede (in die algemeen) en vergelykings met absolute waardes op te los; • kennis te demonstreeer van inverse funksies en die grafieke van polinome; • kennis te demonstreeer van trigonometriese funksies en identiteite; • algemene oplossings sowel as oplossings op 'n gegewe interval te vind van vergelykings in trigonometriese funksies; • kennis te demonstreeer van die transformasie van funksies. 		
Method of delivery: Full-time		
<i>Metode van aflewering: Voltyds</i>		
WISS111, 121 (Introduction to Mathematics I/II) are preparatory for the regular first level modules in Mathematics in order to achieve a level of mathematical skills. <i>WISS111,121 (Inleiding tot Wiskunde I/II) is ter voorbereiding vir die gewone eerstevlak modules in Wiskunde, om 'n vlak van wiskundige vaardigheid te bereik</i>		
Module code: WISS113	Semester 1	NQF level: 5
Title: Introduction to Mathematical Techniques I / Inleiding tot Wiskundige Tegnieke I		
<p>Module outcomes: On completion of the module the student should be able to:</p> <ul style="list-style-type: none"> • demonstrate knowledge on an introductory level of number systems and exponential laws; • write simple word problems in mathematical form; • apply and demonstrate mathematical concepts and properties by simplifying expressions and solving linear and quadratic equations and linear and quadratic inequalities. 		
Module-uitkomst:		
<i>Na voltooiing van die module behoort die student in staat te wees om:</i>		
<ul style="list-style-type: none"> • kennis op inleidende vlak te demonstreeer van getalgestelsels en eksponentwette; • eenvoudige woordprobleme wiskundig te formuleer; • wiskundige konsepte en eienskappe toe te pas en te demonstreeer deur uitdrukings te vereenvoudig en lineêre en kwadratiese vergelykings en lineêre en kwadratiese ongelykhede op te los. 		
Method of delivery: Full-time		
<i>Metode van aflewering: Voltyds</i>		

Module code: WISS123	Semester 2	NQF level: 5
Title: Introduction to Mathematical Techniques II / <i>Inleiding tot Wiskundige Tegniese II</i>		
<p>Module outcomes: On completion of the module the student should be able to:</p> <ul style="list-style-type: none"> • demonstrate knowledge on an introductory level of functions, exponential laws, logarithmic laws and limit laws; • demonstrate knowledge on different types of graphs, solving systems of linear equations, linear programming problems in two variables, limits, analysing the rate of change of functions; • demonstrate knowledge on financial mathematics; • apply and demonstrate mathematical concepts and properties by simplifying expressions and solving linear and quadratic equations, linear inequalities, exponential equations and logarithmic equations. <p>Module-uitkomst:</p> <p><i>Na voltooiing van die module behoort die student in staat te wees om:</i></p> <ul style="list-style-type: none"> • <i>kennis op inleidende vlak te demonstreeer van funksies, eksponentwette, logaritmwette en limietwette;</i> • <i>kennis te demonstreeer van verskillende tipes grafieke, oplos van stelsels van lineêre vergelykings, lineêre programmering in twee veranderlikes, limiete en die analisering van die tempo van verandering van funksies;</i> • <i>kennis te demonstreeer van finansiële wiskunde;</i> • <i>wiskundige eienskappe en konsepte toe te pas en te demonstreeer deur uitdrukkings te vereenvoudig, lineêre en kwadratiese vergelykings, lineêre ongelykhede, eksponensiële vergelykings en logaritmiëse vergelykings op te los.</i> 		
Method of delivery:	Full-time	
Metode van aflewering:	Voltyds	
<p>WISS113,123 (Introduction to Mathematical Techniques I/II) are preparatory for the regular first level modules in Mathematics in order to achieve a level of mathematical skills.</p> <p><i>WISS113,123 (Inleiding tot Wiskundige Tegniese I/II) is , ter voorbereiding vir die gewone eerstevlak modules in Wiskunde, om 'n vlak van wiskundige vaardigheid te bereik.</i></p>		

NAS.2.8 MAINSTREAM MODULES / HOOFSTROOM MODULES**NAS.2.8.1 ACCOUNTING / REKENINGKUNDE**

Module code: ACCC111	Semester 1	NQF Level/vlak: 5
Title / Titel: Accounting: Framework, Foundations, Cycle and Financial Reporting / Rekeningkunde: Raamwerk, Grondslae, Siklus en Finansiële Verslagdoening		
<p>Module outcomes / <i>Module-uitkomst</i>:</p> <p>On completion of the module, the student should demonstrate:</p> <ul style="list-style-type: none"> integrated knowledge of basic transactions in the accounting cycle; an ability to identify and evaluate elements of financial statements, within a familiar context; an ability to gather information from source documents and communicate financial information reliably, accurately and coherently when preparing a set of basic financial statements; and acceptable behaviour within the academic environment, inclusive of adherence to rules on plagiarism and copyright principles, and the ability to interact and collaborate effectively with others while taking co-responsibility for his/her own learning progress. / <p><i>Met voltooiing van die module behoort die student die volgende te demonstreeer:</i></p> <ul style="list-style-type: none"> <i>geïntegreerde kennis van die basiese transaksies in die rekeningkundige siklus;</i> <i>die vermoë om die elemente van finansiële state, binne 'n bekende konteks, te identifiseer en te evalueer;</i> <i>die vermoë om inligting vanaf brondokumente te versamel en finansiële inligting betroubaar, akkuraat en samehangend te kommunikeer wanneer 'n stel finansiële state voorberei word; en</i> <i>aanvaarbare gedrag binne die akademiese omgewing, insluitend die nakoming van reëls oor plagiaat en kopieregbeginsels, en die vermoë om effektief met ander saam te werk en te reageer, terwyl medeverantwoordelikheid vir sy/haar eie leerproses geneem word.</i> 		
Module code: ACCC121	Semester 2	NQF Level: 5
Title / Titel: Accounting for different entity forms / Rekeningkunde vir verskillende entiteitsvorme.		
<p>Module outcomes / <i>Module-uitkomst</i>:</p> <p>On completion of the module, the student should demonstrate:</p> <ul style="list-style-type: none"> integrated knowledge of accounting in different entity forms; an ability to identify and evaluate elements of financial statements, within an unfamiliar context; an ability to communicate financial information reliably, accurately and coherently when preparing a set of financial statements, including selected basic disclosures in the notes in the financial statements; and acceptable behaviour within the academic environment, inclusive of adherence to rules on plagiarism and copyright principles, and the ability to interact and collaborate effectively with others whilst taking co-responsibility for his/her own learning progress. <p><i>Met voltooiing van die module behoort die student die volgende te demonstreeer:</i></p> <ul style="list-style-type: none"> <i>geïntegreerde kennis van rekeningkunde binne verskillende entiteitsvorme;</i> <i>'n vermoë om elemente van finansiële state binne 'n onbekende konteks te identifiseer en te evalueer;</i> <i>'n vermoë om finansiële inligting betroubaar, akkuraat en samehangend te kommunikeer wanneer 'n stel finansiële state opgestel word, ingesluit geselekteerde basies openbaarmaking in die notas in die finansiële state; en</i> <i>aanvaarbare gedrag binne die akademiese omgewing, ingesluit die nakoming van die reëls oor plagiaat en kopieregbeginsels, en die vermoë om effektief met ander saam te</i> 		

werk en te reageer, terwyl medeverantwoordelikheid vir sy/haar eie leerproses geneem word.

Module code: ACCF111

Semester 2

NQF Level: 5

Title /Titel : Financial Accounting – Basic Concepts, Accounting Systems and Elementary Financial Reporting / Finansiële Rekeningkunde – Basiese konsepte, rekeningkundige stelsels en elementêre finansiële verslagdoening

Module outcomes / *Module-uitkomst:*

On completion of the module, the student should be able to demonstrate:

- integrated knowledge of the basic transactions of the accounting cycle;
- the ability to identify, evaluate and define basic elements of financial statements, within the familiar context;
- the ability to gather information from source documents and communicate financial information reliably, accurately and coherently when preparing a set of basic financial statements; and
- acceptable behaviour within the academic environment, inclusive of adherence to rules on plagiarism and copyright principles.

Module-uitkomst:

Na voltooiing van die module behoort die student in staat te wees om die volgende te demonstree:

- *'n geïntegreerde kennis van die basiese transaksies van die rekeningkundige siklus;*
- *die vermoë om basiese elemente van finansiële state binne die bekende konteks te identifiseer, te evalueer en te definieer;*
- *die vermoë om inligting vanaf brondokumente in te samel en finansiële inligting betroubaar, akkuraat en samehangend te kommunikeer by die voorbereiding van 'n stel basiese finansiële state; en*
- *aanvaarbare gedrag binne die akademiese omgewing, insluitende die nakoming van reëls oor plagiaat en kopiëring*

Module code: ACCF121

Semester 2

NQF Level: 5

Title /Titel: Financial accounting: Elementary financial reporting, partnerships and companies / Finansiële rekeningkunde: elementêre finansiële verslagdoening, vennootskappe, en maatskappye

Module outcomes / *Module-uitkomst:*

On completion of the module, the student should demonstrate:

- an integrated knowledge of different entity forms;
- the ability to identify and evaluate elements of financial statements within an unfamiliar context;
- the ability to communicate financial information reliably, accurately and coherently when preparing a set of financial statements including selected basic disclosures in the notes to the financial statements;
- acceptable behaviour within the academic environment, inclusive of adherence to rules on plagiarism and copyright principles.

Na voltooiing van die module behoort die student in staat te wees om die volgende te demonstree:

- *geïntegreerde kennis van verskillende vorme van entiteite;*
- *die vermoë om elemente van finansiële state binne 'n onbekende konteks te identifiseer en te evalueer;*
- *die vermoë om finansiële inligting betroubaar, akkuraat en samehangend te kommunikeer, wanneer 'n stel finansiële state, insluitend sekere basiese openbaarmaking in die aantekeninge tot die finansiële state, voorberei word;*
- *aanvaarbare gedrag binne die akademiese omgewing, insluitende die nakoming van reëls oor plagiaat en kopiëring.*

Module code: ACCS111	Semester 2	NQF Level: 5
<p>Title /Titel: Financial Accounting (Special) – Basic Concepts, Accounting Cycle and Accounting Systems / Finansiële Rekeningkunde (Spesiaal) – Basiese konsepte, rekeningkundige stelsels en elementêre finansiële verslagdoening</p>		
<p>Module outcomes / <i>Module-uitkomst</i>: On completing the module the student should be able:</p> <ul style="list-style-type: none"> to explain the purpose and function of accounting; to record transactions in journals, ledger accounts and control accounts; to design an accounting system for a specific enterprise; to compile financial statements for a sole proprietor of an enterprise. <p><i>Na afhandeling van hierdie module behoort die student in staat te wees om:</i></p> <ul style="list-style-type: none"> <i>die doel en funksie van rekeningkunde te kan verduidelik;</i> <i>transaksies in joernale, grootboekrekenings en kontrolerekenings te kan aanteken.</i> <i>'n rekeningkundige stelsel vir 'n spesifieke onderneming te kan ontwerp.</i> <i>elementêre finansiële state vir 'n eenmansaak te kan opstel</i> 		
Module code: ACCS121	Semester 2	NQF Level: 5
<p>Title /Titel: Financial Accounting (Special) – Bank Reconciliation, Elementary Financial Reporting and Analysis and Interpretation of Financial Statements / Finansiële Rekeningkunde (Spesiaal) – Bankrekonsiliasies, elementêre finansiële verslagdoening, elementêre ontleding en vertolking van finansiële state</p>		
<p>Module outcomes / <i>Module-uitkomst</i>: On completing the module the student should be able:</p> <ul style="list-style-type: none"> to record transactions in the cash receipts and payment journal and to compile a bank reconciliation statement; to compile the statement of comprehensive income (income statement), statement of financial position (balance sheet) and statement of change in equity for a sole trader in a generally accepted format; to identify financial ratios and to be able to explain and apply their purpose in analysing and interpreting the liquidity, profitability and solvency of a sole trader. <p><i>Na afhandeling van hierdie module behoort u in staat te wees om:</i></p> <ul style="list-style-type: none"> <i>transaksies in die kontantontvangste en –betalingsjoernaal aan te teken en 'n bankrekonsiliasiestaat op te stel;</i> <i>die staat van omvattende inkomste (inkomtestaat), staat van finansiële posisie (balansstaat) en staat van verandering in ekwiteit vir 'n eenmansaak op te stel op 'n algemeen aanvaarbare formaat;</i> <i>finansiële verhoudings kan identifiseer en die doel daarvan verduidelik en toepas in die ontleding en vertolking van die likwiditeit, winsgewendheid en solvabiliteit van ondernemings</i> 		

Module code: FINM271	Semester 2	NQF Level: 6
Title /Titel: Introduction to applied Financial Management / Inleiding tot toegepaste Finansiële Bestuur		
<p>Module outcomes / <i>Module-uitkomst</i>: On completion of the module, the student should be able to demonstrate the following:</p> <ul style="list-style-type: none"> • Have an intermediate knowledge and logical understanding of key terms, theories and principles in the field of Financial Management. • The ability to apply the appropriate techniques or methods in the field of Financial Management. • The ability to identify and analyse problems within familiar contexts. • The ability to analyse and evaluate information. • The ability to reliably and logically present and communicate information or decisions. • An understanding of the relationship between investment and financing decisions and how decisions in one of these areas impact on the other. • An ability to take responsibility for his/her own decisions, actions and work. <p><i>By voltooiing van die module behoort die student die volgende te kan demonstree:</i></p> <ul style="list-style-type: none"> • 'n <i>Intermediêre kennis en logiese begrip van sleutel terme, teorieë en beginsels in die veld van Finansiële Bestuur.</i> • <i>Die vermoë om toepaslike tegnieke of metodes in die veld van Finansiële Bestuur toe te pas.</i> • <i>Die vermoë om probleme te identifiseer en te analiseer binne bekende kontekste.</i> • <i>Die vermoë om inligting te analiseer en te evalueer.</i> • <i>Die vermoë om inligting of besluite betroubaar en logies aan te bied en te kommunikeer.</i> • <i>'n Begrip van die verband tussen investering- en finansieringsbesluite en hoe besluite in een van die areas 'n impak het op die ander.</i> • <i>Die vermoë om verantwoordelikheid te neem vir sy/haar eie besluite, optrede en werk.</i> 		

NAS.2.8.2 ACADEMIC LITERACY / AKADEMIESE GELETTEDHEID

Module code: ALDE111 / ALDA111	Semester 1	NQF Level: 5
Title /Titel : Introduction to Academic Literacy / Inleiding tot Akademiese Gelettertheid		
<p>Module outcomes / <i>Module-uitkomst</i>: On completion of this module the student should be able to:</p> <ul style="list-style-type: none"> • demonstrate basic knowledge of learning strategies, academic vocabulary and register as well as the reading and writing of academic texts in order to function effectively in the academic environment; • communicate effectively orally and in writing in an appropriate manner in an academic environment; • understand, interpret, and evaluate basic academic texts and write appropriate academic genres in a coherent manner by making use of accurate and appropriate academic conventions; • listen, speak, read and write accurately, fluently and appropriately in an ethical framework. <p><i>Ná suksesvolle voltooiing van die module sal die student in staat wees om:</i></p> <ul style="list-style-type: none"> • <i>basiese kennis van leerstrategieë, akademiese woordeskat en register asook die lees en skryf van akademiese tekste te demonstree ten einde doeltreffend binne die akademiese omgewing te funksioneer;</i> • <i>op gepaste wyse binne 'n akademiese omgewing effektief mondelings en skriftelik as individu en as lid van 'n groep te kan kommunikeer;</i> 		

- *basiese akademiese tekste te verstaan, interpreteer, evalueer en op koherente wyse toepaslike akademiese genres te kan skryf deur gebruik te maak van akkurate en toepaslike akademiese konvensies.*
- *binne 'n etiese raamwerk akkuraat, vlot en toepaslik te kan luister, praat, lees, skryf en leer.*

Module code: ALDE122 / ALDA122

Semester 2

NQF Level: 5

Title /Titel: Academic Literacy / Akademiese Geletterdheid

Module outcomes / *Module-uitkomst:*

On completion of this module, students should be able to:

- demonstrate fundamental knowledge of appropriate computer programs, as well as apply learning, listening, reading and writing strategies, use academic language register and read and write academic texts, in order to function effectively in the academic environment;
- as an individual and a member of a group communicate effectively orally and in writing in an ethically responsible and acceptable manner in an academic environment;
- as an individual and a member of a group find and collect scientific knowledge in a variety of study fields, analyse, interpret, and evaluate texts, and in a coherent manner synthesise and propose solutions in appropriate academic genres by making use of linguistic conventions used in formal language registers.

Ná suksesvolle voltooiing van die module sal die student:

- *oor fundamentele kennis beskik van toepaslike rekenaarprogramme, leer-, luister-, lees- en skryfstrategieë kan toepas, akademiese taalregister kan gebruik en akademiese tekste kan lees en kan skryf, ten einde doeltreffend binne die akademiese omgewing te kan funksioneer;*
- *as 'n individu en as lid van 'n groep effektief mondelings en skriftelik op 'n etiese verantwoordelike en toepaslike wyse kan kommunikeer in 'n akademiese omgewing;*
- *wetenskaplike inligting binne 'n verskeidenheid studieterreine as individu en in groepsverband kan soek en versamel, tekste kan ontleed, interpreteer, evalueer en op koherente wyse sintetiseer en oplossings voorstel in toepaslike akademiese genres deur gebruikmaking van linguïstiese konvensies soos gebruik in formele taalregisters.*

NAS.2.8.3 BIOCHEMISTRY / BIOCHEMIE

Module code / -kode: MCBN111

Semester 1

NQF Level / vlak: 5

Title /Titel: Molecular and Cell Biology I / Molekulêre en Selbiologie I

Module outcomes / *Module-uitkomst:*

After completion of the MCBN111 module, the student should:

- know and be able to use the relevant terminology of Cell Biology
- demonstrate basic knowledge of the biology of the cell, including (1) the composition of the cell, (2) functions and organisation of various cellular components such as the cell membrane, organelles, cell wall and the cytoskeleton (3) cell-cell interactions.
- be able to demonstrate basic theoretical skills regarding cell biology investigation techniques and scientific approaches
- have a basic knowledge of the scientific method in science.

Na voltooiing van die MCBN111 module, behoort die student die volgende te kan demonstreer:

- *kennis van, en die vermoë om, relevante terminologie van Selbiologie te gebruik.*

- *basiese kennis van die biologie van die sel, insluitende (1) die samestelling van die sel, (2) funksies en organisasie van verskeie sellulêre komponente soos die selmembraan, organelle, die selwand en die sitoskelet (3) sel-sel interaksies.*
- *basiese teoretiese vaardighede kan demonstreeer soos gebruik in selbiologiese ondersoeke asook wetenskaplike benaderinge.*
- *'n basiese kennis te hê van die wetenskaplike metode*

Assessment Criteria

Candidates have mastered the outcomes if they are able to:

- use the relevant terminology of Cell Biology
- demonstrate basic knowledge of the biology of the cell, including (1) the composition of the cell, (2) functions and organisation of various cellular components such as the cell membrane, organelles, cell wall and the cytoskeleton (3) cell-cell interactions.
- demonstrate basic theoretical skills regarding cell biology investigation techniques and scientific approaches
- demonstrate a basic knowledge of the scientific method in science.

Assessment Methods – Formal Formative

The student demonstrates his/her newly acquired knowledge and skills by submitting reports on selected relevant cell biology topics.

Assessment Methods – Summative

Summative assessments are in the form of written class tests, a semester test and a final exam to be completed by each candidate.

Assessment Plan

The participation mark consists of the average of the class tests (50%) and the semester test (50 %)

A minimum participation mark of 40 % is required for examination participation.

The participation mark and exam will each contribute 50 % to the module mark.

Die deelnamepunt bestaan uit die gemiddeld van die klastoetse (50%) en die semestertoets (50%).

'n Minimum deelnamepunt van 40 % is nodig vir eksamentoelating.

Die deelnamepunt en eksamen dra elk 50 % by tot die modulepunt.

Module code / -kode: MCBN121	Semester 2	NQF Level / vlak: 5
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Title /Titel: Molecular and Cell Biology II / *Molekulêre en Selbiologie II*

Module outcomes / *Module-uitkomst:*

After completion of the MCBN121 module, the student should:

- demonstrate basic knowledge on the cell, including (1) biomolecules, (2) molecular genetics, (3) energetics, (4) metabolic reactions and enzymes.
- be able to demonstrate basic theoretical skills regarding cell biology investigation techniques and scientific approaches
- have a basic knowledge of the scientific method in science. /

Na voltooiing van die MCBN121 module, behoort die student die volgende te kan demonstreeer:

- *basiese kennis van die sel, insluitende (1) biomolekules, (2) molekulêre genetica, (3) energetika, (4) metaboliese reaksies en ensieme.*
- *basiese teoretiese vaardighede kan demonstreeer soos gebruik in selbiologiese ondersoeke asook wetenskaplike benaderinge.*
- *'n basiese kennis te hê van die wetenskaplike metode*

Assessment Criteria

Candidates have mastered the outcomes if they are able to:

- demonstrate basic knowledge on the cell, including (1) biomolecules, (2) molecular genetics, (3) energetics, (4) metabolic reactions and enzymes.
- demonstrate basic theoretical skills regarding cell biology investigation techniques and scientific approaches
- demonstrate a basic knowledge of the scientific method in science.

Assessment Methods – Formal Formative

The student demonstrates his/her newly acquired knowledge and skills by submitting reports on selected relevant cell biology topics.

Assessment Methods – Summative

Summative assessments are in the form of written class tests, a semester test and a final exam to be completed by each candidate.

Assessment Plan – English

The participation mark consists of the average of the class tests (50%) and the semester test (50 %)

A minimum participation mark of 40 % is required for examination participation.

The participation mark and exam will each contribute 50 % to the module mark.

Assessment Plan – Afrikaans

Die deelnamepunt bestaan uit die gemiddeld van die klastoetse (50%) en die semestertoets (50%).

'n Minimum deelnamepunt van 40 % is nodig vir eksametoelating.

Die deelnamepunt en eksamen dra elk 50 % by tot die modulepunt.

Module code: BCHN213

Semester 1

NQF Level: 6

Title / Titel: Introductory Biochemistry / : Inleidende Biochemie

Module outcomes / *Module-uitkomst:*

After completion of the BCHN213 module, the student should:

- demonstrate detailed knowledge on the flow of genetic information in the biosphere, including the structure and synthesis of nucleic acids and proteins
- be able to evaluate and apply selected biochemical analytical techniques to investigate nucleic acids and proteins.
- be able to solve selected biochemical analytical problems.
- evaluate, interpret and present data generated with selected biochemical analytical methods.
- demonstrate an understanding of the ethical and professional conduct required of a biochemist.

Na voltooiing van die BCHN213 module, behoort die student die volgende te kan demonstree:

- *detail kennis van die vloeï van genetiese informasie in die biosfeer, insluitende die struktuur en sintese van nukleiensure en proteïene.*
- *die vermoë om geselekteerde biochemiese analitiese tegnieke te gebruik om nukleiensure en proteïene mee te ondersoek.*
- *die vermoë om geselekteerde biochemiese analitiese probleme te kan oplos*
- *evalueer, interpreteer en aanbied van data wat verkry is deur geselekteerde biochemiese analitiese tegnieke.*
- *insig van die etiese en professionele gedrag wat van 'n biochemikus vereis word*

Title / Titel: **Metabolism / Metabolisme**Module outcomes / *Module-uitkomst*:

After completion of the BCHN222 module, the student should demonstrate:

- integrated knowledge of the core reactions of metabolism to form the basis to accumulate specialized knowledge in any of the biological sciences like microbiology, zoology, botany and physiology;
- proficient knowledge to evaluate the contribution of food groups to energy productive metabolism under normal and abnormal conditions;
- proficient knowledge to be able to predict the effect of an inherited or a induced change in the activity of an enzyme and the effect it would have on a metabolic pathway and eventually the total metabolism and;
- proficient skills to compile a testing regime to test the change in the metabolic profile using initial simple screening tests followed by more complex diagnostic tests;
- the ability to demarcate the results of an abnormal metabolic profile according to known diagnostic profiles of abnormalities and which and how confirmation analyses could be done in selected cases;
- to have the ability to write a report as if in an advisory position (e.g. doctor / pharmacists / biochemist dietician) to explain abnormal results in layman's terms so that it can be understood, without having any background knowledge of the abnormality;
- and understanding of the safety, ethical and professional conduct required of a professional analytical biochemist

Na voltooiing van die module BCHN222, behoort die student:

- *geïntegreerde kennis te hê van die kern reaksies van metabolisme om die basis te vorm vir die versameling van gespesialiseerde kennis in enige van die biologiese wetenskappe soos mikrobiologie, dierkunde, plantkunde en fisiologie;*
- *voldoende kennis te hê om die bydrae van voedsel groepe tot energie produksie te evalueer onder normale en abnormale omstandighede;*
- *die vermoë hê om te voorspel om te wat die effek van aangebore of geïnduseerde veranderinge van 'n ensiem aktiwiteit sal hê op die metaboliese weë en die totale metabolisme;*
- *voldoende vaardighede om 'n siftings program saam te stel om die verandering van 'n metaboliese profiel te evalueer gevolg deur meer komplekse diagnostiese toetse;*
- *die vermoë te hê om om 'n abnormale metaboliese profiel te evalueer op grond van bekende diagnostiese profiele en abnormaliteite en die kennis van watter en hoe bevestigende analyses uitgevoer kan word op geselekteerde gevalle.*
- *om die vermoë te hê om 'n verslag te skryf in 'n raadgewende hoedanigheid (bv. dokter, apteker, dieetkundige) om die abnormale resultate te verduidelik in eenvoudige terme.*
- *begrip te hê van veiligheids-, etiese- en professionele gedrag wat verwag word van 'n professionele analitiese biochemikus..*

Module code: BCHS316	Semester 1	NQF Level: 7
Title / Titel: Enzymology / Ensiemologie		
Module outcomes / <i>Module-uitkomst</i> : After completion of the BCHS316 module, the student should demonstrate:		
<ul style="list-style-type: none"> • detailed knowledge and understanding of the following key areas of enzymology: <ul style="list-style-type: none"> ➢ the history, nomenclature and structure-function relationship of enzymes; ➢ the concepts of catalysis and kinetics of single- and multi-substrate enzyme-catalysed reactions; ➢ enzyme inhibition and its relevance; ➢ the characteristics of allosteric enzymes, sigmoidal behaviour of enzymes. • an integrated knowledge of how these concepts play a role in metabolism. • the skills to independently gather knowledge of these concepts using all available sources. • detailed knowledge and understanding of the various experimental approaches to enzyme kinetics, the ability to theoretically solve enzyme kinetics problems and critically evaluate the methods used for solving these problems. • skills related to experimental practice, under appropriate supervision, by following the necessary procedures and methods to effectively execute and complete enzyme kinetics experiments, effectively report on the experimental findings, and to deduce conclusions accurately. • an understanding of the ethical and professional conduct required of a biochemist and the ethical issues that arises from work where enzymology is applied. 		
<i>Na voltooiing van die BCHS316 module, behoort die student die volgende te demonstree:</i>		
<ul style="list-style-type: none"> • <i>detail kennis en insig van die volgende hoof areas van ensiemologie:</i> <ul style="list-style-type: none"> ➢ <i>die geskiedenis, nomenklatuur en struktuur-funksie verwantskap van ensieme;</i> ➢ <i>die konsepte van katalise en kinetika van een- en multi-substraat ensiemgekataliseerde reaksies;</i> ➢ <i>ensiem-inhibisie en die relevansie daarvan</i> ➢ <i>die eienskappe van allosteriese ensieme en sigmoidale gedrag van ensieme.</i> • <i>geïntegreerde kennis van die rol wat hierdie konsepte in die metabolisme speel.</i> • <i>die vaardighede om op 'n onafhanklike wyse kennis te bekom deur van alle bestaande bronne gebruik te maak.</i> • <i>detail kennis en insig van die onderskeie eksperimentele benaderings tot ensiemkinetika, die vermoë om teoretiese probleme in ensiemkinetika te kan oplos asook die vermoë om die metodes wat gebruik word om hierdie probleem op te los krities te kan evalueer.</i> • <i>vaardighede beskik oor eksperimentele praktyke en, onder gepaste toesig, die nodige prosedures en metodes te volg ten einde ensiemkinetika eksperimente effektief uit te voer en te voltooi, eksperimentele bevindinge effektief te rapporteer en om konklusies akkuraat te maak;</i> • <i>insig van die etiese en professionele gedrag wat van 'n biochemikus vereis word, asook die etiese kwessies wat vanuit toepassings van ensiemologie mag ontstaan.</i> 		
Module code: BCHS317	Semester 1	NQF Level: 7
Title / Titel: Molecular Biology / Molekulêre Biologie		
Module outcomes / <i>Module-uitkomst</i> : After completion of the BCHS317 module, the student should demonstrate:		
<ul style="list-style-type: none"> • detailed knowledge and understanding of the following key areas of biochemistry: 1) the genome structure of eukaryotes; 2) the unlocking of genetic information in 		

eukaryotic cells ; 3) the regulation of unlocking of genetic information in eukaryotic cells; 4) the fundamentals and applications of recombinant DNA technology

- an integrated knowledge of how these concepts play a role in biochemistry and biotechnology
- detailed knowledge and understanding of the various experimental methods and approaches in molecular biology, the ability to theoretically solve biological problems and critically evaluate the methods used for solving these problems
- skills related to experimental practice, under appropriate supervision, by following the necessary procedures and methods to effectively execute and complete experiments to obtain, manipulate and transfer genetic material between organisms, determine the methylation status of genomic DNA and the ability to effectively interpret, report on the experimental findings, and to deduce conclusions accurately.
- an understanding of the ethical and professional conduct required of a biochemist and the ethical issues that arises from work where biochemistry and molecular biology is applied.

Na voltooiing van die BCHS317 module, behoort die student die volgende te demonstree:

- *detail kennis en insig van die volgende hoof areas van biochemie: 1) die genomstruktuur van eukariote; 2) die ontsluiting van genetiese inligting in eukariotiese selle; 3) die regulering van die ontsluiting van genetiese inligting in eukariotiese selle; 4) die beginsels en toepassings van rekombinante DNA tegnologie*
- *'n geïntegreerde kennis van die rol wat hierdie konsepte in biochemie en biotegnologie speel*
- *detail kennis en insig van die onderskeie eksperimentele metodes en benaderings in molekulêre biologie, die vermoë om biologiese probleme teoreties op te los asook die vermoë om die metodes wat gebruik word om hierdie probleme op te los krities te kan evalueer*
- *vaardighede om eksperimentele praktyke en, onder gepaste toesig, die nodige prosedures en metodes te volg ten einde eksperimente om genetiese materiaal te bekom, te manipuleer en tussen organismes oor te dra en die metilerings status genomiese DNA te bepaal effektief uit te voer en te voltooi, eksperimentele bevindinge effektief te rapporteer en om gevolgtrekkings akkuraat te maak*
- *insig van die etiese en professionele gedrag wat van 'n biochemikus vereis word, asook die etiese kwessies wat vanuit toepassings van biochemie en molekulêre biologie mag ontstaan*

Module code: BCHS321

Semester 2

NQF Level: 7

Title / Titel: Analytical Biochemistry / Analitiese Biochemie

Module outcomes / Module-uitkomst:

After completion of the BCHS321 module, the student should be able to demonstrate:

- he/she has detailed knowledge to (i) use important characteristics of proteins for the process of protein isolation and characterization and isolation efficacy evaluation, (ii) understand the concept of chromatographic separation and to demonstrate how knowledge of chemical characteristics of unknown compounds can be applied to predict chromatographic elution order of complex biological mixtures under specific chromatographic conditions, (iii) apply knowledge of centrifugation techniques to separate cell organelles and more specifically to progress to the level of protein separation by applying certain concepts of centrifugation, (iv) basic functioning of mass spectrometry, description of specific ionization techniques, application in the analytical environment and the types of

molecules which can be analysed with mass spectrometry and the application of mass spectrometry to identify and quantify unknown metabolites. (v) application of electrophoresis techniques for the separation and identification of biological molecules, (vi) Evaluation and selection of the most suitable analytical technique for a specific technique based on detailed knowledge of analytical biochemistry;

- he/she has problem solving skills with regard to the application of analytical techniques in practice. This includes the interpretation of data on qualitative and quantitative level and the ability to critically evaluate the results;
- he/she can apply the concept of good laboratory practice in the experimental process, in data generation and communication of results with good supportive arguments;
- he/she can independently use additional sources of knowledge and information like scientific publications, books and the internet to evaluate results critically;
- he/she is familiar with the implication of ethics and professional practice in the application of analytical biochemistry.

Na voltooiing van die BCHS321 module, behoort die student te kan demonstree dat:

- *hy/sy oor geïntegreerde kennis beskik om (i) belangrike eienskappe van proteïene te kan benut vir die proses van proteïen isolasie en karakterisering en die mate van sukses in die isolasie proses te kan evalueer (ii) die beginsels waarop chromatografiese skeidings berus te verstaan en aan te toon hoedat chemiese eienskappe van onbekende verbindings gebruik kan word om chromatografiese skeiding te voorspel van komplekse biologiese mengsels onder spesifieke chromatografiese kondisies (iii) kennis van sentrifugerings tegnieke te kan aanwend om selorganelle van mekaar te kan skei en meer spesifiek tot op die vlak van proteïen skeiding te kan vorder deur sekere beginsels van sentrifugering toe te pas. (iv) massaspektrometrie se basiese werking te kan beskryf en meer spesifiek sekere ionisasie tegnieke in detail te kan beskryf, hoedat hierdie tegniek aangewend kan word in die analitiese omgewing, tipes verbindings wat hierdeur geïdentifiseer kan word en die gebruik van hierdie tegniek om onbekende metaboliete te identifiseer en te kwantifiseer. (v) Elektroforetiese tegnieke te kan aanwend vir die skeiding en identifisering van biologiese molekules. (vi) Evaluering van die mees geskikte analitiese tegniek vir 'n spesifieke eksperiment te kan uitvoer en motiveer op grond van gedetailleerde kennis van analitiese biochemie;*
- *hy/sy oor probleemoplossing vaardighede beskik met betrekking tot die toepassing van die analitiese tegnieke in die praktyk. Dit sluit verder die vermoë in om data beide op kwalitatiewe en kwantitatiewe vlak te kan interpreteer en krities te besin oor die resultaat;*
- *hy/sy, die beginsels van goeie laboratorium praktyk sal toepas in die eksperimentele proses, in data generering en kommunikasie en afleidings oor resultate te ondersteun met goed gefundeerde argumente;*
- *hy/sy addisionele kenbronne soos boeke, wetenskaplike publikasies en die internet selfstandig kan raadpleeg om resultate krities te beoordeel; hy/sy die implikasie van etiek en professionele praktyk in die toepassing van analitiese biochemie begryp en in beginsel kan aanwend.*

Module code: BCHS322	Semester 2	NQF Level: 7
Title / Titel: Biochemistry Research Project / Biochemie Navorsingsprojek		
Module outcomes / Module-uitkomst:		
<p>After completion of the module BCHS322, the student should demonstrate:</p> <ul style="list-style-type: none"> • sufficient knowledge of the integrated theoretic and practical principles and considerations for planning and carrying out a research project in Biochemistry; • the ability to assimilate multiple sources of knowledge such as books, journals and the internet on particular topics within the field of Biochemistry, and critically evaluate, review and integrate this knowledge to prepare a literature study and motivate a research proposal; • integrated knowledge and understanding of the theoretical basis and applications of appropriate analytical equipment and methods that are used in the projects • the ability to design project-oriented experiments, identify appropriate methods and perform experiments and carry out a small research project in group context, under appropriate supervision; • the ability to critically evaluate, interpret, present and communicate results of experiments in the form of preparing and presenting a research poster • the ability to identify ethical issues in biological research and have an understanding of professional conduct required of a professional biochemist. <p><i>Na voltooiing van die module BCHS322, behoort die student bewys te lewer van:</i></p> <ul style="list-style-type: none"> • <i>genoegsame kennis van die geïntegreerde teoretiese en praktiese beginsels en oorwegings vir die beplanning en uitvoering van navorsingsprojek in Biochemie;</i> • <i>die vermoë om 'n verskeidenheid van bronne van inligting en kennis, soos boeke, joernale en die internet oor 'n spesifieke onderwerp in Biochemie te assimileer, krities die inligting te evalueer en die kennis te kan integreer in 'n literatuuroorsig en 'n navorsingsvoorstel te kan motiveer;</i> • <i>geïntegreerde kennis en begrip van die teoretiese basis en toepassings van geskikte analitiese apparaat en metodes wat in die projekte gebruik word;</i> • <i>die vermoë om projek georiënteerde eksperimente te kan ontwerp, toepaslike metodes te identifiseer en 'n klein navorsingsprojek in groepverband onder gekikte toesig te kan uitvoer;</i> • <i>die vermoë om resultate van eksperimente krities te kan evalueer, interpreteer, aanbied en kommunikeer in die vorm van die voorbereiding van en aanbied van 'n plakkaat;</i> • <i>die vermoë om etiese kwessies in biologiese navorsing te kan identifiseer en 'n begrip te hê van die etiese en professionele gedrag wat van 'n professionele biochemikus verwag kan word.</i> 		

NAS.2.8.4 BUSINESS MATHEMATICS AND INFORMATICS / BEDRYFSWISKUNDE EN INFORMATIKA

Module code: BWIA111	Semester 1	NQF Level: 5
Title / Titel: Introduction to Financial Mathematics / Inleiding tot Finansiële Wiskunde		
Module outcomes / Module-uitkomst:		
<p>At the end of this module, the student will have acquired knowledge and insight into the calculation of <i>interest</i>, time value of money, present and future values, nominal and effective interest rates and annuities and loans.</p>		

In this module, the student acquires skills to handle vaguely defined problems and to integrate concepts from the financial-economic world that can be quantified with the aid of mathematical models and solved by means of computer spreadsheet-based implementation.

Specific attention is given to playing off simulation versus the analytical, as well as to discrete versus stochastic modelling of such problems.

Aan die einde van hierdie module het die student kennis en insig verwerf oor renteberekening, die tydwaarde van geld, huidige en toekomstige waardes, nominaal- en effektiewe koerse en annuïteite en lenings.

Die student verwerf in hierdie module vaardigheid in die hantering van vaag gedefinieerde probleme, en die integrering van begrippe uit die finansieel-ekonomiese wêreld wat met behulp van wiskundige modelle gekwantifiseer kan word en met behulp van rekenaar sigbladgebaseerde implementering opgelos kan word.

Spesifieke aandag word gegee aan die afspeel tussen simulاسie vs. analitiese asook diskrete vs. stogastiese modellering van sulke problem

Module code: BWIA121

Semester 2

NQF Level: 5

Title/ Titel: Introduction to Actuarial Science / Inleiding tot Aktuariële Wetenskap

Module outcomes / *Module-uitkomst*:

On completion of the module the student will demonstrate a knowledge and understanding of:

- (i) the calculation of interest;
- (ii) time value of money;
- (iii) present and future values;
- (iv) nominal and effective rates;
- (v) annuities;
- (vi) loans;
- (vii) using a generalised cash flow model to describe financial transactions;
- (viii) taking into account the time value of money using the concepts of compound interest and discounting;
- (ix) showing how interest rates or discount rates may be expressed in terms of different time periods;
- (x) real and money interest rates;
- (xi) calculating the present value and the accumulated value of a stream of equal or unequal payments using specified rates of interest and the net present value at a real rate of interest, assuming a constant rate of inflation;
- (xii) the definitions and use of more important compound interest functions including annuities certain;
- (xiii) life insurance and specifically about general life insurance products and their associated risks;
- (xiv) general/short-term insurance and specifically about general short-term insurance products and their associated risks;
- (xv) medical care and specifically about medical aid funds and medical insurance and their associated risks; and
- (xvi) banking and financial institutions and their associated risks.

The first 6 concepts ((i) to (vi)) are presented in the form of a self-created project.

In this module, the student acquires skills to handle vaguely defined problems and to integrate concepts from the financial-economic world that can be quantified with the aid of mathematical models and solved by means of computer spreadsheet-based implementation.

Specific attention is given to playing off simulation versus the analytical, as well as to discrete versus stochastic modelling of such problems.

Aan die einde van hierdie module het die student kennis en insig verwerf oor:

- (i) *renteberekening;*
- (ii) *die tydwaarde van geld;*
- (iii) *huidige en toekomstige waardes;*
- (iv) *nominale en effektiewe koerse;*
- (v) *annuïteite;*
- (vi) *lenings;*
- (vii) *die gebruik van 'n veralgemeende kontantvloeimodel om finansiële transaksies te beskryf;*
- (viii) *die berekening van die tydwaarde van geld deur die gebruik van die konsepte van saamgestelde rente en verdiskontering;*
- (ix) *om te wys hoe rentekoerse of verdiskonteringskoerse uitgedruk mag word in terme van verskillende tydspanne;*
- (x) *reële en geldrentekoerse;*
- (xi) *die berekening van die huidige waarde en toekomstige waarde van 'n reeks gelyke of ongelyke betalings vir gegewe rentekoerse asook die netto huidige waarde teen 'n reële rentekoers onder die aanname van 'n konstante inflasiekoers;*
- (xii) *die definisies en gebruik van meer belangrikste saamgestelde rente funksies insluitende vaste lyfrente;*
- (xiii) *lewensversekering en veral oor algemene lewens-versekeringsprodukte en die risiko's gepaardgaande daarmee;*
- (xiv) *algemene/kort-termyn versekering en veral oor algemene korttermynversekeringsprodukte en die risiko's gepaardgaande daarmee;*
- (xv) *aftreevoorsiening en veral oor vaste voordeel en vaste bydrae aftreefondse en die risiko's gepaardgaande daarmee;*
- (xvi) *mediese sorg en veral oor algemene mediese fondse en versekering en die risiko's gepaardgaande daarmee; en*
- (xvii) *bankwese en finansiële instansies en die risiko's gepaardgaande vir sulke instansies*

Die student sal ook as 'n individu of as deel van 'n groep demonstree hoe:

- (i) *om goed-gedefinieerde maar onbekende probleme op te los deur middel van korrekte prosedures en toepaslike bewyse;*
- (ii) *om 'n kritiese analise en samevatting van inligting;*
- (iii) *om inligting voor te lê deur middel van basiese inligtingstegnologie;*
- (iv) *en om inligting betroubaar en samehangend voor te lê en aan te bied deur middel van aanvaarde akademiese/professionele gebruik en format deur geïntegreerde assessering van doelwitte (i) tot (xiv) in die vorm van projekte.*

Module code: BWIA271

Year module

NQF Level: 6

Title/ Titel: Financial Mathematics (A201/CT1) / Finansiële Wiskunde (A201/CT1)

Module outcomes / Module-uitkomst:

On completion of the module the student will demonstrate a sound knowledge and understanding of:

- (i) using a generalised cash flow model to describe financial transactions.

- (ii) taking into account the time value of money using the concepts of compound interest and discounting.
- (iii) showing how interest rates or discount rates may be expressed in terms of different time periods.
- (iv) real and money interest rates.
- (v) calculating the present value and the accumulated value of a stream of equal or unequal payments using specified rates of interest and the net present value at a real rate of interest, assuming a constant rate of inflation.
- (vi) the definitions and use of more important compound interest functions including annuities certain.
- (vii) the definition of an equation of value.
- (viii) describing how a loan may be repaid by regular instalments of interest and capital.
- (ix) using discounted cash flow techniques in investment project appraisal.
- (x) describing the investment and risk characteristics of the following types of asset available for investment purposes:
 - (a) fixed interest government borrowings
 - (b) fixed interest borrowing by other bodies
 - (c) shares and other equity-type finance
 - (d) derivatives
- (xi) analysing elementary compound interest problems.
- (xii) calculating the delivery price and the value of a forward contract using arbitrage free pricing methods.
- (xiii) the term structure of interest rates.
- (xiv) simple stochastic models for investment returns.

The student will also as an individual or as a member of a group demonstrate the ability to:

- (i) solve well-defined but unfamiliar problems using correct procedures and appropriate evidence
- (ii) perform a critical analysis and synthesis of information
- (iii) present information using basic information technology
- (iv) present and communicate information reliably and coherently, using academic/professional discourse conventions and formats appropriately through integrated assessment of objectives (i) to (xiv) in the form of project(s).

Na voltooiing van die module behoort die student in staat te wees om 'n grondige kennis en begrip van:

- (i) *die gebruik van 'n veralgemeende kontantvloeiemodel om finansiële transaksies te beskryf;*
- (ii) *die berekening van die tydwaarde van geld deur die gebruik van die konsepte van saamgestelde rente en verdiskontering;*
- (iii) *om te wys hoe rentekoerse of verdiskonteringskoerse uitgedruk mag word in terme van verskillende tydspannes;*
- (iv) *reële en geldrentekoerse;*
- (v) *die berekening van die huidige waarde en toekomstige waarde van 'n reeks gelyke of ongelyke betalings vir gegewe rentekoerse*

- asook die netto huidige waarde teen 'n reële rentekoers onder die aanname van 'n konstante inflasiekoers;
- (vi) die definisies en gebruik van meer belangrike saamgestelde rente funksies insluitende vaste lyfrente;
 - (vii) die definisie van 'n waardevergelyking;
 - (viii) die beskrywing van hoe 'n lening terugbetaal kan word met gereelde terugbetalings van rente en kapitaal;
 - (ix) die gebruik van die tegniek van die verdiskontering van kontantvloei in die waardering van beleggingsprojekte;
 - (x) die beskrywing van die beleggings en risiko-eienskappe van die volgende tipes bates beskikbaar vir belegging:
 - (a) vaste rente regeringslenings;
 - (b) vaste rente lenings van ander instansies;
 - (c) aandele en ander tipe aandeelfinansiering; en
 - (d) afgeleide instrumente.
 - (xi) die analisering van elementere rentekoersprobleme;
 - (xii) die berekening van die afleweringprys en die waarde van 'n vooruitkontrak deur middel van arbitrage-vrylose prysingsmetodes;
 - (xiii) die termynstruktuur van rentekoerse; en
 - (xiv) eenvoudige stogastiese modelle van beleggingsopbrengste.

Die student sal ook as 'n individu of as deel van 'n groep demonstreer hoe:

- (i) om goed-gedefinieerde maar onbekende probleme op te los deur middel van korrekte prosedures en toepaslike bewyse;
- (ii) om 'n kritiese analise en samevatting van inligting;
- (iii) om inligting voor te lê deur middel van basiese inligtingstegnologie;
- (iv) en om inligting betroubaar en samehangend voor te lê en aan te bied deur middel van aanvaarde akademiese/professionele gebruik en format deur geïntegreerde assessering van doelwitte (i) tot (xiv) in die vorm van projekte.

Module code: BWIA272

Year module

NQF Level: 6

Title/ Titel: Financial Mathematics (A211) / Finansiële Wiskunde (A211)

Module outcomes / Module-uitkomst:

After completion of the module, the student should be able to:

- Describe the basic principles of financial modelling, including how to use a generalised cashflow model to describe and value financial transactions.
- Demonstrate detailed knowledge and understanding of the process of data analysis and the characteristics of different data sources, including extremely large data sets.
- Demonstrate detailed knowledge and understanding of the time value of money, real and money interest rates, the term structure of interest rates.
- Demonstrate detailed knowledge and understanding of duration, convexity and how these can be used in the immunisation of cashflows.
- Use discounted cashflows and the concept of equation of value to solve various practical problems of varying complexity.

Module code: BWIA273	Year module	NQF Level: 6
Title/ Titel: Basics of Financial Mathematics		
Module outcomes / <i>Module-uitkomst</i> : After completion of the module, the student should be able to: <ul style="list-style-type: none"> • Describe the basic principles of financial modelling, including how to use a generalised cashflow model to describe and value simple financial transactions. • Demonstrate knowledge and understanding of the process of data analysis and the characteristics of different data sources, including extremely large data sets. • Demonstrate knowledge and understanding of the time value of money, real and money interest rates and the term structure of interest rates. • Use discounted cashflows and the concept of equation of value to solve various practical problems. 		
Module code: BWIA314	Semester 1	NQF Level: 7
Title/ Titel: Models: Stochastic Processes (A202/CT4) / Stogastiese Prosesse (A202/CT4)		
Module outcomes / <i>Module-uitkomst</i> : <p>On completion of the module the student will demonstrate a well-rounded and systematic knowledge and coherent and critical understanding of:</p> <ul style="list-style-type: none"> (i) the principles of actuarial modelling. (ii) the general principles of stochastic processes, and their classification into different types. (iii) the definition and application of a Markov chain. (iv) the definition and application of a Markov process. <p>The student will also as an individual or as a member of a group demonstrate the ability to:</p> <ul style="list-style-type: none"> (a) deal with unfamiliar concrete and abstract problems and issues using evidence-based solutions and theory-driven arguments (b) use well-developed information retrieval skills (c) perform a critical analysis and synthesis of quantitative and/or qualitative data (d) use appropriate IT skills to present results using prescribed formats (e) present and communicate information and their own ideas and opinions in well-structured arguments (f) show an awareness of audience and using academic/professional discourse appropriately through integrated assessment of objectives (i) to (xi) in the form of project(s). <p><i>Na voltooiing van die module behoort die student in staat te wees om afgeronde ker-sistematiese begrip, samevattende en kritiese insig van:</i></p> <ul style="list-style-type: none"> (i) <i>die beginsels van aktuariële modellering;</i> (ii) <i>die algemene beginsels van stogastiese prosesse asook hul klassifikasie in verskillende tipes;</i> (iii) <i>die definisie en toepassing van 'n Markov-ketting;</i> (iv) <i>die definisie en toepassing van 'n Markov-proses;</i> <p><i>Die student sal ook as 'n individu of as deel van 'n groep demonstreer:</i></p> <ul style="list-style-type: none"> (a) <i>hoe om onbekende konkrete en abstrakte probleme en gevolge te hanteer deur middel van stawende bewysde oplossings en argumente gevorm uit teorie;</i> (b) <i>die gebruik van goed ontwikkelde inligtingsonttrekkingsvermoëns;</i> (c) <i>hoe om 'n kritiese analise en samevatting op kwalitatiewe en/of kwantitatiewe dat uit te voer;</i> 		

- (d) *die gebruik van toepaslike IT-vermoëns om resultate voor te lê in 'n voorgeskrewe formaat;*
- (e) *hoe om inligting weer te gee en kommunikeer insluitend sy/haar/hul eie idees en opinies deur middel van 'n goed-afgeronde struktuur;*
- (f) *en 'n bewustheid van sy/haar/hul gehoor deur middel van aanvaarde akademiese/professionele gebruik deur geïntegreerde assessering van doelwitte (i) tot (xi) in die vorm van projekte.*

Module code: BWIA313

Semester 1

NQF Level: 7

Title/ Titel: Actuarial Statistical Models (A204/CT6)

Module outcomes / *Module-uitkomst:*

On completion of the module the student will demonstrate a well-rounded and systematic knowledge and coherent and critical understanding of:

- (i) the concepts of decision theory and the application of them;
- (ii) the calculation of probabilities and moments of loss distributions both with and without limits and risk-sharing arrangements;
- (iii) the fundamental concepts of Bayesian statistics and using these concepts to calculate Bayesian estimators;
- (iv) the concept and general properties of stationary, $I(0)$, and integrated, $I(1)$, univariate time series;
- (v) the concept of a stationary random series;
- (vi) the concept of a filter applied to a stationary random series;
- (vii) the notation for backwards shift operator, backwards difference operator, and the concept of roots of the characteristic equation of time series;
- (viii) the concepts and basic properties of autoregressive (AR), moving average (MA), autoregressive moving average (ARMA) and autoregressive integrated moving average (ARIMA) time series; and
- (ix) the concept and properties of discrete random walks and random walks with normally distributed increments, both with and without drift.
- (x) the construction of risk models involving frequency and severity distributions and the calculation of the moment generating function and the moments for the risk models both with and without simple reinsurance arrangements;
- (xi) the concept of ruin for a risk model. This will include the calculation of the adjustment coefficient and being able to state Lundberg's inequality. This also include the effect on the probability of ruin of changing parameter values and of simple reinsurance arrangements; and the concepts of decision theory and the application of them;
- (xii) techniques for analysing a delay (or run-off) triangle and projecting the ultimate position through applying the techniques;
- (xiii) the fundamental concepts of a generalised linear model (GLM) and describing how a GLM may be applied.
- (xiv) the basic concept of a multivariate autoregressive model.

The student will also as an individual or as a member of a group demonstrate the ability to:

- (a) deal with unfamiliar concrete and abstract problems and issues using evidence-based solutions and theory-driven arguments use well-developed information retrieval skills;
- (b) perform a critical analysis and synthesis of quantitative and/or qualitative data;
- (c) perform a critical analysis and synthesis of quantitative and/or qualitative

- Data;
- (d) use appropriate IT skills to present results using prescribed formats
- (e) present and communicate information and their own ideas and opinions in well-structured arguments;
- (f) show an awareness of audience and using academic/professional discourse appropriately through integrated assessment of objectives (i) to (xxiv) in the form of project(s).

Na voltooiing van die module behoort die student in staat te wees om afgeronde kennis, sistematiese begrip, samevattende en kritiese insig van:

- (i) *die konsepte van beslissingsteorie en toepassing daarvan;*
- (ii) *die berekening van waarskynlikhede en momente van verliesverdelings beide met en sonder grense en risikodelingsooreenkomstes;*
- (iii) *die grondbeginselkonsepte van Bayes-statistieke en die gebruik van hierdie konsepte om Bayes-beramers te bereken.*
- (iv) *die konsepte en algemene eienskappe van stasionêre, $I(0)$, en geïntegreerde, $I(1)$, enkelveranderlike tydreeks;*
- (v) *die konsep van 'n stasionêre tydreeks;*
- (vi) *die konsep van 'n filter toegepas op 'n stasionêre tydreeks;*
- (vii) *die notasie vir 'n terugwaartse skuifbewerker, en die konsepte van wortels op die karakteristieke vergelyking van tydreeks;*
- (viii) *die konsepte en eienskappe van outoregressiewe (AR), bewegende gemiddelde (MA), outoregressiewe bewegende gemiddelde (ARMA) en geïntegreerde outoregressiewe bewegende gemiddelde (ARIMA) tydreeks;*
- (ix) *die konsep en eienskappe van diskrete stogastiese wandelings en stogastiese wandelings met normaalverdeelde inkremente, beide met en sonder dryf;*
- (x) *die konstruksie van risikomodelle wat frekwensie en hewigheidsverdelings behels en die berekening van die momentvoortbringende funksie en die momente van die risikomodelle beide met en sonder eenvoudige herversekeringsooreenkomstes;*
- (xi) *die konsep van ruïnering vir 'n risikomodel. Dit sluit die berekening van die aanpassingskoëffisient en om Lundberg se ongelykheid te kan noem. Dit sluit ook in die effek op die ruïneringswaarskynlikheid deur die verandering van parameterwaardes en eenvoudige herversekeringsooreenkomstes;*
- (xii) *die tegnieke vir die analise van sloef of afloedriediehoeke en die projektering van die eindelike posisie deur middel van hierdie tegnieke;*
- (xiii) *die grondbeginselkonsepte van 'n veralgemeende lineêre model (VLIM) en 'n beskrywing van hoe 'n VLIM toegepas kan word;*
- (xiv) *Die basiese konsep van 'n meerveranderlike outoregressiewe model.*

Die student sal ook as 'n individu of as deel van 'n groep demonstreer:

- (a) *hoe om onbekende konkrete en abstrakte probleme en gevolge te hanteer deur middel van stawende bewysde oplossings en argumente gevorm uit teorie;*
- (b) *die gebruik van goed ontwikkelde inligtingsonttrekkingsvermoëns;*
- (c) *hoe om 'n kritiese analise en samevatting op kwalitatiewe en/of kwantitatiewe data uit te voer;*
- (d) *die gebruik van toepaslike IT-vermoëns om resultate voor te lê in 'n voorgeskrewe formaat;*
- (e) *hoe om inligting weer te gee en kommunikeer insluitend sy/haar/hul eie idees en opinies deur middel van 'n goed-afgeronde struktuur;*

- (f) *en 'n bewustheid van sy/haar/hul gehoor deur middel van aanvaarde akademiese/professionele gebruik deur geïntegreerde assessering van doelwitte (i) tot (xiii) in die vorm van projekte*

Module code BWIA324

Semester 2

NQF Level: 7

Title/ Titel: Survival Models (A202/CT4) / Oorlewingsmodelle (A202/CT4)

Module outcomes / Module-uitkomst:

On completion of the module the student will demonstrate a well-rounded and systematic knowledge and coherent and critical understanding of:

- (i) the concept of survival models.
- (ii) the estimation procedures for lifetime distributions.
- (iii) the derivation of maximum likelihood estimators for the transition intensities in models of transfers between states with piecewise constant transition intensities.
- (iv) the Binomial model of mortality inclusive of the derivation of a maximum likelihood estimator for the probability of death and the comparison of the Binomial model with the multiple state models.
- (v) how to estimate transition intensities depending on age, exactly or using the census approximation.
- (vi) how to test crude estimates for consistency with a standard table or a set of graduated estimates.
- (vii) the process of graduation.

The student will also as an individual or as a member of a group demonstrate the ability to:

- (a) deal with unfamiliar concrete and abstract problems and issues using evidence-based solutions and theory-driven arguments
- (b) use well-developed information retrieval skills
- (c) perform a critical analysis and synthesis of quantitative and/or qualitative data
- (d) use appropriate IT skills to present results using prescribed formats
- (e) present and communicate information and their own ideas and opinions in well-structured arguments
- (f) show an awareness of audience and using academic/professional discourse appropriately through integrated assessment of objectives (i) to (vii) in the form of project(s).

Na voltooiing van die module behoort die student in staat te wees om afgeronde kennis, sistematiese begrip, samevattende en kritiese insig van die:

- (i) *konsep van oorlewingsmodelle;*
- (ii) *die beramingsprosedures vir die verdelings van lewensduur;*
- (iii) *die afleiding van die maksimumaanneemlikheidsberamers vir die oorgangsiensiteite in modelle vir oorgang tussen toestande met stuksgewyse konstante oorgangsiensiteite;*
- (iv) *die Binomiaal model van mortaliteit insluitend die afleiding van 'n maksimumaanneemlikheidsberamer vir die waarskynlikheid van sterfte en 'n vergelyking van die Binomiaalmodel met meertoestandsmodelle.;*
- (v) *hoe om oorgangsiensiteite te beraam wat afhang van ouderdom deur middel van die presiese metode of deur sensusbenadering;*
- (vi) *hoe om die skattings te toets vir konsekwentheid ten opsigte van 'n standaardtabel of vir 'n stel van gladgestrykte skattings; en*
- (vii) *die gladstrykingsproses.*

Die student sal ook as 'n individu of as deel van 'n groep demonstreer:

- a) *hoe om onbekende konkrete en abstrakte probleme en gevolge te hanteer deur middel van stawende bewysde oplossings en argumente gevorm uit teorie;*
- b) *die gebruik van goed ontwikkelde inligtingsontrekkingsvermoëns;*
- c) *hoe om 'n kritiese analise en samevatting op kwalitatiewe en/of kwantitatiewe data uit te voer;*
- d) *die gebruik van toepaslike IT-vermoëns om resultate voor te lê in 'n voorgeskrewe formaat;*
- e) *hoe om inligting weer te gee en kommunikeer insluitend sy/haar/hul eie idees en opinies deur middel van 'n goed-afgeronde struktuur;*
- f) *en 'n bewustheid van sy/haar/hul gehoor deur middel van aanvaarde akademiese/professionele gebruik deur geïntegreerde assessering van doelwitte (i) tot (x) in die vorm van doelwitte (i) tot (vii) in die vorm van projekte.*

Module code: BWIA371

Year Module

NQF Level: 7

Title/ Titel: Contingencies (A203/CT5) / Gebeurlikhede (A203/CT5)

Module outcomes / Module-uitkomst:

On completion of the module the student will demonstrate a well-rounded and systematic knowledge and coherent and critical understanding of:

- (i) simple assurance and annuity contracts, and the developing of formulae for the means and variances of the present values of the payments under these contracts, assuming constant deterministic interest.
- (ii) practical methods of evaluating expected values and variances of the contracts defined in objective (i).
- (iii) using ultimate or select mortality to calculate net premiums and net premium reserves of simple insurance contracts.
- (iv) the calculation, using ultimate or select mortality, of net premiums and net premium reserves for increasing and decreasing benefits and annuity contracts.
- (v) the calculation of gross premiums and reserves of assurance and annuity contracts.
- (vi) straightforward functions involving two lives.
- (vii) methods which can be used to model cash flows contingent upon competing risks.
- (viii) the technique of discounted emerging costs, for use in pricing, reserving and assessing profitability.
- (ix) the principal forms of heterogeneity within a population and the ways in which selection can occur.

The student will also as an individual or as a member of a group demonstrate the ability to:

- (a) deal with unfamiliar concrete and abstract problems and issues using evidence-based solutions and theory-driven arguments
- (b) use well-developed information retrieval skills
- (c) perform a critical analysis and synthesis of quantitative and/or qualitative data
- (d) use appropriate IT skills to present results using prescribed formats
- (e) present and communicate information and their own ideas and opinions well-structured arguments
- (f) show an awareness of audience and using academic/professional discourse appropriately through integrated assessment of objectives (i) to (x)
- (x) in the form of project(s).

Na voltooiing van die module behoort die student in staat te wees om afgeronde kennis, sistematiese begrip, samevattende en kritiese insig van:

- (i) eenvoudige assurance en annuïteitskontrakte, en die ontwikkeling van formules vir die gemiddeldes en varianses van die huidige waarde van die betalings onder hierdie kontrakte onder die aanname van 'n konstante verdiskonteringskoers;
- (ii) praktiese metodes vir die evaluering van verwagte waardes en variansies van eenvoudige kontrakte gedefinieer in doelwit (i);
- (iii) die gebruik van uiteindelijke of geselekteerde mortaliteit om netto premies en netto premie-reserwes van eenvoudige versekeringskontrakte te bereken;
- (iv) die gebruik van uiteindelijke of geselekteerde mortaliteit om netto premies en netto premie-reserwes van stygende en dalende voordele en annuïteite te bereken;
- (v) die berekening van bruto premies en reserwes van assurance en annuïteitskontrakte;
- (vi) eenvoudige funksies wat twee lewens behels;
- (vii) tegnieke wat gebruik kan word om kontantvloei te modelleer wat afhanklik is van kompeterende risikos;
- (viii) die tegniek van verdiskonteerde verskynende kostes vir die gebruik van prysbepaling, reserwebepaling en beoordeling van winsgewendheid; en
- (ix) die hoofvorms van heterogeniteit in 'n populasie en die maniere waarin seleksie kan voorkom.

Die student sal ook as 'n individu of as deel van 'n groep demonstreeer:

- (a) hoe om onbekende konkrete en abstrakte probleme en gevolge te hanteer deur middel van stawende bewysde oplossings en argumente gevorm uit teorie;
- (b) die gebruik van goed ontwikkelde inligtingsonttrekkingsvermoëns;
- (c) hoe om 'n kritiese analise en samevatting op kwalitatiewe en/of kwantitatiewe data uit te voer;
- (d) die gebruik van toepaslike IT-vermoëns om resultate voor te lê in 'n voorgeskrewe formaat;
- (e) hoe om inligting weer te gee en kommunikeer insluitend sy/haar/hul eie idees en opinies deur middel van 'n goed-afgeronde struktuur; en 'n bewustheid van sy/haar/hul gehoor deur middel van aanvaarde akademiese/professionele gebruik deur geïntegreerde assessering van doelwitte (i) tot (ix) in die vorm van projekte.

NAS.2.8.5 BUSINESS MATHEMATICS AND INFORMATICS / BEDRYFSWISKUNDE EN INFORMATIKA

Module code: BWIN321	Semester 2	NQF Level: 7
Title/ Titel: BMI Project: Capital Markets Modelling and Analysis / Bedryfswiskunde Projek: Effektebeurs modellering en analise		
Module outcomes / Module-uitkomst:		
After completion of the module the student should:		
<ul style="list-style-type: none"> • demonstrate a well-rounded and systematic knowledge and coherent and critical understanding of and insight into the mathematical modelling and analysis of financial instruments; 		

- be able to derive and apply mathematical formulas to price and hedge linear claims such as futures contracts and swaps as well as derive and apply binomial pricing of options;
- be able to use the MS Excel software package (or SAS/IML) to practically implement basic numerical procedures to price vanilla options using binomial trees;
- as an individual or as a member of a group demonstrate the ability to plan and conduct research according to standard protocol and to employ appropriate processes, procedures and techniques to solve problems in the field of capital markets modelling and analyses, communicate results effectively, orally and in writing, and to make use of appropriate technologies in all communications. Act ethically sound in dealing with issues and people.

Na die voltooiing van hierdie module behoort die student:

- *te kan demonstreer dat hy/sy oor goed-geformuleerde, sistematiese kennis, koherente en kritiese begrip en insig in die wiskundige modellering en analise van finansiële instrumente beskik;*
- *in staat te wees om die wiskundige formules vir die prysing en verskansing van lineêre instrumente soos termyn kontrakte en ruiltransaksies af te lei en toe te pas. Die student moet ook die binomiale prysing van opsies kan aflei en toepas;*
- *die MS Excel sagteware-pakket (of SAS/IML) te kan gebruik om die basiese numeriese prosedures, om vanilla opsies te prys deur binomiale bome te gebruik, te implementeer;*
- *as individu maar ook as deel van 'n groep te kan demonstreer dat hy/sy die vaardigheid het om navorsing te beplan en te deur te voer soos wat standaard protokol dit voorskryf. Die student moet ook die toepaslike prosesse, prosedures en probleemoplossingstegnieke kan toepas, resultate effektief verbaal en skriftelik kan kommunikeer en van geskikte tegnologieë gebruik maak om dit te doen. Die student moet eties kan optree teenoor mense en werkskewessies.*

Module code: NCHE111	Semester 1	NQF Level: 5
Title / Titel: Introductory Inorganic and Physical Chemistry / Inleidende Anorganiese en Fisiese Chemie		
<p>Module outcomes / <i>Module uitkomst</i>: After completion of the module NCHE111, the student should demonstrate:</p> <ul style="list-style-type: none"> • fundamental knowledge and insight of the properties of substances and compounds, inter molecular interaction, aqueous solutions, chemical equilibria, acids and bases, precipitation and electron transfer reactions. They should be able to apply this knowledge to write down and name chemical formula; • the ability to balance chemical reactions, use and apply stoichiometric and other calculations to find an unknown quantity; • the ability to recognize and apply tendencies from the periodic table (main group elements); • the ability to apply laboratory technique and safety rules; • the ability to explain chemical phenomena, do calculations connected with the phenomena, report results scientifically and to better understand the applications of scientific results in industry and the environment. • the ability to manage chemical reactions by calculating the enthalpy of reactions, determining the rate of reactions, equilibrium constants, and other aspects of aqueous equilibria such as buffer solutions and solubility products. <p><i>Na voltooiing van die module NCHE111, behoort die student:</i></p> <ul style="list-style-type: none"> • <i>fundamentele kennis en insig te demonstreer van die eienskappe van stowwe en bindings, intermolekulêre wisselwerking, waterige oplossings, chemiese ewewigte, sure en basisse, neerslagvorming en elektronoordragreaksies en hierdie kennis te kan toepas om chemiese formules te skryf en te benoem,</i> • <i>reaksievergelykings te balanseer, stoïgiometriese en ander berekenings te gebruik om 'n onbekende grootheid te vind;</i> • <i>die bevoegdheid te hê om tendense en verbande uit die periodieke tabel (hoofgroepe) te verklaar;</i> • <i>vaardighede te demonstreer in die toepassing van laboratorium- en veiligheidsreëls;</i> • <i>bevoeg te wees om waargenome chemiese verskynsels te verklaar, berekenings in verband daarmee uit te voer, resultate wetenskaplik te kommunikeer en toepassings daarvan in die nywerheid en omgewing beter te kan begryp.</i> • <i>die vermoë te hê om chemiese reaksies te bestuur deur die entalpie van reaksies te bereken, die tempo van reaksies te bepaal, ewewigskonstantes te bepaal en ander aspekte van waterige ewewigte soos bufferoplossings en oplosbaarheidsprodukte te bereken</i> 		
Module code: NCHE121	Semester 2	NQF Level: 5
Title: / Titel: Introductory Organic Chemistry / Inleidende Organiese Chemie		
<p>Module outcomes / <i>Module uitkomst</i>: On successful completion of this module the student should be able to demonstrate the following:</p> <ul style="list-style-type: none"> • Knowledge and informed understanding of the concepts underpinning the subthemes of atomic structure, chemical bonding, molecular geometry, organic nomenclature, and intermolecular forces as well as the most important classes of organic compounds, including alkanes, alkenes, benzenes, haloalkanes, alcohols, amines, ethers, carboxylic acids, acyl halides, anhydrides, esters and amides. 		

- An ability to evaluate the structures of organic compounds and thereby identify suitable synthesis procedures with a **limited number of steps**.
- Conduct in the academic environment that adheres to the rules as stipulated by the North-West University code of conduct.
- Utilisation of **basic research skills**, such as sourcing and verifying information from various sources and using this information to construct a coherent body of knowledge. Communicate these discipline-specific ideas in writing in an accurate and coherent way while showing respect for conventions around copyright and plagiarism.
- The ability to apply the green chemistry approach to organic chemistry and to show the relation between our approach to chemistry and the long-term survival of the human race.
- The ability to manage his or her learning and implement the discipline-specific learning strategies given in the NCHE 121 study guide to improve learning problems.

Na suksesvolle voltooiing van hierdie module, behoort die student die volgende te kan demonstreeer:

- Kennis en **ingeligte begrip** van die konsepte wat die volgende subtemas van organiese chemie onderlê atoomstruktuur, chemiese binding, molekulêre geometrie, organiese nomenklatuur en intermolekulêre kragte, sowel as die belangrikste klasse van organiese verbindings, insluitende alkane, alkene, bensene haloalkane, alkohole, amiene, eters, karboksiesure, asielhaliede, anhidriede, ester en amiede.
- Die vermoë om die strukture van organiese verbindings te evalueer en sodoende geskikte sinteseprosedures met 'n **bepaalde aantal stappe** te identifiseer.
- Optrede in die akademiese omgewing wat voldoen aan die gedragskode van die Noordwes-Universiteit.
- Aanwending van **basiese navorsingsvaardighede**, soos insameling en verifikasie van inligting vanuit verskillende bronne en die gebruik van hierdie inligting om 'n koherente geheel saam te stel. Die vermoë om vakspesifieke idees skriftelik te kommunikeer op 'n koherente wyse met inagneming van die konvensies rakende kopiëring en plagiaat.
- Die vermoë om die groen chemie benadering toe te pas op organiese chemie en die verwantskap tussen ons benadering tot chemie en die langtermyn oorlewing van die mensdom aan te toon.

*Die vermoë om sy of haar leeraktiwiteite te bestuur en vakspesifieke leerstrategieë, soos aangetoon in die **NCHE121**studiegids, te implementeer om leerprobleme te verbeter*

Module code: NCHE211

Semester 1

NQF Level: 6

Title/ Titel: Analytical Chemistry II / Analitiese Chemie II

Module outcomes / Module uitkomst:

After completion of the **NCHE211** module, the student should demonstrate:

- integrated knowledge of the basic theories underlying types of errors occurring during chemical analyses, statistics applied on analytical results, taking and preparing samples, quality control, acid-base and complexometric titrations, gravimetry, surface characterisation techniques, atomic spectroscopy, liquid extraction, ion exchange and chromatography;
- appropriate laboratory skills in order to conduct measurements associated with all of the above-mentioned theoretical aspects;

- the ability to demarcate and effectively solve problems associated with the theoretical and practical (experimental) aspects;
- an understanding of the safety, ethical and professional conduct required of a professional analytical chemist.

Na voltooiing van die module NCHE211, behoort die student:

- *geïntegreerde kennis van die basiese teorieë onderliggend tot tipes foute wat tydens chemiese ontledings gemaak word, statistieke berekeninge op analitiese resultate, neem en voorbereiding van monsters, kwaliteitsbetuur, suur-basis en kompleksometriese titrasies, gravimetrie, oppervlakkarakterisering tegnieke, atoomspektroskopie, vloeistof ekstraksie, ioonuitruiling en chromatografie;*
- *toepaslike laboratorium vaardighede te hê om metinge wat verband hou met al die bogenoemde teoretiese aspekte uit te voer;*
- *die vermoë hê om probleme af te baken en doeltreffend op te los wat verband hou met die teoretiese en praktiese (eksperimentele) aspekte;*
- *'n begrip te hê van die veiligheid, etiese en professionele gedrag wat van 'n professionele analitiese chemikus verwag word*

Module code: NCHE212

Semester 1

NQF Level: 6

Title/ Titel: Physical Chemistry II / Fisiese Chemie II

Module outcomes / Module uitkomst:

After completion of the NCHE212 module, the student should demonstrate:

- integrated knowledge of the theories underlying the thermodynamic and kinetic approaches through which chemical reactions in Physical Chemistry are studied;
- detailed knowledge of the fundamental laws of thermodynamics and the ability to theoretically calculate thermodynamic quantities, as well as to interpret and critically evaluate these values in terms of process characteristics;
- detailed knowledge of kinetic quantities measured and calculated, and interpreting kinetic quantities in terms of the reaction mechanism;
- knowledge of experimental methods and techniques typically utilized to determine thermodynamic and kinetic quantities, as well as the ability to effectively use appropriate laboratory skills in order to conduct these measurements;
- the ability to demarcate and effectively solve complex problems related to thermodynamic and kinetic studies in Physical Chemistry, and to apply experimental measurements with theory-driven arguments;
- the ability to critically judge the ethical/professional conduct of others within different professional/ academic environments in chemistry, and to effect change in conduct where necessary.

Na voltooiing van die module NCHE212, behoort die student:

- *geïntegreerde kennis van die teorieë onderliggend aan die termodinamiese en kinetiese benaderings waardeur chemiese reaksies in Fisiese Chemie bestudeer word te demonstree;*
- *gedetailleerde kennis van die fundamentele wette van termodinamika te hê en oor die vermoë beskik om termodinamiese groothede teoreties te bereken, sowel as om hierdie groothede te interpreteer en krities te evalueer in terme van proseseienskappe;*
- *gedetailleerde kennis van gemete en berekende kinetiese groothede te hê en hierdie kinetiese groothede te interpreteer ten opsigte van die reaksiemeganisme;*

- kennis van eksperimentele metodes en tegnieke wat tipies gebruik word om termodinamiese en kinetiese groothede te hê, sowel as oor die vermoë beskik om gepaste laboratoriumvaardighede effektief te gebruik om hierdie metinge uit te voer;
- oor die vermoë beskik om af te baken en komplekse probleme wat verband hou met termodinamiese en kinetiese studies in Fisiese Chemie effektief op te los, en om eksperimentele metings op teoriegedrewe argumente toe te pas;
- oor die vermoë beskik om die etiese/professionele gedrag van ander binne verskillende professionele/akademiese omgewings in chemie krities te beoordeel, en om verandering in gedrag teweeg te bring waar nodig

Module code: CHEN213

Semester 1

NQF Level: 6

Title / Titel: **Organic Chemistry II Pharmacy/Biological Sciences / Organiese Chemie II Farmasie/Biologiese Wetenskappe**

Module outcomes / Module uitkomstede:

After completion of module CHEN213, the student should demonstrate:

- detailed knowledge and a clear understanding of i) factors influencing electron density and reactivity of organic molecules and ii) aromatic, heterocyclic and polyfunctional organic molecules, their properties and reactivity.
- critical understanding of the principles of aromaticity applied to aromatic and heterocyclic compounds, knowledge of classic reactions of aromatic and heterocyclic compounds and the ability to explain reactivity trends.
- critical understanding of polyfunctional organic molecules, their reactivity and mechanistic aspects.
- ability to select, implement and evaluate the correct mechanism to demonstrate the possible progression of specific aromatic and polyfunctional reactions.
- the ability to effectively use appropriate laboratory skills to synthesize and purify selected aromatic and polyfunctional compounds.
- understanding of the ethical and environmental impact that chemistry has on society.

Na voltooiing van die module CHEN611, behoort die student:

- gedetailleerde kennis en 'n duidelike begrip van i) die faktore wat elektrondigtheid en die reaktiwiteit van organiese molekules beïnvloed en ii) aromatisiese, heterosikliese en polifunksionele molekules, hul eienskappe en reaktiwiteit.
- kritiese begrip te toon van die beginsels van aromatisiteit toegepas op aromatisiese en heterosikliese verbindings; kennis van klassieke reaksies van aromatisiese en heterosikliese verbindings te hê en die vermoë om tendense in reaktiwiteit te voorspel.
- kritiese begrip te toon van die chemiese eienskappe en meganistiese aspekte van polifunksionele molekules.
- korrekte meganismes te selekteer, toe te pas en te evalueer om sodoende die moontlike progressie van spesifieke aromatisiese en polifunksionele reaksies te voorspel.
- begrip te toon van die etiese- en omgewingsimpak van chemie op die samelewing

Module code: NCHE221

Semester 2

NQF Level: 6

Title/ Titel: **Inorganic Chemistry II / Anorganiese Chemie II**

Module outcomes / Module uitkomstede:

After completion of the module NCHE221, the student should demonstrate:

- detailed knowledge and a clear understanding of models used to present structure and bonding of atoms and molecules as well as the reaction properties pertaining to the chemistry of the main group elements;

- the ability to derive chemical and atomic properties, as well as to predict important chemical reactions of main group elements from basic principles;
- detailed knowledge of intermolecular forces in solutions and the ability to reproduce the properties, forms of bonding and reactions of s-block and p-block elements;
- the ability to effectively use appropriate laboratory skills and master practical techniques to synthesize and purify specific inorganic compounds of the main group elements;
- the ability to solve a multi-step reaction using suitable reagents and products to ensure the manufacturing of the desired compound, while planning and executing a work schedule;
- a sense of responsibility for fellow humans and the environment in scientific investigations while acting responsible and in accordance with the code of conduct relevant to chemistry.

Na voltooiing van die module NCHE221, behoort die student die volgende te kan illustreer:

- *gedetailleerde kennis en 'n duidelike begrip van die modelle wat gebruik word om struktuur en binding van atome en molekules voor te stel, sowel as die reaksie eienskappe wat van toepassing is op die chemie van hoofgroepelemente;*
- *die vermoë om chemiese- en atomeienskappe uit basiese beginsels te kan aflei en belangrike reaksies van hoofgroepelemente te kan voorspel;*
- *gedetailleerde kennis van intermolekulêre kragte in oplossings en die vermoë om eienskappe, bindingsvorme en reaksies van s- en p-blok elemente te kan weergee*
- *die vermoë om toepaslike laboratoriumsvaardighede effektief te kan gebruik om spesifieke anorganiese verbindinge van die hoofgroepelemente te vervaardig en te suiwer;*
- *die vermoë om 'n multi-stap reaksie te kan weergee deur die nodige reagense en produkte aan te dui om die vervaardiging van die korrekte produk te verseker, terwyl 'n werkskedule beplan en uitgevoer moet kan word;*
- *'n verantwoordelike gevoel in sy/haar chemiese ondersoek vir sy/haar medemens en die omgewing te hê, terwyl hy/sy volgens die gedragskode van chemici optree*

Module code: NCHE222

Semester 2

NQF Level: 6

Title/ Titel: Organic Chemistry II / Organiese Chemie II

Module outcomes / Module uitkomst:

After completion of the module NCHE222, the student should demonstrate:

- detailed knowledge and a clear understanding of models used to present atoms and molecules as well as the properties, reactions and mechanisms pertaining to aromatic chemistry;
- a clear understanding of prevalent schools of thought that determined the progress within the field of molecular models;
- the ability to select, implement and evaluate the correct mechanism to demonstrate the possible progression of specific aromatic based reactions;
- the ability to effectively use appropriate laboratory skills to synthesize and purify specific compounds;
- the ability to solve a multi-step reaction using suitable reagents and products to ensure the manufacture of the desired compound.
- have a sense of responsibility for fellow humans and the environment in scientific investigations while acting in accordance with the code of conduct relevant to chemistry.

Na voltooiing van die module NCHE222, behoort die student:

- gedetailleerde kennis en 'n duidelike begrip van die modelle wat gebruik word om atome en molekules voor te stel, sowel as die eienskappe, reaksies en meganismes wat van toepassing is op aromatiese chemie, te hê;
- die huidige denkskole wat die ontwikkeling binne die veld van molekulêre modelle bepaal het, te verstaan;
- die korrekte meganisme te kan kies, toe te pas en te evalueer om sodoende die maatskappij se vooruitgang van spesifieke aromatiese reaksies weer te gee.
- die toepaslike laboratoriumvaardighede effektief te gebruik om spesifieke verbindinge te vervaardig en te suiwer;
- 'n multi-stap reaksie te kan weergee deur die nodige reagense en produkte aan te dui om die vervaardiging van die korrekte produk te verseker;
- 'n verantwoordelike gevoel in sy chemiese ondersoek vir sy medemens en die omgewing te hê, terwyl hy volgens die gedragskode van chemici optree

Module code: CHEM311

Semester 1

NQF Level: 7

Title/ Titel: Analytical Methods III / Analitiese Metodes III

Module outcomes / *Module uitkomst:*

After completion of the module CHEM311, the student should be able:

- to demonstrate integrated knowledge regarding molecular spectroscopic techniques, separation-, thermal-, and electrochemical methods ;
- to derive the structure and properties of chemical substances from experimental measurements;
- to demonstrate and understanding of analytical techniques generally used in characterising chemical compounds; and
- to select and apply a range of analytical techniques to execute chemical analyses, and evaluate, critically reflect on and address the results in a justifiable manner by applying evidence-based and theory-driven arguments;
- be able to address his/her learning needs in a self-addressed manner;
- to demonstrate the ability to take decisions and act ethically and professionally within a supported environment.

Na voltooiing van die module CHEM311, behoort die student:

- in staat te wees om geïntegreerde kennis met betrekking tot molekulêre spektroskopiese tegnieke, skeidings-, termiese- en elektrochemiese metodes te kan demonstreer;
- die strukture en eienskappe van chemiese stowwe uit eksperimentele metings af te lei;
- begrip te hê van analitiese tegnieke wat algemeen in die karakterisering van chemiese verbindinge gebruik word; en
- verskeie analitiese tegnieke te kan selekteer en toe te pas om chemiese analises uit te voer, en die analitiese resultate te evalueer, krities oor te besin en op 'n verantwoordbare wyse aan te spreek d.m.v bewysgebaseerde en teoriegedrewe argumente;
- in staat te wees om sy/haar leerbehoefte op 'n selfgerigte wyse aan te spreek;
- die vermoë te kan demonstreer om besluite te neem en eties en professioneel binne 'n ondersteunde omgewing op te tree

Module code: CHEN312	Semester 1	NQF Level: 7
Title / Titel: Physical Chemistry III / Fisiese Chemie III		
<p>Na voltooiing van die CHEN312 module, behoort die student te demonstreer dat:</p> <ul style="list-style-type: none"> • <i>hy/sy oor die kennis, insig en verstaan beskik om (i) inleidende kwantumchemiese beginsels in berekeninge toe te pas, (ii) die ontstaan van vibrasie-, rotasie- en vibrasie-rotasie-spektra te verklaar en molekulêre groothede en spektroskopiese konstantes uit die spektra te bereken, (iii) termodinamiese groothede vir reële (nie-ideale) gasse te bereken deur tabelwaardes te gebruik in vergelykings wat op afwykings van die ideale gas gebaseer is, (iv) die Debye-Hückel-teorie en verwante teorieë aan te wend om termodinamiese groothede vir reële (nie-ideale) oplossings te bepaal, en (v) kinetiese groothede en aktiveringsparameters, vir reaksies van 'n meer komplekse aard, numeries en grafies te bepaal;</i> • <i>hy/sy die vermoë beskik om krities verskeie bronne van kennis soos boeke en die internet binne die veld van die fisiese chemie te raadpleeg, met spesifieke verwysing na bogenoemde velde, ten einde 'n kritiese oorsig en evaluering van die kennis te bekom met die oog op die verkryging van 'n meer in diepte verstaan en waardering van die teorie en toepassing;</i> • <i>hy/sy, onder gepaste toesig, beskik oor eksperimentele praktyk deur die nodige prosedures en metodes te volg ten einde eksperimente effektief uit te voer en te voltooi (verwant aan bogenoemde velde), effektief te rapporteer oor die eksperimentele bevindinge, en om relevante konklusies te onttrek soos versoek;</i> • <i>hy/sy oor probleemoplossing vaardighede beskik met betrekking tot die koppelvlak tussen teorie en praktyk en te kan analiseer en krities te besin oor die uitslag/resultaat;</i> • <i>hy/sy 'n verstaan en waardering het van die etiese en professionele gedrag wat van 'n professionele chemikus verwag word asook die etiese toepassing van die fisiese chemie</i> 		
Module code: CHEN321	Semester 2	NQF Level: 7
Title/ Titel: Inorganic Chemistry III / Anorganiese Chemie III		
<p>Module outcomes / Module uitkomst:</p> <p>On successful completion of CHEN321 the student should be able to demonstrate the following:</p> <ul style="list-style-type: none"> • integrated knowledge and the ability to apply and evaluate models used to present structure and bonding of atoms and molecules as well as the reaction properties pertaining to the chemistry of the transition metals, actinides and lanthanides; • the ability to select, evaluate and apply different chemical and atomic properties, as well as to predict important chemical reactions of transition metals, actinides and lanthanides from basic principles, the use of Pourbaix diagrams and Ellingham diagrams; • the ability to identify, analyse and critically reflect on complex discipline-specific problems and to suggest evidence-based solutions through theory-driven arguments; • the ability to effectively use appropriate laboratory skills and practical techniques to synthesize and purify specific transition metal complexes and oxides; • the ability to solve a multi-step reaction using suitable reagents and products to ensure the manufacturing of the desired compound, while planning and executing a work schedule; • the ability to manage experimental work in an unfamiliar context in order to solve a contextual problem; 		

- produce accurate and coherent written accounts of gathered information with an understanding of and respect for intellectual property conventions, copyright and rules on plagiarism.

Na suksesvolle voltooiing van CHEN321, behoort die student die volgende te kan demonstreer:

- *geïntegreerde kennis en die vermoë om modelle voor te stel en te gebruik om struktuur en binding van atome en molekule asook die reaksie eienskappe wat verband hou met die chemie van die oorgangsmetale, aktiniede en lantaniede te evalueer;*
- *die vermoë om verskillende chemiese en atoom-eienskappe kies, te evalueer en toe te pas, asook om belangrike chemiese reaksies van oorgangsmetale, aktiniede en lantaniede vanaf basiese beginsels te voorspel, die gebruik van Pourbaix diagramme en Ellingham-diagramme;*
- *die vermoë om te identifiseer, te analiseer en krities te besin oor komplekse dissipline-spesifieke probleme en om bewysgebaseerde oplossings deur middel van teoriegedrewe argumente voor te stel;*
- *die vermoë om gepaste laboratorium vaardighede en praktiese tegnieke effektief te kan gebruik om spesifieke oorgangsmetaalkomplekse en oksiede te sintetiseer en te suiwer;*
- *die vermoë om 'n multi-stapreaksie uit te voer deur van geskikte reagense en produkte gebruik te maak en sodoende te verseker dat die gewenste verbinding vervaardig word, terwyl 'n werkskedule beplan en uitgevoer word;*
- *die vermoë om eksperimentele werk in 'n onbekende konteks te bestuur ten einde 'n kontekstuele probleem op te los;*
- *produseer akkurate en samehangende geskrewe verslae van versamelde inligting met 'n begrip van en respek vir intellektuele eiendom konvensies, kopiereg en reëls oor plagiaat*

Module code: CHEN322

Semester 2

NQF Level: 7

Title / Titel: Organic Chemistry III / Organiese Chemie III

Module outcomes / Module uitkomst:

After completion of the module CHEN322, the student should demonstrate:

- integrated knowledge and understanding of the theory of the following: aromatic heterocyclic chemistry, stereochemistry, chemistry of the carbonyl compound and rearrangement reactions;
- an ability to assimilate multiple sources of knowledge such as books, general scientific journals and the internet within the field of organic chemistry, and critically evaluate and review that knowledge to deepen the understanding of organic chemistry;
- supervised experimental skills by performing a number of synthesis and analytical tasks, to effectively execute a planned research design, communicate findings and conclusions by means of a written report in a scientific manner;
- the ability to identify, demarcate, analyse, critically reflect on and effectively solve problems in organic chemistry by using appropriate methods;
- an understanding of the ethical and professional conduct required of a professional chemist.

Na voltooiing van die module CHEN322, behoort die student:

- *'n geïntegreerde kennis en begrip van die teorie van die volgende te hê: aromatiese heterosikliese chemie, stereochemie, chemie van die karbonielverbinding en herrangskikkingsreaksies;*

<ul style="list-style-type: none"> • <i>die vermoë ontwikkel om 'n verskeidenheid bronne van kennis soos boeke, algemene wetenskaplike tydskrifte en die internet binne die veld van organiese chemie te assimileer en krities die inligting te evalueer en te hersien om sodoende die begrip van organiese chemie te verdiep;</i> • <i>onder toesig navorsingsvaardighede te kan demonstreeur deur 'n aantal sintese- en analitiese take te verrig, effektief 'n beplande navorsingsontwerp uit te voer en die resultate en gevolgtrekkings m.b.v. 'n wetenskaplik geskrewe verslag te kommunikeer;</i> • <i>die vermoë te hê om probleme in organiese chemie met toepaslike metodes te identifiseer, af te baken, te analiseer, krities te bedink en dan effektief op te los;</i> • <i>'n begrip te hê van die etiese en professionele gedrag wat van 'n professionele chemikus verwag kan word.</i> 		
Module code: MCHE322	Semester 2	NQF Level: 6
Title / Titel: Inorganic Chemistry II		
At the end of this module, students should be able to:		
<ul style="list-style-type: none"> • Write the names of coordination compounds following the IUPAC system; • Explain isomerism in coordination compounds; • Describe bonding in octahedral, tetrahedral and square planer coordination compounds using the valence bond theory; • Describe the bonding in octahedral, tetrahedral and square planer coordination compounds using the crystal field theory; • Predict the magnetic properties, electronic absorption spectra, structural and thermodynamic parameters of coordination compounds using the crystal field theory; • Work out the bonding in coordination compounds using the valence bond and molecular orbital theories; • Explain in practical experiments better principles and concepts introduced in the theory course; • Use various Laboratory techniques required for the practice of chemistry (measurement of mass, volume, temperature, etc) • Make accurate observations and measurements and record them • Collect, analyse and present data (i.e write reports of practical work carried out); • Handle and use scientific equipment; • Interpret spectra data (both ultraviolet and infrared). 		

NAS.2.8.7 ZOOLOGY / DIERKUNDE

Module code: DRKS111	Semester 1	NQF Level: 5
Title / Titel: Invertebrates / Invertebrate		
Module outcomes / <i>Module uitkomst</i> :		
On completion of the module the student should be able to demonstrate:		
<ul style="list-style-type: none"> • A basic knowledge and informed understanding of the systematics and classification of animals, form and function of animals in general and of invertebrates in particular, as well as being able to identify and classify these animals and indicate phylogenetic relationships. • An ability to distinguish between examples of invertebrates and to sort them in taxonomic and phylogenetic frameworks. • The ability to differentiate between animals based on their hierarchical organisation, complexity and body plan as well as apply this to demonstrate relationships between groups of invertebrates/taxa. 		

- The ability to explain what a species is and give an overview of the different species concepts.
- An awareness of the economic importance of invertebrates as a source of food, as parasites of humans, animals and plants, or as biological or mechanical carriers of pathogens.
- The ability to report on their skills in respect of the use of microscopes, dichotomous keys and the accessing of sources; with a respect for conventions around intellectual property, copyright and plagiarism.
- The ability to account for the role of humans in conservation of the environment and in particular invertebrate biodiversity.

Na suksesvolle voltooiing van hierdie module sal die student:

- *Basiese kennis en ingeligte begrip hê van sistematiek en die klassifikasie van diere, vorm en funksie van diere in die algemeen en van ongewerweldes in die besonder, asook as in staat wees om hierdie diere te identifiseer, te klassifiseer en te dui op filogenetiese verwantskappe.*
- *Die vermoë toon om te onderskei tussen voorbeelde van ongewerweldes en om hulle te sorteer in taksonomiese en filogenetiese raamwerke.*
- *Aantoon dat hy/sy oor die vermoë beskik om te onderskei tussen diere op grond van hul hiërargiese organisasie, kompleksiteit en liggaamsplan asook hoe om hierdie inligting toe te pas om verhoudings tussen groepe ongewerweldes/taksons te demonstreer.*
- *Kan verduidelik wat 'n spesie is en 'n oorsig kan bied van die verskillende spesiekonsepte.*
- *'n Bewustheid hê van die ekonomiese belangrikheid van ongewerweldes as 'n bron van voedsel, parasiete van mense, diere en plante, of as biologiese of meganiese draers van patogene.*
- *In staat wees om verslag te doen oor vaardighede ten opsigte van die gebruik van mikroskope, digotome sleutels en die ontsluiting van bronne; met respek vir konvensies rondom intellektuele eiendom, kopiereg en plagiaat.*
- *Die vermoë hê om rekenskap te gee van die rol van die mens in die bewaring van die omgewing en in die besonder invertebraatbiodiversiteit.*

Module code: DRKS121

Semester 2

NQF Level: 5

Title Titel: Chordates / Chordata

Module outcomes / Module uitkomst:

On completion of the module the student should be able to demonstrate:

- An informed understanding of the different aspects of form and function of deuterostome animals, and southern African chordate diversity.
- Ability to select and apply basic processes of analysis, synthesis and evaluation to unlock existing and additional knowledge.
- Ability to work with a microscope and obtain in-focus images at a required magnification.
- The skill and ability to interpret a microscope image and prepare annotated drawings.
- The ability to report on their skills in respect of field identification guides and keys to identify chordates to the required taxonomic level.
- The ability to account for the role of humans in conservation of the environment and in particular higher invertebrate and Chordate biodiversity.
- Awareness of ethical issues related to the use and study of higher invertebrates and Chordata.

Na suksesvolle voltooiing van hierdie module sal die student die volgende kan demonstreer:

- *Ingeligte begrip van die verskillende aspekte van sistematiek, klassifikasie van diere, vorm en funksie van deuterostoom diere in die algemeen en suider-Afrikaanse chordaat diversiteit.*
- *Die vermoë om basiese prosesse van analise, sintese en evaluering te gebruik om bestaande en addisionele inligting te ontsluit.*
- *Die vaardigheid en vermoë om mikroskoopbeelde te interpreteer en benaamde tekeninge te maak.*
- *Die vermoë om vaardigheid en toon te stel rakende die gebruik van veld-identifikasiegidse en sleutels om Chordate tot die nodige taksonomiese vlakke te identifiseer.*
- *Die vermoë om rekenskap te gee van die rol van die mens in die bewaring van die omgewing en in die besonder hoer invertebraat- en chordaatbiodiversiteit.*
- *Bewustheid van etiese aspekte rakende die benutting en studie van hoër invertebrate en Chordata*

Module code: DRKN211

Semester 1

NQF Level: 6

Title Titel. Developmental Biology / Ontwikkelingsbiologie

Module outcomes / Module uitkomst:

On completion of the module the student should be able to demonstrate:

- A detailed knowledge of chordate embryology, the principles of evolutionary theory and basic cytogenetics as well as understand the origin and development of knowledge within the field of embryology, evolutionary theory and cytogenetics.
- An ability to evaluate, select and apply appropriate methods, procedures and techniques in processes of investigation chordate embryology; investigating opinions, approaches and principles of evolutionary theory; and understand applications in the field of cytogenetics.
- An ability to identify and evaluate problems in unfamiliar contexts, gathering evidence appropriate to the field of developmental biology.
- An understanding of the ethical implications of aspects typical of the field of developmental biology, such as research on fetuses, abortion, the extent of genetic manipulation of man and animal and the relationship between religion and evolution as well as an taking responsibility of their own actions pertaining a scientist-in-training: integrity in all aspects of their studies.
- An ability to evaluate different sources of information and to present and communicate complex information reliably and coherently.
- An understanding of the relationships between systems of developmental biology.
- An ability to evaluate his/her own performance against given criteria.

Na suksesvolle voltooiing van hierdie module sal die student:

- *Demonstreer dat hy/sy oor gedetailleerde kennis van chordaatembrilogie, die beginsels van evolusieteorie en basiese sitogenetika beskik asook die oorsprong en ontwikkeling van die kennis in die veld van embriologie, evolusieteorie en sitogenetika verstaan.*
- *Toepaslike metodes, prosedures en tegnieke in die ondersoekproses van chordaatembrilogie evalueer, selekteer en toepas; opinies, benaderings en beginsels van evolusieteorie ondersoek; toepassings in die veld van sitogenetika begryp.*

- *Probleme in onbekende konteks kan identifiseer en evalueer, en bewyse van toepassing in die veld van ontwikkelingsbiologie, kan insamel.*
- *'n Begrip toon vir die etiese implikasies van aspekte wat tipies is vir die veld van ontwikkelingsbiologie, soos navorsing op fetusse, abortsie, die omvang van genetiese manipulasies op mens en dier en die verhouding tussen religie en evolusie asook om verantwoordelikheid te aanvaar vir sy/haar eie aksies met betrekking tot wetenskaplike-in-opleiding: integriteit in alle aspekte van hulle studie.*
- *Verskillende inligtingsbronne kan evalueer en komplekse inligting betroubaar en koherent kan kommunikeer.*
- *Begrip toon vir die verwantskappe tussen stelsels in ontwikkelingsbiologie.*
- *Sy/haar eie vermoë aan die hand van gegewe kriteria kan meet.*

Module code: DRKS221

Semester 2

NQF Level: 6

Title / Titel: Comparative Animal Physiology / Vergelykende dierfisiologie

Module outcomes / Module uitkomst

On completion of the module the student should be able to demonstrate:

- A focussed knowledge of the fundamental theory of Animal Physiology.
- An understanding of the crucial relationships between environment, form and function and its influence on the physiology of animals.
- The ability to use figures, tables and graphs to explain and supplement various aspects of Animal Physiology.
- The ability to identify key differences in certain physiological processes among animals from different modes of life (aquatic vs. terrestrial).
- Awareness of the scope of ethical and value systems when studying physiological processes in animals.
- The ability to follow instructions to perform experimentation on animals or animal systems to demonstrate a particular physiological process.

Na suksesvolle voltooiing van hierdie module sal die student die volgende kan demonstreer:

- *Gefokusde kennis van die fundamentele teorie van Dierfisiologie.*
- *'n Begrip van die noodsaaklike verbande tussen omgewing, vorm en funksie en die invloed daarvan op fisiologie van diere.*
- *Die vermoë om figure, tabelle en grafieke te gebruik om die verskeie aspekte van Dierfisiologie te verduidelik en aan te vul.*
- *Die vermoë om sleutelverskille in sekere fisiologiese prosesse te identifiseer tussen diere van verskillende lewenstipe (akwaties vs. terrestrieel).*
- *Bewustheid van die omvang van etiese en waardestelsels in die studie van fisiologiese prosesse in diere. ontwikkeling biologie*
- *Die vermoë om instruksies te volg om eksperimente op diere uit te voer om 'n spesifieke fisiologiese proses te demonstreer.*

Module code: DRKS311

Semester 1

NQF Level: 7

Title / Titel: Ecology / Ekologie

Module outcomes / Module uitkomst

On completion of the module the student should be able to demonstrate:

- Demonstrate how knowledge and theories within the field of aquatic and terrestrial ecology relate to knowledge within other fields with a view to understand the interrelatedness thereof.

- Integrate knowledge of the principles of aquatic and terrestrial ecology and be able to evaluate knowledge and explanations provided in the field of ecology.
- Identify the basic research methodologies relevant to terrestrial and aquatic ecology, select appropriate methods and apply a range of methods used in ecological studies.
- Demonstrate an advanced ability to effectively apply practical skills in research projects to survey and critique aquatic and terrestrial ecosystem health and diversity with a view to suggest interventions and improvements in management systems.
- Analyse and evaluate academic literature to demarcate a researchable problem within the field of ecology and specify an appropriate scientific method that can be used to address the identified problem.
- Reflect on the values, ethical conduct and justifiability of decisions appropriate to ecological studies.
- Produce and communicate accurately and coherently both verbally and in written reports on academic principles in ecology and on ecological research projects.

Third year Zoology students registered for DRKS311 and DRTS311 must attend a compulsory field trip during March/April (that can include the recess time). The report generated from results obtained during the field trip will contribute to the participation mark. No excuses for absence from the field trip will be accepted, except in the event of illness in which case a medical certificate must be presented.

Na suksesvolle voltooiing van hierdie module sal die student die volgende kan demonstreer:

- *Kennis en teorie in die veld van akwatiese en terrestriële ekologie en die verband met kennis in ander velde en die interafhanklikheid tussen stelsels.*
- *Geïntegreerde kennis van die beginsels van akwatiese en terrestriële ekologie en in staat wees om kennis en verduidelikings wat in ekologie verskaf word, te evalueer.*
- *Die vermoë om basiese navorsingsmetodologie wat relevant is tot terrestriële en akwatiese ekologie te identifiseer, toepaslike metodes te selekteer en 'n reeks metodes toe te pas in ekologiese studies.*
- *Gevorderde vermoë om praktiese vaardighede toe te pas in navorsingsprojekte en opnames wat daarop gemik is om akwatiese- en terrestriële ekostelselgesondheid te evalueer, en ingrepe en verbeterings voor te stel.*
- *Die vermoë om akademiese literatuur te analiseer en te evalueer om 'n navorsingsvrae in die veld van ekologie te ontwikkel en om toepaslike wetenskaplike metodes voor te stel om hierdie vrae aan te spreek.*
- *Etiese waardes en gedrag en regverdigbaarheid van toepaslike besluite in die studie van ekologie.*
- *Die vermoë om akademiese beginsels in ekologie asook oor navorsingsprojekte, akkuraat en samehangend te kommunikeer, beide in mondelinge voordragte en skriftelike verslae.*

Derdejaar Dierkunde studente wat vir DRKS311 en DRTS311 registreer moet 'n verpligte veldekskursie gedurende Maart/April (dit kan die reses insluit) bywoon. Die resultate wat verkry word, moet in verslagvorm ingehandig word en dit sal bydra tot die deelnamepunt. Geen verskonings sal aanvaar word nie, behalwe in die geval van siekte in welke geval 'n mediese sertifikaat voorgelê moet word.

Module code: DRKN321	Semester 2	NQF Level: 7
Title / Titel: Animal Parasitology / Dier Parasitologie		
<p>Module outcomes / <i>Module uitkomst</i></p> <p>After completion of this module, the student is expected to demonstrate the following:</p> <ul style="list-style-type: none"> • Integrated knowledge and understanding of, as well as an ability to correctly evaluate and apply concepts, facts and principles to different areas of specialization including the classification, life cycles, biology, pathogenesis, epidemiology immunology, diagnosis and treatment in the field of parasitology and an understanding of how the knowledge relates to other fields or practices such as hygiene with a view to control pathogenesis caused by the parasites • Understanding of contested knowledge with regard to epidemiology within the field of parasitology and a critical evaluation of the applicability of aforementioned principles and theories to this field. • Ability to select, evaluate and apply a range of different but appropriate theories and scientific methods of enquiry (qualitative, as well as quantitative), to do focused research and resolve problems that will effect change within practice of parasitology. • Reflection on all values, ethical conduct and justifiable decision making when people are in involved studies regarding parasitology. <p><i>Na voltooiing van hierdie module word van die student verwag om die volgende te demonstreer:</i></p> <ul style="list-style-type: none"> • <i>Kennis en begrip te integreer, die vermoë demonstreer om konsepte, feite en beginsels van toepassing op verskillende gebiede van spesialisasie insluitende klassifikasie, lewensiklusse patogenese, epidemiologie immunologie, diagnose en behandeling in die veld van parasitologie te maak, dat hy/sy begryp van hoe om die kennis in verband te bring met ander velde of praktyke soos higiëne met die oog daarop om die patogenese wat deur die parasiete veroorsaak word te beheer.</i> • <i>Betwiste kennis met betrekking tot epidemiologie binne die veld van parasitologie in ag te neem en krities te evalueer tydens die toepassing van reeds genoemde beginsels en teorieë met betrekking tot parasitologie</i> • <i>Die vermoë om verskillende maar toegepaste teorieë en wetenskaplike metodes van inligtingverkryging te selekteer (kwalitatief sowel as kwantitatief) om gefokusde navorsing te doen en probleme op te los wat tot verandering in uitvoering van die praktyk sal lei</i> <p><i>Dat hy/sy oor alle waardes rakende dierparasitologie kan reflekteer, aan etiese beginsels voldoen en regverdigbare besluite maak wanneer mense betrokke is tydens toepassing van geskikte praktyke met betrekking tot parasitologie.</i></p>		
Module code: DRKS322	Semester 2	NQF Level: 7
Title / Titel: Ethology / Etologie		
<p>Module outcomes / <i>Module uitkomst</i>:</p> <p>After completion of the DRKS322 module, the student should demonstrate:</p> <ul style="list-style-type: none"> • An integrated knowledge and critical understanding of ethology and associated theories. • The ability to locate and interrogate multiple sources of knowledge related to ethology. • The ability to evaluate and contextualize the knowledge and accompanying insights, as well as integrating this with the field project. 		

- The ability to correctly select and apply knowledge and skills to make use of appropriate methods and techniques relevant to ethology.
- The ability to initiate, plan, develop and execute a project on the behavior of any wild animal, and integrate the data and observations with the relevant ethological theories.
- Presentation skills by presenting and discussing research.
- The ability to identify and formulate the ethical considerations of working and research on wild animal behaviour.

Na voltooiing van die module moet die student die volgende demonstreer:

- *’n Grondige kennis en kritiese begrip van etologie.*
- *Die vermoë om verskeie inligtingsbronne oor etologie te ontsluit.*
- *Die vermoë om hierdie kennis en insigte te kan evalueer en kontekstualiseer, en om dit te integreer met die veldprojek.*
- *Die vermoë om te besluit welke tegniek of vaardigheid in ’n spesifieke situasie toegepas behoort te word in die konteks van etologie.*
- *Voordragvaardighede om die bevindinge van projekte voor te dra.*
- *Die vaardigheid om om die etiese aspekte relevant tot werk en navorsing oor die gedrag van wilde diere te identifiseer en formuleer.*

Module code: DRTS311

Semester 1

NQF Level: 7

Title / Titel: Ecology: Tourism / Ekologie: Toerisme

Module outcomes / Module uitkomst:

On completion of the module the student will be able to:

- Demonstrate how knowledge and theories within the field of aquatic and terrestrial ecology relate to knowledge within other fields with a view to understand the interrelatedness thereof.
- Integrate knowledge of the principles of aquatic and terrestrial ecology and be able to evaluate knowledge and explanations provided in the field of ecology.
- Identify the basic research methodologies relevant to terrestrial and aquatic ecology, select appropriate methods and apply a range of methods used in ecological studies.
- Demonstrate an advanced ability to effectively apply practical skills in research projects to survey and critique aquatic and terrestrial ecosystem health and diversity with a view to suggest interventions and improvements in management systems.
- Analyse and evaluate academic literature to demarcate a researchable problem within the field of ecology and specify an appropriate scientific method that can be used to address the identified problem.
- Reflect on the values, ethical conduct and justifiability of decisions appropriate to ecological studies.
- Produce and communicate accurately and coherently both verbally and in written reports on academic principles in ecology and on ecological research projects.

Third year Zoology students registered for DRKS311 and DRTS311 must attend a compulsory field trip during March/April (that can include the recess time). The report generated from results obtained during the field trip will contribute to the participation mark. No excuses for absence from the field trip will be accepted, except in the event of illness in which case a medical certificate must be presented.

Na suksesvolle voltooiing van hierdie module sal die student die volgende kan demonstreer:

- *Kennis en teorie in die veld van akwatiese en terrestriële ekologie en die verband met kennis in ander velde en die interafhanklikheid tussen stelsels.*
- *Geïntegreerde kennis van die beginsels van akwatiese en terrestriële ekologie en in staat wees om kennis en verduidelikings wat in ekologie verskaf word, te evalueer.*
- *Die vermoë om basiese navorsingsmetodologie wat relevant is tot terrestriële en akwatiese ekologie te identifiseer, toepaslike metodes te selekteer en 'n reeks metodes toe te pas in ekologiese studies.*
- *Gevorderde vermoë om praktiese vaardighede toe te pas in navorsingsprojekte en opnames wat daarop gemik is om akwatiese- en terrestriële ekostelselgesondheid te evalueer, en ingrepe en verbeterings voor te stel.*
- *Die vermoë om akademiese literatuur te analiseer en te evalueer om 'n navorsingsvrae in die veld van ekologie te ontwikkel en om toepaslike wetenskaplike metodes voor te stel om hierdie vrae aan te spreek.*
- *Etiese waardes en gedrag en regverdigbaarheid van toepaslike besluite in die studie van ekologie.*
- *Die vermoë om akademiese beginsels in ekologie asook oor navorsingsprojekte, akkuraat en samehangend te kommunikeer, beide in mondelinge voordragte en skriftelike verslae.*

Derdejaar Dierkunde studente wat vir DRKS311 en DRTS311 registreer moet 'n verpligte veldekskursie gedurende Maart/April (dit kan die reses insluit) bywoon. Die resultate wat verkry word, moet in verslagvorm ingehandig word en dit sal bydra tot die deelnamepunt. Geen verskonings sal aanvaar word nie, behalwe in die geval van siekte in welke geval 'n mediese sertifikaat voorgelê moet word.

NAS.2.8.8 ECONOMICS / EKONOMIE

Module code: ECON112	Semester 1	NQF Level: 5
Title/ Titel: Basic Micro Economics / Basiese Mikro-ekonomie		
Module outcomes / Module uitkomstes:		
On completion of the module, the student should:		
<ul style="list-style-type: none"> • demonstrate a sound knowledge of the concept microeconomics with reference to individual demand, individual supply, consumption and production, the relevant price elasticities and microeconomic equilibrium; • identify different market structures; • analyse and apply the theory of production; • demonstrate an understanding of the economic problem and how different economic systems try to solve it; • Participate effectively in groups. 		
<i>Met voltooiing van die module behoort die student die volgende te demonstreer:</i>		
<ul style="list-style-type: none"> • <i>geïntegreerde kennis van die konsep mikro-ekonomie met verwysing na individuele vraag, individuele aanbod, verbruik en produksie, die relevante pryselasticiteite en mikro-ekonomiese ewewig te demonstreer.</i> • <i>identifiseer verskillende markstrukture;</i> • <i>ontleed en die teorie van produksie en dit te kan toepas;</i> • <i>demonstreer 'n begrip van die ekonomiese probleem en hoe verskillende ekonomiese stelsels probeer om dit op te los.</i> • <i>Neem effektief deel in groepe</i> 		

Method of delivery: Full time

Assessment modes:

The participation mark is calculated using formal formative assessment activities that could include, but might not be limited to the following:

Class tests, principle tests, assignments, e-assignments/quizzes (utilising the e-learning platform of NWU) and scheduled tests.

The weightings will be communicated to students in a module overview document.

A participation mark of 35% allows a student admission to the final examination (summative assessment). Additional proof of participation requirements may also be set out in the module study guide, which must also be satisfied before exam admission is allowed.

The final module mark is calculated using the following weightings:

Participation mark (50%); and

Final examination mark (50%).

The examination subminimum requirement is 35%.

Module code: ECON122

Semester 2

NQF Level: 5

Title / Titel: Introduction to Macroeconomics / *Inleiding tot Makro-ekonomie*

Module outcomes / Module uitkomst:

On completion of the module, the student should:

- demonstrate integrated knowledge of ways that fiscal and monetary policy measures are implemented to achieve specific economic objectives;
- apply the above outcome to the South African situation;
- demonstrate a sound knowledge of the concept macro-economics, with regard to macroeconomic supply, macro-economic demand and macro-economic equilibrium;
- show an understanding about how the government, through its economic policy, can influence major economic problems;
- explain the causes and suggest policy with regard to inflation, unemployment and economic growth;
- poses knowledge of the simple macroeconomic model;
- participate effectively in groups

Met voltooiing van die module behoort die student die volgende te demonstreer:

- *geïntegreerde kennis van maniere waarop fiskale en monetêre beleid in werking gestel word om spesifieke ekonomiese doelwitte te bereik;*
- *om die bogenoemde uitkomst van toepassing te maak op die Suid-Afrikaanse situasie;*
- *grondige kennis van die konsep makro-ekonomie, ten opsigte van makro-ekonomiese aanbod, makro-ekonomiese vraag en makro-economie ewewig te demonstreer;*
- *begrip te toon oor hoe die regering, deur sy ekonomiese beleid, groot ekonomiese probleme kan beïnvloed;*
- *verduidelik die oorsake van en stel beleid voor ten opsigte van inflasie, werkloosheid en ekonomiese groei;*
- *kennis van die eenvoudige makro-ekonomiese model weer te gee;*
- *neem effektief deel in groepe*

Module code: ECON211

Semester 1

NQF Level: 6

Title / Titel: Macroeconomics / *Makro- ekonomie*

Module outcomes / *Module uitkomst:*

On completing this module you should be able:

- to analyse the interrelationships in macroeconomics between different economic variables in an open economy;
- to evaluate the effect of various policy steps on the functioning of the economy in the long and short run;
- to identify different policy measures to identify macroeconomic problems;
- to explain how these measures may be applied.

Na afhandeling van hierdie module behoort u in staat te wees om:

- *die interverwantskappe in die makro-ekonomie tussen verskillende ekonomiese veranderlikes in 'n oop ekonomie te ontleed;*
- *die uitwerking van verskeie beleidstappe op die funksionering van die ekonomie op sowel die lang- as die korttermyn te beoordeel;*
- *verskillende beleidsmaatstawwe vir makro-ekonomiese probleme te identifiseer;*
- *verduidelik hoe dit toegepas kan word.*

NAS.2.8.9 ECONOMICS: RISK MANAGEMENT / EKONOMIE EN RISIKOBESTUUR

Module code: EKR211	Semester 1	NQF Level: 6
Title / Titel: Introduction to risk management / Inleiding tot Risikobestuur		
<p>Module outcomes / <i>Module uitkomst:</i></p> <p>After completion of this module, the student should be able to:</p> <ul style="list-style-type: none"> • demonstrate a clear understanding of what risk entails and how to manage risk strategically in a corporate environment in South Africa; • explain why risk management plays an important role in the business environment; • identify and distinguish between various types of risks; • demonstrate both theoretical knowledge and practical application of the risk management process, i.e. the identification, evaluation and control of risk in a variety of scenarios; and • demonstrate a clear understanding of the various forms of risk financing strategies, the cost associated with the different strategies and the appropriateness thereof for different risks. <p><i>Na afhandeling van hierdie module behoort u in staat te wees om:</i></p> <ul style="list-style-type: none"> • <i>'n deeglike kennis te demonstreeer van wat risiko behels asook hoe om risikos strategies in 'n korporatiewe omgewing in Suid-Afrika te bestuur;</i> • <i>te verduidelik waarom risikobestuur 'n belangrike rol in die besigheidsomgewing speel;</i> • <i>verskeie tipes risiko's te identifiseer en tussen hulle te onderskei;</i> • <i>beide teoretiese kennins en toepassings van die risikobestuursproses te demonstreeer , wat insluit die identifisering, evaluering en kontrolering van risiko in verskeie omstandighede;</i> • <i>deeglike begrip te demonstreeer van verskeie vorme van risiko finansieringstrategieë, die koste verbonde aan hierdie strategieë en die toepaslikheid daarvan op verskeie risiko's.</i> 		
Module code: EKR221	Semester 2	NQF Level: 6
Title / Titel: Investment management / Beleggingsbestuur		
<p>Module outcomes / <i>Module uitkomst:</i></p> <p>After completion of this module, the student should be able to:</p> <ul style="list-style-type: none"> • demonstrate a solid knowledge of the general principles of investment management; • explain the required rate of return as investment criterion; • discuss the fundamental principles of investment in terms of risk/return and the time value of money; • explain diversification; • discuss and analyse the investment management process; • discuss the organisation and functioning of security markets; 		

- distinguish between and evaluate the different investment theories;
- discuss valuation principles and practices in investment management;
- explain and discuss fundamental analysis; and
- discuss portfolio management and portfolio evaluation from the perspective of the investment manager.

Na afhandeling van hierdie module behoort u in staat te wees om:

- *die vereiste opbrengskoers as beleggingskriterium te verduidelik;*
- *die fundamentele beginstels van belegging in die lig van risiko/opbrengs en die tydwaarde van geld te ontleed;*
- *diversifisering te verduidelik;*
- *die beleggingsbestuursproses te bespreek en te analiseer;*
- *die organisasie en funksionering van sekuriteite-markte te bespreek;*
- *die verskillende beleggingsteorieë te onderskei en te evalueer;*
- *waardasiebeginsels en –praktyke in beleggingsbestuur te bespreek;*
- *fundamentele ontleding te bespreek;*
- *tegniese ontleding te done;*
- *en portefeuljebestuur en portefeulje-evaluering vanuit die oogpunt van die beleggingsbestuurder te bespreek en te analiseer*

Module code: EKR311

Semester 1

NQF Level: 7

Title / Titel: Bank Risk Management / Bankrisikobestuur

Module outcomes / *Module uitkomst:*

On completing this module you should be able:

- to demonstrate a sound and systematic knowledge and understanding of how the Assets and Liabilities Committee (ALCO) manage their assets and liabilities to address banking risks, the role that the management of these financial assets and liabilities play in the South African economy, as well as to address the financial and other related risks in a financial institution;
- to demonstrate well developed skills to solve problems by strategic management of the process of minimising financial risks; of maximising the interest income and equity of financial institutions, and show thorough understanding of the regulatory environment in which banks operate;
- to use individual and group methods to communicate information effectively, coherently and in appropriate format.

Na afhandeling van hierdie module behoort u in staat te wees om:

- *'n deeglike en sistematiese kennis en begrip te demonstreer van die manier waarop die Bates-laste-komitee (BALKO) hul bates en laste bestuur om bankrisiko's, die rol wat die bestuur van hierdie finansiële bates en laste in die Suid-Afrikaanse ekonomie speel, asook die finansiële en ander verwante risiko's in 'n finansiële instelling aan te spreek;*
- *goed ontwikkelde probleemoplossingsvaardighede te demonstreer deur die proses van minimalisering van finansiële risiko's strategies te bestuur; die rente-inkomste en ekwiteit van finansiële instellings te maksimaliseer, en deeglike begrip te toon van die regulatiewe omgewing waarin banke funksioneer;*
- *individuele en groepmetodes te gebruik om inligting met betrekking tot bankrisikobestuur doeltreffend, samehangend en in toepaslike formaat oor te dra.*

Module code: EKR321	Semester 2	NQF Level: 7
Title / Titel: Financial Markets / Finansiële Markte		
Module outcomes / <i>Module uitkomst:</i> On completing this module you should be able:		
<ul style="list-style-type: none"> • to demonstrate a well-rounded and systematic knowledge and understanding of the mechanics of the South African Money and Capital Markets, including SAFEX and the Bond Exchange (the Johannesburg Stock Exchange and shares were covered in EKR211), and demonstrate an understanding of and the ability to use the mechanics of the products and instruments, including derivatives used in these markets and the regulatory environment; • to demonstrate the ability to work as an analyst, a market dealer, stock broker and back office official in the banking and treasury environment; • in unfamiliar concrete and abstract scenarios, to apply basic portfolio management using the products and instruments of the above mentioned markets; • to work in groups and/or as an individual and to communicate information effectively in an ethically sound manner, using appropriate information technology. 		
<i>Na afhandeling van hierdie module behoort u in staat te wees om:</i>		
<ul style="list-style-type: none"> • <i>'n afgeronde en sistematiese kennis en begrip van die werking van die Suid-Afrikaanse Geld- en Kapitaalmarkte, met inbegrip van SAFEX en die Effektebeurs (die Johannesburgse Aandelebeurs en aandele is in EKR211 behandel), asook gebruikskennis van die werking van die produkte en instrumente, waaronder afgeleide instrumente, wat in hierdie markte en die regulatiewe omgewing gebruik word te kan demonstreer.</i> • <i>die vermoë te demonstreer om as ontleder, markhandelaar, aandelemakelaar en agterkantoorbeampte in die bank- en tesourie-omgewing te werk.</i> • <i>in ongewone, konkrete en abstrakte scenario's basiese portefeuljebestuur toe te pas deur middel van die produkte en instrumente van die bogenoemde markte;</i> • <i>in groepe en/of as individu te werk en inligting doeltreffend en op 'n eties behoorlike manier met behulp van die toepaslike Inligtingstegnologie oor te dra.</i> 		

NAS.2.8.10 ELECTRONICS

Module code: SFEM 171	Year module 1	NQF Level: 5
Title: Electricity, Magnetism and Circuits		
Module outcomes: The learner should be able to recall the fundamental principles, concepts, facts and applications of Electricity and Magnetism. Demonstrate understanding and application of electric and magnetic field quantities, Maxwell's equations and electromagnetic waves. Demonstrate understanding and application of basic concepts in AC and DC circuit analysis. Demonstrate a hands-on ability to utilise basic electronic equipment with respect to measurement and interpretation of electronic data.		
Module code: SFEM 172	Year module 2	NQF Level: 5
Title: Introduction to Electronics		
Module outcomes: The learner should be able to demonstrate an understanding of the basics and applications of active devices, basic logic concepts and gates. Demonstrate an understanding of circuit theorems, and their application in the analysis of alternating and direct current circuits. Demonstrate a hands-on ability to utilise basic electronic equipment with for measurement and interpretation of electronic data.		

Module code: ELYM 115	Semester 1	NQF Level: 5
Title: Electricity, Magnetism and Circuits		
<p>Module outcomes:</p> <p>The learner should be able to recall the fundamental principles, concepts, facts and applications of Electricity and Magnetism.</p> <p>Demonstrate understanding and application of electric and magnetic field quantities, Maxwell's equations and electromagnetic waves.</p> <p>Demonstrate understanding and application of basic concepts in AC and DC circuit analysis.</p> <p>Demonstrate a hands-on ability to utilise basic electronic equipment with respect to measurement and interpretation of electronic data.</p>		
Module code: ELYM 127	Semester 2	NQF Level: 5
Title: Introduction to Electronics		
<p>Module outcomes:</p> <p>The learner should be able to demonstrate an understanding of the basics and applications of active devices, basic logic concepts and gates.</p> <p>Demonstrate an understanding of circuit theorems, and their application in the analysis of alternating and direct current circuits.</p> <p>Demonstrate a hands-on ability to utilise basic electronic equipment with for measurement and interpretation of electronic data.</p>		
Module code: ELYM215	Semester 1	NQF Level: 6
Title: Analogue Electronics and Systems		
<p>Module outcomes:</p> <p>The learner should be able to, demonstrate an understanding of transistor characteristics, transistor biasing and amplifier DC and AC equivalents.</p> <p>Demonstrate an understanding of advanced circuit theorems and their application in circuit analysis.</p> <p>Demonstrate an understanding of filters in terms of their transfer functions.</p> <p>Demonstrate a hands-on ability to apply basic electronic measurement and test equipment and techniques to the measurement and interpretation of electronic quantities in AC and DC circuits and circuits containing some active devices.</p>		
Module code: ELYM227	Semester 2	NQF Level: 6
Title: Digital Electronics and Systems		
<p>Module outcomes:</p> <p>The learner should be able to, demonstrate an understanding of basic logic concepts and elements. Apply Boolean algebra and Karnaugh map techniques to logic minimisation and circuit realisation of logic expressions.</p> <p>Demonstrate an understanding of combinational systems such arithmetic circuits, digital building blocks, and memory devices.</p> <p>Demonstrate a hands-on ability to apply basic electronic equipment and techniques to the measurement and interpretation of electronic quantities in Digital Electronics.</p>		
Module code: ELYM315	Semester 1	NQF Level: 7
Title: Advanced Analogue Electronics		
<p>Module outcomes:</p> <p>The learner should be able to, demonstrate an understanding of feedback and its implementation in amplifiers, Operational amplifiers and related circuit configurations, Active Filters and Oscillators, and High Frequency. Demonstrate a hands-on ability to apply electronic test equipment and techniques to the measurement and interpretation of electronic quantities in feedback, operational amplifiers, filters and high frequency.</p>		

NAS.2.8.11 PHYSIOLOGY / FISIOLOGIE

Module code: FLGX113	Semester 1	NQF Level: 5
Title / Titel: Introductory Physiology / Inleidende Fisiologie		
<p>Module outcomes / <i>Module uitkomst</i>:</p> <p>On completing the module,</p> <ul style="list-style-type: none"> the student will have basic knowledge regarding the structural and chemical composition of the human body, the cell structure, different membrane transport systems, homeostatic control systems, enzyme functioning, membrane potentials and cellular communication as a foundation for further studies in Physiology. The student will also be familiar with and be able to use relevant subject terminology. <p><i>Na voltooiing van die module moet die student in staat wees om:</i></p> <ul style="list-style-type: none"> <i>oor basiese kennis ten opsigte van die strukturele en chemiese samestelling van die menslike liggaam, die selstruktuur, verskillende membraan transportsisteme, homeostatiese beheerstelsels, ensiemwerking, membraan-potensiale en sellulêre kommunikasie beskik as onderbou vir verdere studie in Fisiologie.</i> <i>Die student sal ook die relevante vakkundige terminologie ken en kan gebruik</i> 		
Module code: FLGX123	Semester 2	NQF Level: 5
Title / Titel: Membrane and Muscle Physiology / Membraan- en Spierfisiologie		
<p>Module outcomes / <i>Module uitkomst</i>:</p> <p>On completing the module, the student must:</p> <ul style="list-style-type: none"> have in-depth knowledge of the biophysical (potential differences, load, current) flow and biochemical character (chemical composition of ion channels, conformation changes of channel proteins, ligand receptor interactions) of membrane physiology; have in-depth knowledge of the importance of membrane physiology in controlling physiological functions through change in membrane permeability; have basic knowledge regarding cellular communication and information transfer as a necessary foundation for further studies; be able to demonstrate fundamental knowledge of the functional anatomy of muscle tissue, the molecular mechanism of contraction, the processes associated with excitation contraction coupling and neuromuscular junction, as well as to discuss applications of these, for example to food poisoning; understand and be able to apply the principles of muscle mechanics, for example in using exercise apparatus; be able to describe and apply the energy metabolism of muscle contraction, for example in exercise; be able to distinguish between skeletal muscle, smooth muscle and heart muscle, and indicate the practical advantages of the differences; be able to discuss the control and coordination of motor movement, using effective examples as illustrations; demonstrate the ability to identify and analyse the causes and consequences of muscle defects, such as Myasthenia Gravis, muscular dystrophy, rigor mortis, hypertrophy and atrophy. 		

Na voltooiing van die module moet die student:

- *Grondige kennis hê van die biofisiese (potensiaalverskille, lading, stroomvloei) en biochemiese karakter (chemiese samestelling van ionkanale, konformasieveranderinge van kanaalproteïene, ligand-reseptor-interaksies) van membraanfisiologie.*
- *Oor 'n grondige kennis beskik van die belang van membraanfisiologie in die beheer van fisiologiese funksies deur die verandering in membraan deurlaatbaarheid.*
- *Oor basiese kennis ten opsigte van sellulêre kommunikasie en informasie oordrag beskik as noodsaaklike onderbou vir verdere studie.*
- *Fundamentele kennis kan demonstreer van die funksionele anatomie van spierweefsel, die molekulêre meganisme van kontrakisie, die prosesse geassosieer met eksitasie-kontrakisie koppeling en neuro-muskulêre aansluiting asook toepassings hiervan soos bv. voedselvergiftiging te kan bespreek.*
- *Die beginsels van spiermeganika verstaan en kan toepas in die gebruik van bv. oefenapparaat.*
- *Die energiemetabolisme van spierkontrakisie kan beskryf en toepas in bv. oefening.*
- *Kan onderskei tussen skeletspier, gladdespier en hartspier en die praktiese nut van die verskille aantoon.*
- *Die beheer en koördinerings van motoriese beweging kan bespreek en met effektiewe voorbeelde illustreer.*
- *Die vermoë demonstreer om oorsake en gevolge van spierafwykings soos Myasthenia Gravis, spierdistrofie, rigor mortis, hipertrofie en atrofie te identifiseer en te analiseer.*

Module code: FLGX213

Semester 1

NQF Level: 6

Title / Titel: Endocrine System and Digestion / : Endokriene Stelsel en Spysvertering

Module outcomes / Module uitkomst:

On completing the module , the student must:

- demonstrate knowledge of the properties and functioning of hormones and endocrine glands; demonstrate insight into the chemical classes of hormones using examples, and physiological functions of hormones in every class; be able to apply hormones as chemical messengers in homeostatic control mechanisms; be able to demonstrate fundamental knowledge of hormone synthesis, secretion and the control of secretion, transport, metabolism, mechanisms of hormonal functioning and the hypothalamus-thyroid control system; be able to apply knowledge of endocrinology to explain endocrine abnormalities, such as among others diabetes mellitus and hypo- or hyperthyroidism;
- be able to demonstrate fundamental knowledge of the functional anatomy, design, function and control (neural and hormonal) of the digestive tract and associated organs; be able to demonstrate the ability to identify and analyse the causes and consequences of defects of the digestive tract.

Na voltooiing van die module moet die student:

- *Kennis demonstreer van die eienskappe en funksionering van hormone en endokriene kliere. Insig demonstreer in die chemiese klasse van hormone met voorbeelde en fisiologiese funksies van hormone in elke klas. Hormone as chemiese boodskappers in homeostatiese beheermeganismes kan toepas. 'n Grondige kennis in hormoon sintese, sekresie en die beheer van sekresie,*

transport, metabolisme, meganismes van hormoonwerking, en die hipotalamus-hipofise beheersisteam kan demonstreer. Kennis van endokrinologie kan toepas om endokriene abnormaleite soos onder andere diabetes mellitus en hipo- of hipertiroïdisme te kan verklaar.

- *Fundamentele kennis van die funksionele anatomie, ontwerp, funksie en beheer (neuraal en hormonaal) van die spysverteringskanaal en geassosieerde organe kan demonstreer. Die vermoë kan demonstreer om oorsake en gevolge van afwykings van die spysverteringskanaal te identifiseer en te analiseer*

Module code: FLGX223

Semester 2

NQF Level: 6

Title / Titel: **Physiological Defence Mechanisms / Fisiologiese Verdedigingsmeganismes**

Module outcomes / Module uitkomst::

On completing the module, the student should:

- know and use the relevant subject terminology, demonstrate an in-depth knowledge of the defence mechanisms of the body, including the role of the skin as the first defence line, the non-specific and specific defence mechanisms of the body, as well as how the body fights the penetration of viruses, bacteria and also the formation of cancer cells;
- have knowledge of the coagulation of blood and the mechanism to limit the loss of blood (blood loss may threaten the survival of the body);
- be able to motivate the value of knowledge of the physiological defence mechanisms for human health and to argue and solve the relevant physiological defence mechanism problems in an integrated way.

Na voltooiing van die module behoort die student:

- *Die relevante vakkundige terminologie te ken en te gebruik, 'n grondige kennis van die verdedigingsmeganismes te openbaar wat insluit die rol van die vel as eerste verdedigingslinie, die nie-spesifieke en spesifieke verdedigingsmeganisme van die liggaam, asook hoe die liggaam die indringing van virusse en bakterieë, en ook die vorming van kankerselle beveg.*
- *Kennis te hê van koagulasie van bloed en die meganisme om bloedverlies te beperk (bloedverlies mag die liggaam se voortbestaan bedreig).*
- *Die waarde wat kennis van die fisiologiese verdedigingsmeganismes vir menslike gesondheid het te kan motiveer en die relevante fisiologiese verdedigingsmeganisme-probleme op 'n geïntegreerde wyse te kan beredeneer en op te los.*

Module code: FLGX224

Semester 2

NQF Level: 6

Title / Titel: **Metabolism / Metabolisme**

Module outcomes / Module uitkomst::

On completing the module the student must:

- discuss the role of Adenosinetriphosphate (ATP), energy sources and metabolic tempo;
- be able to draw and explain diagrams and schematic representations of the most important metabolic pathways, such as glycogenesis, glycogenolysis, Krebs Cycle and oxidative phosphorylation;
- be able to communicate aspects of carbohydrate, lipid and protein metabolism;
- to be able to discuss the properties, causes and consequences of metabolic defects, like ketosis and atherosclerosis.

Na voltooiing van die module moet die student:

- Die rol van Adenosientrifosfaat (ATP), energie bronne en metaboliese tempo kan bespreek.
- Diagramme en skematiese voorstellings van die belangrikste metaboliese weë soos glikogenese, glikogenolise, glukose, Krebs-siklus en oksidatiewe fosforilering kan teken en verduidelik.
- Oor aspekte van koolhidraat-, lipied- en proteïenmetabolisme kan kommunikeer.
- Die eienskappe, oorsake en gevolge van metaboliese afwykings soos ketose en aterosklerose kan bespreek

Module code / -kode: FLGX312

Semester 1

NQF Level / vlak: 7

Title /Titel: **Excretion / Uitskeiding**

Module outcomes / Module-uitkomst:

After completion of the module the student should have basic knowledge of the following:

- Components, structure, organisation, general design, mechanisms, functions and physical characteristics of the renal system, especially the nephron, as well as the composition of the body fluid compartments; especially the composition of the intracellular and extracellular component and the kidneys' role in maintaining homeostasis, including acid-base balance
- Knowledge of the link between kidney function and haemodynamics is also important
- Know and be able to use the relevant specialist terminology
- Know which sources contain scientific information on renal physiology
- Be able to practically apply the basic knowledge that has been learnt to his/her future occupation
- Demonstrate an ethically responsible attitude to the subject of physiology

Na voltooiing van die module behoort die student:

- Komponente, struktuur, organisasie, algemene ontwerp, meganismes, funksies en fisiese eienskappe van die renale stelsel, veral van die nefron, en ook van die samestelling van kompartemente van die liggaamsvloeiostowwe met besondere verwysing na die samestelling van die intrasellulêre en ekstrasellulêre komponent en die rol van die niere vir die instandhouding van die homeostase met inbegrip van die suurbasisbalans
- Kennis van die verband tussen nierfunksie en hemodinamika is ook van belang
- Die tersaaklike spesialis-terminologie ken en kan gebruik
- Weet watter bronne wetenskaplike inligting oor renale fisiologie bevat
- Die basiese kennis wat verwerf is prakties op sy of haar toekomstige beroep kan toepas
- 'n Eties verantwoordelike gesindheid jeens die vak Fisiologie toon

Module code / -kode: FLGX314

Semester 1

NQF Level / vlak: 7

Title /Titel: **Cardiovascular Physiology / Kardiovaskulêre Fisiologie**

Module outcomes / Module-uitkomst:

On completion of this module the student should be able to:

- know and be able to use the relevant subject terminology;
- demonstrate scientific knowledge and insight of components, structure, organisation, general design, mechanisms, functions and physical attributes of the cardiovascular system;
- explain the mechanical and electrical phenomena during the cardiac cycle;
- understand and apply knowledge of the integrated control of the cardiovascular system during stress conditions;
- describe the nervous control of blood pressure.

Na voltooiing van die module behoort die student:

- die relevante vakkundige terminologie te ken en kan gebruik;
- wetenskaplike kennis en insig te demonstreeer van die komponente, struktuur, organisasie, algemene ontwerp, meganismes, funksies en fisiese eienskappe van die kardiovaskulêre stelsel,
- die meganiese en elektriese verskynsels tydens die kardiale siklus te kan verduidelik,
- die geïntegreerde beheer van die kardiovaskulêre stelsel te verstaan en die kennis kan toepas in toestande waar die stelsel uitgedaag word,
- senuweebeheer van die bloeddruk te kan beskryf.

Module code / -kode: FLGX317

Semester 1

NQF Level / vlak: 7

Title /Titel: Cardiovascular Physiology / Kardiovaskulêre Fisiologie

Module outcomes / *Module-uitkomst*:

On completion of this module you should be able to:

- know and be able to use the relevant subject terminology;
- demonstrate scientific knowledge and insight of components, structure, organisation, general design, mechanisms, functions and physical attributes of the cardiovascular system;
- explain the mechanical and electrical phenomena during the cardiac cycle;
- understand and apply knowledge of the integrated control of the cardiovascular system during stress conditions;
- describe the nervous control of blood pressure.

Module-uitkomst:

Na voltooiing van hierdie module behoort jy:

- die relevante vakkundige terminologie te ken en kan gebruik;
 - wetenskaplike kennis en insig te demonstreeer van die komponente, struktuur, organisasie, algemene ontwerp, meganismes, funksies en fisiese eienskappe van die kardiovaskulêre stelsel,
 - die meganiese en elektriese verskynsels tydens die kardiale siklus te kan verduidelik,
 - die geïntegreerde beheer van die kardiovaskulêre stelsel te verstaan en die kennis kan toepas in toestande waar die stelsel uitgedaag word,
- senuweebeheer van die bloeddruk.*

Assessment criteria:

The student proves that the outcomes are achieved if he/she:

- knows the relevant terminology and have used them;
- has scientific knowledge and insight of the components, structure, organisation, overall design, mechanisms, functions, and physical features of the cardiovascular system and demonstrated it;
- explained the mechanical and electrical phenomena during the cardiac cycle;
- challenged the cardiovascular system and applied the knowledge in connection with the integrated control of the cardiovascular system;
- has described the nervous control of blood pressure.

Assessment methods - Formal formative:

Continuously by means of class tests, an assessment test, class assignments, and practical tests and reports.

Assessment methods – Summative:

Exam at end of semester.

Assessment plan:

Participation mark (50%) and summative assesment (50%).

Assesseringskriteria:

Die student bewys dat hy die uitkomst bemeester het as hy/sy:

- die relevante terminologie ken en gebruik het;
- oor wetenskaplike kennis en insig van die komponente, struktuur, organisasie, algemene ontwerp, meganismes, funksies en fisiese eienskappe van die kardiovaskulêre stelsel beskik en kan demonstreer;
- die meganiese en elektriese verskynsels tydens die kardiaale siklus verduidelik het;
- die kardiovaskulêre stelsel uitgedaag het en die kennis toegepas het in verband met die geïntegreerde beheer van die kardiovaskulêre stelsel;
- die senuweebeheer van die bloeddruk verduidelik het.

Assesseringsplan:

Deelname punt (50%) en summatiewe assessering (50%).

Method of delivery: Full-time /

Semester 2

NQF Level / vlak: 7

Metode van aflewering: Voltyds

Title /Titel: **Neurophysiology / Neurofisiologie**

Module outcomes / *Module-uitkomst:*

On completion of this module the student should be able to:

- understand the main functions of the nervous system and integrate them with existing anatomical knowledge;
- understand the functioning of the structural unit, the neuron, in the origin of electric impulse transmission in the sensory system;
- apply and integrate synapse and receptor functioning to ensure a homeostatic balance in the sensory system;
- describe, compare and evaluate the role of somatic sensations;
- explain the role of the sense organs in the sensory system as observers of changes in the environment;
- analyse, differentiate and explain the control and mechanisms involved in the motor systems on three levels, namely spinal cord, middle brain (mesencephalon) and corticospinal level;
- understand the role of the autonomic nervous system as part of the efferent motor system and as a contributing reaction component of stress, and integrate this with existing theoretical knowledge;
- know the functional anatomy of the cerebral cortex;
- after the dissection of a sheep's brain, know and describe the theoretical and practical components of the anatomical structure of the brain and know its functions;
- know which components make up intelligence, learning and memory patterns and integrate these with existing theoretical knowledge;
- understand the contribution of the cerebral cortex and the brainstem in terms of behaviour and motivation, as well as the neurohormonal systems that are involved;
- understand, analyse and draw conclusions about the mechanisms of general sleep patterns, brainwave activity and neurotransmitter systems;
- understand and describe brainwave activity and draw conclusions after conducting a professional electroencephalogram; and
- explain the importance of homeostatic brain metabolism and the cerebrospinal fluid system.
- observe electro-encephalogram-, electrocardiogram- en blood pressure responses during acute mental stress exposure; to understand, integrate and to draw conclusions.

Na voltooiing van die module behoort die student:

- die hoof funksies van die senuweestelsel te begryp en te integreer met bestaande anatomiese kennis;
- die strukturele eenheid, die neuron, se werking in die ontstaan van elektriese impulsgeleiding in die sensoriese stelsel te kan begryp;
- sinaps- en reseptorwerking te kan toepas en integreer om 'n homeostatiese balans in die sensoriese stelsel te verseker;
- die rol van somatiese sensasies te kan beskryf, vergelyk en evalueer;
- die rol van die sintuie in die sensoriese stelsel as waarnemers van veranderinge in die omgewing te kan verklaar;
- die beheer en meganismes betrokke by die motoriese stelsels op drie vlakke, naamlik rugmurg, middelbrein (mesenkefalon) en kortikospinale vlak te kan analiseer, onderskei en verklaar;
- die rol van die outonome senuweestelsel as deel van die efferente motoriese stelsel te begryp en ook as bydraende reaksiekomponent van stres te verstaan en te integreer met bestaande teoretiese kennis;
- die funksionele anatomie van die serebrale korteks te ken;
- te weet uit watter komponente intelligensie, leer en geheuepatrone bestaan en te kan integreer met bestaande teoretiese kennis;
- te verstaan wat die serebrale korteks en die breinstam se bydrae is ten opsigte van gedrag en motivering, asook die neurohormonale sisteme wat betrokke is;
- algemene slaappatrone, bringolfaktiwiteit en neurotransmittersisteme se meganismes te kan verstaan, ontleed en afleidings te kan maak;
- elektro-ensefalogram-, elektrokardiogram- en bloeddruk-reaksies waar te neem na toediening van akute mentale stressor; die data te verstaan, te integreer en gevolgtrekkings te kan maak.

Module code / -kode: FLGX326

Semester 2

NQF Level / vlak: 7

Title /Titel: **Reproductive Physiology / Voortplanting en Omgewingsfisiologie**

Module outcomes / Module-uitkomst:

On completion of this module the student should be able to:

- Integrated knowledge and understanding of the anatomy, physiology and control of the male and female reproductive systems, the physiological mechanisms of both genders and the principles of development toxicology within the field of reproductive physiology, and an understanding of how that knowledge relates to general reproductive health,
- Ability to identify, analyse and address the physiological adjustments and complications in the body of the mother during pregnancy, the physiological adjustments that takes place in the different systems of the neonate after birth, the changes that takes place during puberty and menopause and the influence of toxic substances on pregnancy and the development of the foetus and use this knowledge in theory driven arguments,
- Accurate and coherent written and verbal communication of hormonal contraception, other forms of contraception, various bacteriological and viral sexually transmitted diseases and the with respect for intellectual property conventions, copyright and rules on plagiarism,
- Reflection of all values, ethical conduct and justifiable decision making regarding moral-ethical matters relating to reproduction,
- Management of a group in an unfamiliar context in order to write a coherent report on a specified reproduction related issue, monitoring the progress of the group and taking responsibility for task outcomes and application of appropriate resources.

Na voltooiing van die module behoort die student:

- *Geïntegreerde kennis en verstaanbaarheid van die anatomie, fisiologie en beheer van die manlike en vroulike voortplantingstelsels te besit.*
- *Die vermoë om te identifiseer, analiseer en fisiologiese aanpassings en komplikasies in die liggaam te adresseer ten opsigte van moederlike swangerskap asook die fisiologiese aanpassings binne die verskeie sisteme van die neonaat na geboorte. Die veranderinge wat moet plaasvind tydens puberteit en menopouse met kennis in teorie-gedrewe argumente te kan staaf.*
- *Akkurate en samehangende geskrewe en verbale kommunikasie van hormonale kontrasepsie, ander vorme van kontrasepsie, verskeie bakteriologiese en virale seksueel oordraagbare siektes in terme van intellektuele eiendom aan te bied en om kopiëreg en reëls teen plagiaat te gehoorsaam.*
- *Refleksie van alle waardes, etiese kode en ingeligte besluitneming rakende moreel-etiese sake wat verwant is aan voortplanting.*
- *Bestuur van groep in onbekende konteks om samehangende verslag te kan lewer op gespesifiseerde voortplanting verwante kwessies asook om die vordering van die groep te beoordeel en verantwoordelikheid te neem ten opsigte van taak uitkomstes en om die nodige hulpbronne te raadpleeg.*

Module code / -kode: FLGX328

Semester 2

**NQF Level / vlak: 7
Credits / Krediete: 8**

Title / Titel: Reproductive Physiology / Voortplantingsfisiologie

Module outcomes / Module-uitkomst:

After completion of the module the student will be able to:

integrated knowledge and understanding of the anatomy, physiology and control of the male and female reproductive systems, the physiological mechanisms of both genders and the principles of development toxicology within the field of reproductive physiology, and an understanding of how that knowledge relates to general reproductive health, ability to identify, analyse and address the physiological adjustments and complications in the body of the mother during pregnancy, the physiological adjustments that takes place in the different systems of the neonate after birth, the changes that takes place during puberty and menopause and the influence of toxic substances on pregnancy and the development of the foetus and use this knowledge in theory driven arguments, accurate and coherent written and verbal communication of hormonal contraception, other forms of contraception, various bacteriological and viral sexually transmitted diseases and the with respect for intellectual property conventions, copyright and rules on plagiarism, reflection of all values, ethical conduct and justifiable decision making regarding moral-ethical matters relating to reproduction, management of a group in an unfamiliar context in order to write a coherent report on a specified reproduction related issue, monitoring the progress of the group and taking responsibility for task outcomes and application of appropriate resources.

Module-uitkomst:

Na voltooiing van die module sal die student in staat wees om:

*geïntegreerde kennis en verstaanbaarheid van die anatomie, fisiologie en beheer van die manlike en vroulike voortplantingstelsels te besit.
die vermoë om te identifiseer, analiseer en fisiologiese aanpassings en komplikasies in die liggaam te adresseer ten opsigte van moederlike swangerskap asook die fisiologiese aanpassings binne die verskeie sisteme van die neonaat na geboorte. Die veranderinge wat moet plaasvind tydens puberteit en menopouse met kennis in teorie-gedrewe argumente te kan staaf.*

akkurate en samehangende geskrewe en verbale kommunikasie van hormonale kontrasepsie, ander vorme van kontrasepsie, verskeie bakteriologiese en virale seksueel oordraagbare siektes in terme van intellektuele eiendom aan te bied en om kopiereg en reëls teen plagiaat te gehoorsaam.

refleksie van alle waardes, etiese kode en ingeligte besluitneming rakende moreel-etiese sake wat verwant is aan voortplanting.

bestuur van 'n groep in 'n onbekende konteks om 'n samehangende verslag te kan lewer op gespesifiseerde voortplanting verwante kwessies asook om die vordering van die groep te beoordeel en verantwoordelikheid te neem ten opsigte van taak uitkomstes en om die nodige hulpbronne te raadpleeg.

Assessment criteria:

The student demonstrates that the outcomes have been mastered if he/she:

is able to demonstrate integrated knowledge of the main areas of reproduction physiology including an understanding of and the ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories of the male and female reproduction systems in scenario specific case studies,

is capable to distinguish between the different physiological changes and complications in the female body during the different stages of pregnancy and also critically evaluate and discuss the effects of toxic substance abuse during pregnancy on both the mother and developing foetus by reflecting on the ethical aspects,

can present and evaluate the aetiology together with the causes, symptoms and treatment of reproduction specific diseases by demonstrating independent research capabilities, utilising updated resources and act on academic misconduct to avoid plagiarism,

can argue, evaluate and demonstrate detailed interpretation of ethical issues by means of physiological statements to reason given answers,

demonstrates leadership capabilities or excellent workmanship within a group to ensure consensual decision making, to fulfill allocated responsibilities and reflect on his/her own contribution within a group.

Assessment methods - Formal formative:

Continuously by means of class tests, an assessment test, class assignments, and practical tests and reports.

Assessment methods – Summative:

Exam at end of semester.

Assessment plan:

Participation mark (50%) and summative assesment (50%).

Assesseringskriteria:

Die student demonstreeer dat die uitkomstes bemeester is deurdat hy/sy:

die vermoë het om integreerde kennis van die hoof areas van voortplanting te kan demonstreeer, asook om verstaanbaarheid ten opsigte van hoofbeginsels, konsepte, terminologie, reëls en teorieë van die manlike en vroulike voortplantingstelsels te toon.

vaardig is om te onderskei tussen die fisiologiese veranderinge en komplikasies in die vroulike liggaam in die verskeie fases van swangerskap en ook om die effekte van toksiese substansie se misbruik tydens swangerskap krities te evalueer.

die etiologie tesame met gevolge, simptome en behandeling kan voorstel en evalueer in terme van spesifieke voortplantingsiektes. Hierdie sal hy/sy onafhanklike navorsingsvaardighede kan demonstreeer en die nuutste hulpbronne gebruik en akademies korrek optree.

interpretasie van etiese kwessies kan beredeneer, evalueer en demonstreeer deur vanuit fisiologiese standpunte antwoorde kan gee.

leierskap eienskappe te demonstreeer of uitstekende samewerking te toon binne groepsverband om eenvormige besluitneming te maak, om verantwoordelikhede na te kom om eie betrokkenheid binne die groep te reflekteer.

Assesseringsplan:

Deelname punt (50%) en summatiewe assessering (50%).

Method of delivery: Full-time / **Metode van aflewering:** Voltyds

Module code / -kode: FLGX329

Semester 2

NQF Level / vlak: 7
Credits / Krediete: 8

Title /Titel: Cardiovascular Physiology / Kardiovaskulêre Fisiologie toepassings

Module outcomes / Module-uitkomst:

The student must obtain the following module outcomes:

the dominant role of the kidney in the long-term regulation of arterial blood pressure;

present different models of hypertension;

conduct a quantitative analysis of cardiac output control;

display knowledge and insight of coronary circulation be able to apply this in coronary ailments;

apply this information in a variety of applications like myocardial infarction, heart failure and circulatory shock;

understand the lifestyle changes used for the prevention of cardiovascular diseases, and

show scientific knowledge and insight of the nature of cardiovascular health problems and the prevention thereof.

Module-uitkomst:

Die student moet die volgende uitkomst bemeester:

die dominante rol van die nier in die langtermynbeheer van die arteriële bloeddruk te kan kommunikeer;

verskillende modelle van hipertensie te kan uiteensit;

'n kwantitatiewe analise van kardiaale omset beheer te kan doen;

kennis en insig te toon van koronêre sirkulasie en te kan toepas in koronêre aandoenings;

hierdie kennis te kan toepas in 'n verskeidenheid toepassings soos miokardiale infarksie, hartversaking en sirkulatoriese skok;

lewensstylaanpassings vir die voorkoming van kardiovaskulêre siektes te begryp, en

wetenskaplike kennis en insig toon van die aard van kardiovaskulêre gesondheidsprobleme en die voorkoming daarvan.

Assessment criteria:

The student prove that he mastered the module outcomes if he/she:

communicated the dominant role of the kidney in the long term control of the arterial blood pressure;

presented different models of hypertension;

conducted a quantitative analysis of cardiac output control;

has knowledge and insight of the coronary circulation and applied it on coronary ailments;

has applied the knowledge on applications like myocardial infarction, heart failure, and circulatory shock;

understand the lifestyle changes used for the prevention of cardiovascular diseases, and

has scientific knowledge and insight in the nature of cardiovascular health problems and the prevention thereof.

Assessment methods - Formal formative:

Continuously by means of class tests, an assessment test, class assignments, and practical tests and reports.

Assessment methods – Summative:

Exam at end of semester.

Assessment plan:

Participation mark (50%) and summative assesment (50%).

Assesseringskriteria:

Die student bewys dat hy/sy die uitkomste bemeester het indien hy/sy:

die dominante rol van die nier in die langtermynbeheer van die arteriële bloeddruk gekommunikeer het;

verskillende modelle van hipertensie uiteengesit het;

'n kwantitatiewe analise van die kardiaale omsit beheer gedoen het;

oor kennis en insig beskik van die koronêre sirkulasie en dit toegepas het in koronêre aandoenings;

die kennis toegepas het in toepassings soos miokardiale infarksie, hartversaking en sirkulatoriese skok ;

lewensstylaanpassings vir die voorkoming van kardiovaskulêre siektes begryp het, en

beskik oor wetenskaplike kennis en insig in die aard van kardiovaskulêre gesondheidsprobleme en die voorkoming daarvan.

Assesseringsplan:

Deelname punt (50%) en summatiewe assessering (50%).

Method of delivery: Full-time / **Metode van aflewering:** Voltyds

Module code / -kode: FKLT331

Semester 1

NQF Level / vlak: 7

Title / Titel:

Module outcomes / Module-uitkomste:

Not received.

NAS.2.8.12 PHYSICS / FISIKA

Module code: NPHY111

Semester 1

NQF Level: 5

Title / Titel: **Basic Physics 1 / Basiese Fisika I**

Module outcomes / Module uitkomste::

On completing of the module the student must have

- Formal mathematical knowledge and informed understanding of the fundamental concepts underpinning the subthemes of physics, i.e., kinematics, Newtonian laws of motion, work and energy, momentum, rotation and rolling, equilibrium, gravity, fluid mechanics, simple harmonic motion, waves, the study of heat, and thermodynamics.
- An awareness of the development of physical measurements and theories that shaped the progress of physics;
- The ability and skills to explain certain parts of the theory by means of the basic differential and integral calculus; to solve a variety of natural science problems in the above-mentioned subthemes and to evaluate the answers and apply them to phenomena within a well-defined and familiar environment.
- Effective utilisation of basic research skills, such as conducting experiments, measuring basic observable quantities related to special and controlled cases of natural processes, and processing these data. The ability to reliably communicate

these discipline-specific ideas by writing a report in an accurate and coherent way while showing respect for conventions related to copyright and plagiarism.

- The ability to manage his or her learning and implement the discipline-specific learning strategies given in the FSKS111 study guide to address learning problems.
- The ability to work in a group and make appropriate contributions and sharing resources to successfully complete the practical sessions and thereby taking co-responsibility for the attainment of the outcomes by the group.
 - Conduct in the academic environment that adheres to the rules as stipulated by the North-West University code of conduct.

Na voltooiing van die module moet die student:

- *Formele wiskundige kennis en ingeligte begrip van die fundamentele konsepte van die volgende subtemas van fisika, nl. kinematika, Newton se bewegingswette, arbeid en energie, momentum, rotasie en rolbeweging, ewewig, gravitasie, fluïdemeganika, enkelvoudige harmoniese beweging, golwe, warmteleer en termodinamika;*
- *'n Bewustheid van die ontwikkeling van fisiese waarnemings en teorieë wat die ontwikkeling van fisika gevorm het;*
- *Die vermoë en vaardigheid om sekere gedeeltes van die teorie met behulp van basiese differensiaal- en integraalrekenes te beskryf; om 'n verskeidenheid van natuurkundige probleme in bogenoemde subtemas op te los sowel as die evaluering van die antwoorde en toepassing daarvan m.b.t. verskynsels binne 'n goed-gedefinieerde en bekende omgewing.*
- *Aanwending van basiese navorsingsvaardighede, soos uitvoering van eksperimente, meting van basiese waarneembare groothede, en dataverwerking. Die vermoë om vakspesifieke idees skriftelik in 'n verslag te kommunikeer op 'n koherente, akkurate en betroubare wyse met inagneming van die konvensies rakende kopiëring en plagiaat.*
- *Die vermoë om sy of haar leeraktiwiteite te bestuur en vakspesifieke leerstrategieë, soos aangetoon in die FSKS111 studiegids, te implementeer om leerprobleme aan te spreek.*
- *Die vermoë om in 'n groep te kan werk en gepaste bydraes te maak en hulpbronne te deel om die praktiese sessies suksesvol af te handel; om sodoende medeverantwoordelikheid te neem vir die bereiking van die uitkoms deur die groep.*

Module code: FSKS113

Semester 1

NQF Level: 5

Title / Titel: Physics for Biology I / Fisika vir Biologie

Module outcomes / Module uitkomstes:

Knowledge:

Knowledge and insight in how physics occurs in natural science phenomena that are selected mainly from biological sciences by explaining and discussing topics such as kinematics, Newtonian laws of motion, torques, work, energy, and power, with applications to the human body, fluid mechanics, pressure, surface tension, viscosity, with applications to the flow of blood, theory of heat, and thermodynamics;

Skills:

Skills in measuring, processing and reporting natural science processes.

Kennis:

Kennis en insig t.o.v. hoe Fisika in natuurwetenskaplike verskynsels, hoofsaaklik vanuit die biologiese wetenskappe, voorkom deur die volgende onderwerpe te verduidelik en te bespreek, nl. kinematika, Newton se bewegingswette, wringkrigte, arbeid, energie en drywing met toepassings op die menslike liggaam, fluïdemeganika, druk, oppervlakspanning, viskositeit, met toepassings op bloedvloei, warmteleer en termodinamika.

Vaardighede:

Vaardighede in die meet, verwerking en verslaggewing van natuurwetenskaplike prosesse

Module code: NPHY121**Semester 2****NQF Level: 5****Title / Titel: Basiese Fisika II / Basiese Fisika II**Module outcomes / *Module uitkomst:*

On completing of the module the student must have

- Formal mathematical knowledge and informed understanding of the fundamental concepts underpinning the subthemes of physics, i.e. electricity, magnetism, optics and topics from the quantum, atom and nuclear physics;
- An awareness of the development of physical measurements and theories that shaped the progress of physics;
- Strengthening of his/her ability and skills to explain certain parts of the theory by means of the basic differential and integral calculus; to solve a variety of natural science problems in the above-mentioned subthemes and to evaluate the answers and apply them to phenomena within a well-defined and familiar environment.
- Effective utilisation of basic research skills, such as conducting experiments, measuring basic observable quantities related to special and controlled cases of natural processes, and processing these data. The ability to reliably communicate these discipline-specific ideas by writing a report in an accurate and coherent way while showing respect for conventions related to copyright and plagiarism.
- The ability to manage his or her learning and implement the discipline-specific learning strategies given in the FSKS121 study guide to address learning problems.
- The ability to work in a group and make appropriate contributions and sharing resources to successfully complete the practical sessions and thereby taking co-responsibility for the attainment of the outcomes by the group.
 - Conduct in the academic environment that adheres to the rules as stipulated by the North-West University code of conduct.

Na voltooiing van die module moet die student

- *Formele wiskundige kennis en ingeligte begrip van die fundamentele konsepte van die volgende subtemas van fisika, nl. elektrisiteit en magnetisme, optika en onderwerpe uit die kwantum-, atoom- en kernfisika;*
- *'n Bewustheid van die ontwikkeling van fisiese waarnemings en teorieë wat die ontwikkeling van fisika gevorm het;*
- *Die versterking van sy/haar vermoë en vaardigheid om sekere gedeeltes van die teorie met behulp van basiese differensiaal- en integraalrekeninge te beskryf; om 'n verskeidenheid van natuurkundige probleme in bogenoemde subtemas op te los sowel as die evaluering van die antwoorde en toepassing daarvan m.b.t. verskynsels binne 'n goed-gedefinieerde en bekende omgewing.*
- *Aanwending van basiese navorsingsvaardighede, soos uitvoering van eksperimente, meting van basiese waarneembare groothede, en dataverwerking. Die vermoë om vakspesifieke idees skriftelik in 'n verslag te kommunikeer op 'n koherente, akkurate en betroubare wyse met inagneming van die konvensies rakende kopiëring en plagiaat.*
- *Die vermoë om sy of haar leeraktiwiteite te bestuur en vakspesifieke leerstrategieë, soos aangetoon in die FSKS121 studiegids, te implementeer om leerprobleme aan te spreek.*
- *Die vermoë om in 'n groep te kan werk en gepaste bydraes te maak en hulpbronne te deel om die praktiese sessies suksesvol af te handel; om sodoende medeverantwoordelikheid te neem vir die bereiking van die uitkoms deur die groep.*
- *Gedrag in die akademiese omgewing wat voldoen aan die gedragskode van die Noordwes-Universiteit*

Module code: NPHY124	Semester 2	NQF Level: 8
Title / Titel: Intriduction to Basic Physics Concepts		
<p>Module Outcomes: Upon completion of this course the student would:</p> <ul style="list-style-type: none"> • Have a detailed and integrated knowledge of Basic Physics, as especially applicable to the specialized fields of Mechanics, electricity and magnetism. • Be able to demonstrate mathematical knowledge of the fundamental principles i.e. force, work, energy, momentum, electrostatics, direct currents circuits, magnetostatics, electromagnetic induction and alternating currents • Derive and understand the awareness of the development of physical measurements and theories that shaped the progress of physics. • Demonstrate a detailed knowledge of applying vector skills to solve kinematics problems and to evaluate the answers and apply them to phenomena within a well-defined and familiar environment. • Apply the above specialized skills and integrated knowledge to identify and creatively solve complex and unfamiliar problems at the forefront of the field in mechanics and electromagnetism by selecting and applying the correct problem solving techniques, and evaluating and critically reviewing the rigorous solutions acquired by referring to multiple sources in the scientific literature, taking full responsibility for the work done. 		
Module code: FSKS123	Semester 2	NQF Level: 5
Title / Titel: Physics for Biology II / Fisika vir Biologie II		
<p>Module outcomes / <i>Module uitkomst</i>:</p> <p>Knowledge: Knowledge and insight in how physics occurs in natural science phenomena so that he/she can explain and discuss electrostatics, electric potential, electric circuits, magnetism and electromagnetic waves, with applications to apparatus used in biological sciences, as well as waves, sound, optics and nuclear physics;</p> <p>Skills: Skills to solve problems in measuring, processing and reporting natural science processes.</p> <p>Kennis: <i>Kennis en insig t.o.v. hoe Fisika in natuurwetenskaplike verskynsels voorkom, sodat hy/sy die volgende kan verduidelik en bespreek: elektrostatika, elektriese potensiaal, elektriese stroombane, magnetisme en elektromagnetiese golwe, met toepassing op apparaat wat in die biologiese wetenskappe gebruik word, sowel as golwe, klank, optika en kernfisika.</i></p> <p>Vaardighede: <i>Vaardighede in die meet, verwerking en verslaggewing van natuurwetenskaplike prosesse.</i></p>		
Module code: NPHY211	Semester 1	NQF Level: 6
Title / Titel: Electricity and Magnetism / Elektrisiteit en Magnetisme		
<p>Module outcomes: / <i>Module uitkomst</i>: On completing of the module the student must</p> <ul style="list-style-type: none"> • be able to demonstrate understanding and detailed knowledge of the fundamental concepts underpinning the subthemes of electricity and magnetism, i.e. the laws of electrostatics and magnetostatics in a vacuum and in matter as well as 		

introductory electrodynamics, which includes the electromotive force and electromagnetic induction.

- A clear understanding of prevalent schools of thought that determined the progress within the field of electricity and magnetism.
- The ability to evaluate, select and apply the correct laws to describe different phenomena in the context of electricity and magnetism.
- The ability to solve different problems by calculating electrostatic potentials and fields, magnetostatic fields as well as basic problems in electrodynamics like the electromotive force and electromagnetic induction.
- Use discipline-specific methods of scientific enquiry, decision-making and information gathering to execute practical work. Analyze the results and produce an accurate and coherent written and/or oral account of the information using an appropriate discipline-specific format. Understand the ethical implications of decisions and actions in this context.

Na voltooiing van die module moet die student

- *In staat wees om begrip en gedetailleerde kennis van die fundamentele begrippe onderliggend aan die subtemas van elektrisiteit en magnetisme, nl. die wette van elektrostatika en magnetostatika in vakuum en in materie, te toon, sowel as inleidende elektrodinamika, insluitend elektromotoriese krag en elektromagnetiese induksie.*
- *'n Duidelike begrip hê van die denkrigtings, wat vooruitgang in die veld van elektrisiteit en magnetisme bepaal het.*
- *Die vermoë hê om die korrekte wette, wat verskillende verskynsels beskryf, te evalueer, selekteer en toe te pas, binne die konteks van elektrisiteit en magnetisme.*
- *Die vermoë hê om probleme op te los deur elektrostatiese potensiale- en velde en magnetostatiese velde te bereken, sowel as om basiese probleme in elektrodinamika, soos elektromotoriese krag en elektromagnetiese induksie, op te los.*
- *Gebruik maak van vak-spesifieke metodes van wetenskaplike ondersoek, besluitneming en versameling van inligting, om praktiese werk uit te voer. Analisering van die resultate en saamstel van akkurate en koherent-geskrewe en/of mondelinge aanbieding van die inligting deur gebruik te maak van toepaslike vak-spesifieke formaat. Verstaan van die etiese implikasies van besluite en optrede binne hierdie konteks.*

Module code: NPHY222

Semester 1

NQF Level: 6

Title / Titel: Optics and Waves / Optika en Golwe

Module outcomes / Module uitkomstes:

On completing of the module the student must have

- Detailed knowledge of, and the ability to apply, the fundamental concepts and theories underpinning the physics of optics and waves, i.e., geometrical optics, electromagnetic wave properties and propagation, interference, diffraction and polarisation in unfamiliar, but relevant contexts.
- A critical understanding of the development of knowledge within the physics subfields optics and waves as a result of the existence of different schools of thought.
- The ability and skill to evaluate, select, and effectively apply methods, procedures and applications typical to optics and waves to solve problems within unfamiliar contexts.
- The ability and skill to use discipline-specific methods of scientific enquiry to investigate relevant problems within optics and waves through well-developed processes of analysis, synthesis and evaluation.

- Apply the results of a scientific investigation or experiment in a given context in optics and waves and communicate these findings accurately and coherently with an understanding of and respect for intellectual property conventions, copyright and rules on plagiarism.
- The ability to make decisions and show appropriate behaviour in familiar and new subject-specific contexts guided by an appreciation for the interdependence of different systems.
- Take responsibility for his or her learning progress by application of relevant learning strategies and as measured against given criteria as stipulated in the NPHY222 (formerly NPHY222) study guide.
- The ability to work in a group and make appropriate contributions and sharing resources to successfully complete the practical sessions and thereby taking co-responsibility for the attainment of the outcomes by the group within a well-defined context.

Na voltooiing van die module behoort die student

- *'n in diepte kennis van die konsepte en teorieë binne die vakgebied fisika, en spesifiek die subtemas optika en golwe, i.e., geometriese optika, eienskappe en voortplanting van elektromagnetiese straling, interferensie, diffraksie en polarisasie en die vermoë om dit binne onbekende, maar relevante situasies toe te pas.*
- *Kritiese begrip van die ontwikkeling van kennis binne die fisika subtemas van optika en golwe as gevolg van die bestaan van verskillende denkskole.*
- *Die vermoë om metodes en prosedures tipies aan optika en golwe te evalueer, selekteer, en effektief toe te pas om probleme in 'n onbekende konteks op te los.*
- *Die vermoë om vakspesifieke ondersoek- en wetenskaplike metodes te gebruik om probleme van toepassing op optika en golwe te ondersoek deur middel van goed-ontwikkelde analise-, sintese- en evalueringsprosesse.*
- *Die vermoë om die bevindinge van 'n wetenskaplike ondersoek in 'n gegewe subtema van optika en golwe toe te pas en akkuraat en saamvallend te kommunikeer met begrip en respek vir die konvensies rondom intellektuele eiendom, kopiëring en plagiaat.*
- *Die vermoë om besluite te neem en gepaste gedrag aan die hand te lê in bekende en nuwe vakspesifieke kontekste aangevoer deur 'n waardering vir die interafhanklikheid van die verskillende stelsels.*
- *Neem verantwoordelikheid vir sy of haar akademiese vordering deur die toepassing van relevante leerstrategieë en soos gemeet teen die gegewe kriteria volledig in die NPHYS222 (voorheen NPHY222) studiegids uiteengesit.*
- *Die vermoë om in 'n groep te kan werk en gepaste bydraes te maak en hulpbronne te deel om die praktiese sessies suksesvol af te handel; om sodoende medeverantwoordelikheid te neem vir die bereiking van die uitkoms deur die groep binne 'n goed-afgebakende konteks.*
- *Gedrag in die akademiese omgewing wat voldoen aan die gedragskode van die Noordwes-Universiteit.*

Module code: NPHY212

Semester 2

NQF Level: 6

Title / Titel: Modern Physics / Moderne Fisika

Module outcomes / *Module uitkomstes*:

On completing of the module the student must have

- Detailed knowledge of and the ability to apply the fundamental concepts and theories underpinning Modern Physics at an introductory level, i.e., Special Relativity, Lorentz's Transformations, Time Dilation, Length Contraction, the Doppler Effect, the Particle Properties of Waves, Blackbody Radiation, the Photoelectric Effect, the properties of X-Rays in unfamiliar, but relevant contexts.

- A critical understanding of the development of knowledge within the physics sub-theme of Modern Physics: Special Relativity and the Particle Properties of Waves, how it changed our understanding of Physics during the 20th century, up to the present.
- The ability and skill to evaluate, select and effectively apply methods, procedures and applications typical to the physics sub-theme of Special Relativity to solve problems within unfamiliar contexts.
- The ability and skill to use discipline-specific methods of scientific enquiry to investigate relevant problems within Special Relativity through well-developed processes of analysis, synthesis and evaluation.
- Apply the results of a scientific investigation or experiment in a given context in the physics sub-themes of introductory modern physics and communicate these findings accurately and coherently with an understanding of, and respect for, intellectual property conventions, copyright and rules on plagiarism.
- The ability to make decisions and show appropriate behaviour in familiar and new subject-specific contexts guided by an appreciation for the interdependence of different systems.
- Take responsibility for his or her learning progress by application of relevant learning strategies and as measured against given criteria as stipulated in the NPHY212 study guide.
- The ability to work in a group and make appropriate contributions and sharing resources to successfully complete the practical and tutorial sessions and thereby taking co-responsibility for the attainment of the outcomes by the group

Na voltooiing van die module behoort die student

- *'n Gedetailleerde kennis en vermoë tot die toepassing van die fundamentele begrippe en teorieë onderliggend aan Moderne Fisika op inleidende vlak, d.i. Spesiale Relatiwiteit, Lorentztransformasies, Tyddilatasie, Lengtekontraksie, die Doppler Effek, die Deeltjie-eienskappe van golwe, Swartstraling, die Foto-elektriese effek, eienskappe van X-strale in onbekende, maar relevante konteks.*
- *Kritiese begrip van die ontwikkeling van kennis binne die fisika subtema van Moderne Fisika: Spesiale Relatiwiteit en die Deeltjie-eienskappe van golwe en hoe dit ons begrip van fisika en die twintigste eeu tot van vandag verander het.*
- *Die vermoë en vaardigheid om metodes, prosedures en toepassings, eie aan die subtema van Spesiale Relatiwiteit, te evalueer, selekteer en effektief toe te pas ten einde probleme in onbekende kontekste op te los.*
- *Die vermoë en vaardigheid om vakspesifieke metodes van wetenskaplike ondersoek te gebruik ten einde relevante probleme binne Spesiale Relatiwiteit op te los deur goedontwikkelde prosesse van analise, sintese en evaluasie.*
- *Pas die resultate van 'n wetenskaplike ondersoek of eksperiment, in 'n gegewe konteks binne die fisika subtemas van inleidende moderne fisika, toe en kommunikeer hierdie bevindinge op 'n akkurate en koherente wyse met begrip van, en respek vir, intellektuele eiendomskonvensies, kopiereg en reëls oor plagiaat.*
- *Die vermoë om besluite te neem en gepaste gedrag te toon in bekende en nuwe vak-spesifieke kontekste gelei deur 'n waardering van die onderlinge afhanklikheid van verskillende stelsels.*
- *Neem verantwoordelikheid vir sy of haar vordering deur toepassing van geskikte leerstrategieë en gemeet aan die gegewe kriteria soos uiteengesit in die NPHY 212 gids.*
- *Die vermoë om in groep te werk, geskikte bydraes te maak en hulpbronne te deel ten einde die praktiese en tutoriaal-sessies suksesvol te voltooi en daardeur medeverantwoordelikheid te aanvaar vir die behaal van die uitkomst deur die groep, binne 'n goedgedefinieerde konteks.*

Module code: NPHY221	Semester 2	NQF Level: 6
Title / Titel: Introductory Quantum Mechanics / Inleidende Kwantum Meganika		
Module outcomes / <i>Module uitkomst</i> : On completing of the module the student must have <ul style="list-style-type: none"> • The purpose of this module is to develop a theoretical understanding of the phenomena of waves, • and to provide a solid grounding for the study and application of concepts in quantum mechanics. • At the end of this module the students acquire a formal mathematical knowledge of the topics covered on how to solve simple oscillation problems that involve damped and driven harmonic motion; describe mathematically the superposition of waves; study and apply fundamental concepts in quantum mechanics. • State the laws, definitions and principles of abovementioned concepts concisely in their own words, without excluding any relevant information. • Solve the aforementioned differential equations as initial value problems. • Discuss the evolution of the aforementioned situations with time. • Discuss the Heisenberg uncertainty principle meaningfully. • Solve Schrödinger equation for <ul style="list-style-type: none"> (i) a free particle and the related concepts (ii) a particle in an infinite square well • Solve problems similar to those in they have met in the examples; the problems to be solved are applications of the above mentioned topics <p><i>By voltooiing van hierdie kursus behoort studente:</i></p> <ul style="list-style-type: none"> • <i>Teoretiese begrip van die verskynsel van golwe verwerf het.</i> • <i>Soliede grondslag vir die studie en toepassing van die begrippe in kwantumeganika ontwikkel het.</i> • <i>Formele wiskundige kennis van die onderwerpe, wat behandel is, te hê ten einde eenvoudige ossillasieprobleme, wat gedempte en gedrewe harmoniese beweging insluit, op te los.</i> • <i>Die kennis, om die superposisie van golwe wiskundig te beskryf, verwerf het.</i> • <i>Fundamentele begrippe in kwantumeganika te kan toepas.</i> • <i>In staat wees om die fundamentele wetmatighede, definisies en begrippe van bogenoemde beginsels in hul eie woorde te stel, sonder om enige relevante inligting uit te laat.</i> • <i>In staat te wees om bogenoemde differensiaalvergelykings en aanvangswaarde probleme op te los.</i> • <i>In staat wees om die evolusie van bogenoemde situasies met tyd, te bespreek.</i> • <i>In staat wees om Heisenberg se onsekerheidsbeginsel betekenisvol te bespreek.</i> • <i>In staat wees om die Schrödingervergelyking op te los vir</i> <ul style="list-style-type: none"> (i) <i>"n vrye deeltjie en verwante begrippe</i> (ii) <i>'n deeltjie in oneindige diep potensiaalput.</i> • <i>In staat wees om probleme, soortgelyk aan die wat hulle in voorbeelde behandel het, en wat toepassings van bogenoemde onderwerpe is, te kan oplos</i> 		
Module code: NPHY311	Semester 1	NQF Level: 7
Title / Titel: Electromagnetism		
Module outcomes / <i>Module uitkomst</i> : <ul style="list-style-type: none"> • Initially, this module follows and builds on what was learnt in module NPHY211 (Electricity and Magnetism) by providing a firm theoretical background to describe previously learnt concepts, so that students gain a more mathematically formal understanding and integrated and detailed knowledge of electricity and magnetism 		

while being able to relate previously learnt material with new concepts encountered in this module.

- Subsequently, the Maxwell equations in both a vacuum and matter in general are derived. These equations are fundamental to our understanding of all electromagnetic phenomena.
- Students proceed to master and evaluate solutions to these equations in various scenarios, such as for dielectrics, conductors, waveguides, and optical fibres, and resolve complex problems related to these applications by identifying, selecting and applying the correct problem solving techniques.
- Furthermore, basic research skills will be acquired and applied in the practical component of this course, where some aspects of electromagnetism are experimentally investigated. Here students will conduct experiments effectively which measure basic observable quantities related to special and controlled cases of natural processes, processing and critically evaluating the data so acquired.
- Students will learn how to reliably demonstrate, develop and communicate discipline-specific ideas by planning and writing experimental reports in an accurate and coherent way, while respecting conventions related to copyright and plagiarism and taking full responsibility for their work with regards to this, thereby gaining valuable scientific writing skills.
- *Aanvanklik volg hierdie module dit wat in NPHY211 (Elektrisiteit en Magnetisme) geleer is en bou daarop, deur 'n stewige teoretiese agtergrond te verskaf en reeds-bekende konsepte te beskryf, sodat studente ? meer wiskundig-formele begrip en geïntegreerde en gedetailleerde kennis van elektrisiteit en magnetisme kan verkry en ook in staat sal wees om vooraf-bekende materiaal met nuwe konsepte, wat hulle teëkom, in verband te bring.*
- *Vervolgens word die algemene Maxwellvergelykings in beide vakuum en in materie afgelei. Hierdie vergelykings is grondliggend tot ons begrip van elektromagnetiese verskynsels.*
- *Vervolgens bemeester en evalueer studente oplossings van hierdie vergelykings in verskeie scenario's, soos diëlektrika, geleiers, golfleiers, optiese vesels, en los komplekse probleme op in verband met hierdie toepassings deur die korrekte probleemoplossingstegnieke te identifiseer, selekteer en toe te pas.*
- *Verder word basiese navorsingsvaardighede bemeester en toegepas in die praktiese komponent van hierdie kursus, waarin sekere aspekte van elektromagnetisme eksperimenteel ondersoek word. Studente sal hier eksperimente effektief uitvoer, en basiese waarneembare groothede, in verband met spesiale en gekontroleerde gevalle van natuurlike prosesse, meet en sodoende die ingesamelde data verwerk en krities evalueer.*
- *Studente sal leer om betroubaar, vak-spesifieke idees te demonstreer, ontwikkel en kommunikeer en om die beplanning en skryf van eksperimentele verslae, op ? akkurate en koherente manier, in ooreenstemming met die konvensies in verband met kopiereg en plagiaat, uit te voer en moet volle verantwoordelikheid aanvaar vir hul werk in hierdie verband, sodat hulle waardevolle wetenskaplike skryfvaardighede kan ontwikkel*

Module code: FSKS312

Semester 1

NQF Level: 7

Title / Titel: Wave Mechanics / Golfmeganika

Module outcomes / Module uitkomst:

Knowledge:

At the end of this module, students will have been introduced to the first principles of quantum physics in the form of wave mechanics as replacement of Newtonian mechanics.

Skills:

Students learn to do basic quantum mechanical calculations and to solve applicable differential equations. In the practical sessions, they study quantum mechanical phenomena and report on these by means of computerised reports.

Kennis: *Aan die einde van hierdie module het studente met die eerste beginsels van die kwantumfisika in die vorm van golfmeganika as vervanging vir Newtonmeganika kennis gemaak.*

Vaardighede:

Studente leer om basiese kwantummeganiese berekenings te doen, en om toepaslike differensiaalvergelykings op te los. In die praktika word kwantummeganiese verskynsels bestudeer waarvoor rekenaarmatig verslag gelewer word.

Module code: FSKS321**Semester 2****NQF Level: 7**Title / Titel: **Thermodynamics / Termodinamika**

Module outcomes / Module uitkomst:

Knowledge:

After the introduction in NPHY111, students receive a formal education in the following topics: the zeroth, first, second, and third laws of thermodynamics. The concepts of entropy, Tds-equations, Helmholtz and Gibbs functions, potential functions, equilibrium, and phase transitions are introduced by a simple statistical description of an isolated system with emphasis on the example of an ideal gas.

Skills:

Students learn how to develop and present abstract theory and to apply thermodynamic principles to systems, like the atmosphere, and to certain cyclic processes like those of heat engines and refrigerators. Great emphasis is placed on problem solving as the outstanding method to apply physics practically. In the practical sessions accurate measurements are made on pulsating stars, students learn how to measure heat capacity and they gain experience in applying their thermodynamic knowledge to astrophysical problems.

Kennis:

Na die inleiding in NPHY111 kry studente 'n formele opleiding in die volgende onderwerpe: die nulde, eerste, tweede, en derde wette van termodinamika. Die begrippe entropie, Tds-vergelykings, Helmholtz- en Gibbsfunksies, potensiaal funksies, ewewig en fase-oorgange word uit 'n eenvoudige statistiese beskrywing van 'n geïsoleerde sisteem ingevoer, met klem op die voorbeeld van 'n ideale gas.

Vaardighede:

Studente leer hoe om abstrakte teorie te ontwikkel en weer te gee, en om termodinamiese beginsels op stelsels soos die atmosfeer en bepaalde sikliese prosesse soos warmtemasjiene en verkoelers toe te pas. Groot klem word op probleemoplossing gelê as dié uitstaande manier om Fisika prakties te kan toepas. In die praktika word noukeurige metings op wisselsterre gedoen, studente leer hoe om warmtekapasiteit te meet, en hulle kry ervaring om termodinamiese kennis op astrofisiese probleme toe te pas.

Module code: FSKS322**Semester 2****NQF Level: 7**Title / Titel: **Nuclear Physics and Elementary Particles / Kernfisika en Elementêre Deeltjies**

Module outcomes / Module uitkomst:

Knowledge:

The course follows directly on FSKS312, which deals with introductory wave mechanics. At the end of FSKS322 students have knowledge of nuclear structures and reactions, nuclear decay and models, nuclear models, groups of elementary particles, laws of conservation and the standard quark model for elementary particles.

Skills:

In the theory, emphasis is placed on formal and conceptual knowledge and applications thereof. In the practical sessions, a talk on a popular topic is required, and projects on the contents of the course are discussed. Great emphasis is placed on the correct written and oral presentation of project reports. The use of computer graphic software and word processing is learnt.

Kennis:

Hierdie kursus volg direk op FSKS312 wat oor inleidende Golfmeganika handel. Aan die einde van FSKS322 het studente kennis van kernstrukture en -reaksies, kernverval en -modelle, groepe van elementêre deeltjies, behoudswette en die standaard kwarkmodel vir elementêre deeltjies.

Vaardighede:

In die teorie word klem gelê op formele en begripskennis en toepassings daarvan. 'n Voordrag oor 'n populêre onderwerp word vereis, terwyl projekte oor die inhoud van die kursus in die praktika behandel word, waar groot klem op die korrekte skriftelike en mondelinge aanbieding van projekverslae gelê word. Rekenaargebruik van grafika-pakkette en woordverwerking word aangeleer

Module code: FSKS323**Semester 2****NQF Level: 7****Title / Titel: Astro- and Space Physics / Astro- en Ruimtefisika**Module outcomes / *Module uitkomst:***Knowledge:**

At the end of this course, students will have been introduced to distances, positions, motion, luminosity, temperature, mass, and colour of stars and the significance of these properties. Further topics are the Sun and heliosphere as prototypical stellar environment, magnetic fields of stars and planets, pulsating stars, and stellar explosions. Also of importance are the motions and acceleration of charged particles in astrospheres, as well as in astrophysical shocks.

Skills:

In the practical sessions, skills are acquired in photometric and spectral measurements using the optical telescope at Nooitgedacht.

Kennis:

Aan die einde van hierdie kursus het studente kennis gemaak met afstande, posisies, beweging, helderheid, temperatuur, massa, en kleur van sterre en die betekenis daarvan. Verdere onderwerpe is: die Son en heliosfeer as prototipiese ster-omgewing, magneetvelde van sterre en planete, pulserende sterre en sterontploffings. Ook van belang is beweging en versnelling van gelaai deeltjies in astrosfeer asook in astrofisiese skokke.

Vaardighede:

In die praktika word vaardigheid met fotometriese en spektraalmetings met die optiese teleskoop te Nooitgedacht aangeleer.

Module code: PHYM315**Semester 1****NQF Level: 7****Title: Classical Mechanics**

Module Outcomes

At the end of this module the students should be able to:

Solve dynamic problems that involve central forces, moving coordinate systems, Lagrangians as well as special relativity.

Use differential vector calculus to determine the position vector, velocity and acceleration of a particle in a moving coordinate system.

Discuss a central force field including Kepler's laws of planetary motion.

Module code: PHYM316	Semester 1	NQF Level: 7
Title: Solid State Physics		
Module outcomes At the end of this module students should be able to describe the electronic transport properties of solids and gases at the Fermi surface		
Module code: PHYM317	Semester 1	NQF Level: 7
Title: Quantum Mechanics		
Module Outcomes Acquisition of the essence of quantum mechanics which frees the student from their classical prejudices		
Module code: PHYM318	Semester 1	NQF Level: 7
Title: Project and Research		
Module Outcomes At the end of this module students are expected to be able to handle and use equipment correctly Carry out research		
Module code: PHYM321	Semester 2	NQF Level: 7
Title: Electromagnetism		
Module Outcomes Review of electrostatics Dielectrics Magnetic fields Electromagnetic induction Maxwell's equations Propagation of electromagnetic waves		
Module code: PHYM322	Semester 2	NQF Level: 7
Title: Nuclear Physics		
Module outcomes: At the end of this module students are expected to be able to: Relate experimental and theoretical work Acquire skills to solve problems in nuclear science		
Module code: PHYM323	Semester 2	NQF Level: 7
Title: Statistical Physics		
Module Outcomes At the end of this module students are expected to be able to: Use statistical concepts to derive the laws pertaining to thermal, magnetic and electric properties of matter Explain transport phenomena in matter		
Module code: PHYM324	Semester 2	NQF Level: 7
Title: Project and Research		
Module outcomes: At the end of this module students are expected to be able to handle and use equipment correctly Carry out research		

NAS.2.8.13 GEOGRAPHY / GEOGRAFIE

Module code: GEOG111 (=GGFS112)	Semester 1	NQF Level: 5
Title / Titel: Introductory to Physical Geography /		
Module outcomes / <i>Module uitkomst:</i>		
On completion of the module the student should be able to demonstrate:		
<ol style="list-style-type: none"> a basic knowledge and informed understanding of systems in climatology and geomorphology; appreciate the interactions between subsystems that include: <ol style="list-style-type: none"> in climatology: the earth's radiation balance, the climate system, southern hemisphere and southern African synoptic scale circulation.; in geomorphology: earth materials and tectonic plates; weathering and mass wasting; karst, fluvial, arid, coastal and glacial processes and landforms. the ability to explain climatic and geomorphological processes that are important in the southern African context; the ability to report on their skills in respect of identifying atmospheric circulation and geomorphological processes and landforms; appropriate practical skills including map reading, basic aerial photo interpretation and visual representation of geographical data. 		
<i>Na afhandeling van hierdie module moet studente die volgende kan demonstreeer:</i>		
<ol style="list-style-type: none"> <i>basiese kennis en ingeligde begrip van stelsels in klimatologie en geomorfologie;</i> <i>waardering van die interaksies tussen subsisteme insluitende:</i> <ol style="list-style-type: none"> <i>in klimatologie: die aarde se radiasiebalans, die klimaatsisteem, suidelike halfrond asook suidelike Afrika sinoptiese skaal sirkulasie;</i> <i>in geomorfologie: grondstowwe, tektoniese plate, verwerking en massaverplasing; karst-, fluviale-, woestyn-, kus-, gletserprosesse en -landvorme.</i> <i>die vermoë om klimaats- en geomorfologiese prosesse wat belangrik is in 'n suidelike Afrikaanse konteks, te kan verduidelik;</i> <i>die vermoë om hulle vaardighede met betrekking tot die identifisering van atmosferiese sirkulasie asook geomorfologiese prosesse en landvorme te verwoord;</i> <i>toepaslike praktiese vaardighede insluitend kartografiese vaardighede, basiese lugfotovertolking en visuele voorstelling van geografiese data.</i> 		
Module code: GEOG121 (=GGFS121)	Semester 2	NQF Level: 5
Title/ Titel: Introduction to Human Geography / Inleiding tot Menslike Geografie		
Module outcomes / <i>Module uitkomst:</i>		
On completion of the module the student should be able to demonstrate:		
<ol style="list-style-type: none"> integrated knowledge of the main areas of Human Geography, including an understanding of the key terms, concept, facts, principles, rules and theories of Human Geography. an ability to identify, evaluate and solve defined, routine and new problems within a familiar context, and to apply solutions based on relevant evidence and procedures or other forms of explanation appropriate to Human Geography. an ability to gather information from a range of sources, including oral, written or symbolic texts, to select information appropriate to the task, and to apply basic processes of analysis, synthesis and evaluation on that information in the field of Human Geography. an ability to communicate information reliably, accurately and coherently, using conventions appropriate to the context, either in writing, verbally or in practical demonstration, including an understanding of and respect for conventions around intellectual property, copyright and plagiarism in the field of Human Geography. 		

5. an ability to operate in a range of familiar and new contexts, demonstrating an understanding of different kinds of systems, their constituent parts and the relationships amongst these parts, and to understand how actions on one geographical scale can impact on other scales within the same system in Human Geography.
6. the ability to engage statistically with geographical data, to interpret the data spatially, and to present it in a comprehensible and coherent format.

Na afhandeling van hierdie module moet studente die volgende kan demonstreeer:

1. *Geïntegreerde kennis in die hoofareas van Menslike Geografie, insluitende 'n begrip van sleutel terme, konsepte, feite, beginsels, reëls en teorieë relevant tot Menslike Geografie.*
2. *Die vermoë om gedefinieerde, roetine en nuwe probleme binne bekende kontekste te identifiseer, evalueer en op te los; om oplossings toe te pas gebaseer op relevante bewyse en prosedures of ander vorme van verduideliking gepas vir Menslike Geografie.*
3. *Die vermoë om inligting van verskeie bronne, insluitende mondelinge, geskrewe of simboliese tekste, te selekteer wat gepas is vir 'n taak, asook om die basiese prosesse van analise, sintese en evaluering van daardie inligting toe te pas.*
4. *Die vermoë om inligting betroubaar, akkuraat en samehangend te kommunikeer deur gebruik te maak van konvensies wat gepas is vir die konteks, in geskrewe vorm, of verbaal, of d.m.v. praktiese demonstrasie, insluitend 'n begrip van en respek vir konvensies oor intellektuele eiendom, kopiereg en plagiaat.*
5. *Die vermoë om in 'n reeks van bekende en nuwe kontekste te kan funksioneer, deur begrip te toon van verskillende tipes stelsels, hul samestellende dele en die verbande tussen*

Module code: GEOG212 (GGFS)

Semester 1

NQF Level: 6

Title/ Titel: Physical Geography / Fisiese Geografie

Module outcomes / Module uitkomst:

On completing the module, the student should have in-depth knowledge and understanding of earth and atmospheric processes and their South African context. In particular students should be able to demonstrate:

- in-depth knowledge and understanding of South African geomorphology, including controls on landforms, examples of fluvial, sedimentary, arid and coastal geomorphology, the relationship between landscapes, mankind and environmental change;
- in-depth knowledge and understanding of South African weather and climate, including typical synoptic conditions, weather forecasting, cloud and precipitation processes;
- detailed knowledge and critical understanding of the use of observations and tools to forecast the weather, including synoptic charts, basic meteorological instrumentation, adiabatic maps like tephigrams, meteorological satellites, weather radar and the output of numerical weather models;
- demonstrate skills to interpret data from basic meteorological instrumentation and meteorological satellites by carrying out weather measurements and processing and evaluating the data; by constructing and interpreting tephigrams and performing and interpreting computer-assisted statistical operations, individually but also as member of a group;
- the ability to identify and effectively implement acceptable information gathering techniques to do research on South African climatological and geomorphological problems of limited scope, and to communicate possible solutions orally or in writing.

Aan die einde van die module moet die student in staat wees om die volgende te demonstreeer:

- *Gedetailleerde kennis van die hoofareas van Menslike Geografie, insluitende 'n begrip en toepassing van sleutelbegrippe, -konsepte, feite, beginsels, reëls en teorieë van Menslike Geografie; demonstreer ook gedetailleerde kennis van 'n spesialisarea of -areas en die wyse waarop dit verband hou met ander velde, dissiplines of praktyke.*
- *Begrip van verskillende vorme van kennis, denkskole en vorme van verduideliking wat kenmerkend is van die studieveld van Menslike Geografie, asook 'n bewustheid van kennisproduksie prosesse.*
- *Vermoë om gepaste metodes, prosedures of tegnieke soos afstandwaarnemingstegnieke in prosesse van ondersoek/navorsing te evalueer, te kies en toe te pas binne die konteks van Menslike Geografie.*
- *Die vermoë om probleme te identifiseer, te evalueer en op te los binne onbekende kontekste deur bewyse te versamel en oplossings toe te pas gegrond op bewyse en prosedures gepas vir die studieveld van Menslike Geografie.*
- *Die vermoë om verskillende inligtingsbronne te evalueer, geskikte inligting te kies en goed ontwikkelde prosesse van analise, sintese en evaluasie van daardie inligting toe te pas.*
- *Die vermoë om komplekse inligting betroubaar en samehangend aan te bied en te kommunikeer d.m.v. gepaste akademiese en professionele of beroepskonvensies, formate en tegnologieë binne die konteks van Menslike Geografie.*
- *Die vermoë om effektief individueel en in groepsverband te werk en verantwoordelikheid vir eie besluite en handelingte te neem met 'n begrip van die etiese implikasies van die genoemde besluite en aksies.*

Module code: GEOG222 (GGFS)

Semester 2

NQF Level: 6

Title/ Titek: Human Geography / Menslike Geografie

At the end of the module the student should be able to demonstrate:

- Detailed knowledge of the main areas of Human Geography, including an understanding of and an ability to apply the key terms, concepts, facts, principles, rules and theories of Human Geography; and demonstrate knowledge of an area or areas of specialisation and how that knowledge relates to other fields, disciplines or practices.
- An understanding of different forms of knowledge, schools of thought and forms of explanation typical within the field of Human Geography, and an awareness of knowledge production processes.
- An ability to evaluate, select and apply appropriate methods, procedures and techniques such as remote sensing techniques in processes of investigation or application within the context of Human Geography.
- An ability to identify, evaluate and solve problems in unfamiliar contexts, gathering evidence and applying solutions based on evidence and procedures appropriate to the field of Human Geography.
- An ability to evaluate different sources of information, to select information appropriate to the task, and to apply well-developed processes of analysis, synthesis and evaluation on that information.
- An ability to present and communicate complex information reliably and coherently, using appropriate academic and professional or occupational conventions, formats and technologies within the field of Human Geography.
- An ability to work effectively individually and in a team or group, and to take responsibility for his or her own decisions and actions with an understanding of the ethical implications of decisions and actions.
-

Na voltooiing van die module moet die studente die volgende kan demonstreeer:

- Gedetailleerde kennis van die hoofareas van Menslike Geografie, insluitende 'n begrip en toepassing van sleutelbegrippe, -konsepte, feite, beginsels, reëls en teorieë van Menslike Geografie; demonstreeer ook gedetailleerde kennis van 'n spesialisarea of -areas en die wyse waarop dit verband hou met ander velde, dissiplines of praktyke.
- Begrip van verskillende vorme van kennis, denkskole en vorme van verduideliking wat kenmerkend is van die studieveld van Menslike Geografie, asook 'n bewustheid van kennisproduksie prosesse.
- Vermoë om gepaste metodes, prosedures of tegnieke soos afstandwaarnemingstegnieke in prosesse van ondersoek/navorsing te evalueer, te kies en toe te pas binne die konteks van Menslike Geografie.
- Die vermoë om probleme te identifiseer, te evalueer en op te los binne onbekende kontekste deur bewyse te versamel en oplossings toe te pas gegrond op bewyse en prosedures gepas vir die studieveld van Menslike Geografie.
- Die vermoë om verskillende inligtingsbronne te evalueer, geskikte inligting te kies en goed ontwikkelde prosesse van analise, sintese en evaluasie van daardie inligting toe te pas.
- Die vermoë om komplekse inligting betroubaar en samehangend aan te bied en te kommunikeer d.m.v. gepaste akademiese en professionele of beroepskonvensies, formate en tegnologieë binne die konteks van Menslike Geografie.
- Die vermoë om komplekse inligting betroubaar en samehangend aan te bied en te kommunikeer d.m.v. gepaste akademiese en professionele of beroepskonvensies, formate en tegnologieë binne die konteks van Menslike Geografie.
- Die vermoë om effektief individueel en in groepsverband te werk en verantwoordelikheid vir eie besluite en handeling te neem met 'n begrip van die etiese implikasies van die genoemde besluite en aksies.

Module code: GEOG312 (GGFS)

Semester 1

NQF Level: 7

Title/ Titel: GIS and Remote Sensing / GIS en Afstandwaarneming

Module outcomes / Module uitkomst:

At the end of the module the student should be able to demonstrate:

- An integrated knowledge of and engagement in Geographical Information Systems (GIS), Geographic Information Science (GISc) and Remote Sensing (RS) and a critical understanding and application of theories and techniques relevant to GIS, GISc and RS.
- Skills in collecting, managing and applying basic analyses to geographical data by making use of appropriate GIS and image processing software
- The ability to select, apply and critically review the effectiveness of spatial data for use in spatial analysis and mapmaking.
- Critical understanding of how spatial analysis aids in management decisions
- The ability to analyse, select and effectively apply scientific research methods to address spatial problems and communicate the research findings in an academically appropriate format.

Aan die einde van die module moet die student in staat wees om die volgende te demonstreeer:

- Geïntegreerde kennis van en betrokkenheid in Geografiese Inligting Stelsels (GIS), Geografiese Inligting Wetenskap (GISc) en Afstandwaarneming (RS) en 'n kritiese begrip en toepassing van teorieë en tegnieke relevant tot GIS, GISc en RS.

- *Vaardighede om geografiese data te kan insamel, te kan bestuur en basiese analises kan toepas, deur gebruik te maak van toepaslike GIS en beeldverwerkingsprogrammatuur*
- *Die vermoë om toepaslike ruimtelike data te kan selekteer en die effektiwiteit daarvan krities te beoordeel vir die gebruik in ruimtelike analise en kaartproduksie.*
- *Kritiese begrip toon van hoe ruimtelike analise bestuursbesluite kan ondersteun*
- *Die vermoë om wetenskaplike navorsings metodes te analiseer, selekteer en effektief toe te pas op ruimtelike kwessies en die bevindinge op 'n akademiese aanvaarbare wyse te kommunikeer*

Module code: GGFS322

Semester 2

NQF Level: 7

Title: Applied Geography / Toegepaste Geografie

Module outcomes / *Module uitkomst:*

At the end of the module the student should be able to demonstrate:

- Integrated and systematic knowledge pertaining to the different components comprising the field of Geography, and insight into the manner and extent to which these different component parts interact with one another and impact on one another.
- The ability to relate and contextualise theoretical concepts to real world scenarios and problems.
- The ability to think spatially and holistically.
- The ability, as an individual and/or as a member of a group, to identify, describe and characterise problems in the field of Geography, to research relevant literature, collect and interpret data, analyse, evaluate and synthesise information and come to a meaningful conclusion, and communicate findings to peers orally and in written reports for a research project of appropriate scope.
- The ability to reflect on the values, ethical conduct and justifiability of decisions appropriate to the practice of Geography.

Aan die einde van die module moet die student in staat wees om die volgende te demonstreer:

- *Geïntegreerde en sistematiese kennis met betrekking tot die verskillende komponente waaruit Geografie bestaan, en insig in die wyse en die mate waarin hierdie verskillende komponente interaksie met mekaar toon en mekaar impakteer.*
- *Die vermoë om teoretiese konsepte met die werklikheid en regte wêreld probleme te trou.*
- *Die vermoë om ruimtelik en holisties te kan dink.*
- *Die vermoë, as individu of as lid van 'n groep, om Geografiese probleme te identifiseer, beskryf en karakteriseer; gepaste literatuursoektogte te onderneem, data te versamel, te interpreteer, inligting te analiseer, evalueer en te sintetiseer en tot 'n sinvolle gevolgtrekking te kom; en die resultate aan eweknieë te kommunikeer in verbale en/of geskrewe formaat, vir 'n navorsingsprojek van toepaslike omvang.*
- *Die vermoë om te besin oor die waardes, etiese gedrag en verdedigbaarheid van besluite wat toepaslik is vir die praktyk van Geografie*

Module code: GLGN112	Semester 1	NQF Level: 5
<p>Title / Titel: Geology and the Environment / Geologie en die omgewing</p>		
<p>Module outcomes / <i>Module uitkomst</i>:</p> <p>On completion of the module, the student should be able to demonstrate:</p> <ol style="list-style-type: none"> 1 (a) a fundamental knowledge base and informed understanding of the internal- and external geo-processes; (b) be aware of how scientific knowledge and theories are developed through the scientific method; 2. the ability to describe and identify the most common rock-forming minerals and rocks according to standard methods / description criteria; 3. the skills required to identify and analyse geological problems or potential problems and to propose and apply solutions in the light of theory-driven arguments; 4. the ability to gather research and current information by undertaking literary searches (internet, books and magazines), select information appropriate to the task and communicate information accurately and coherently, demonstrating respect for intellectual property and an understanding of plagiarism; 5. the ability to operate as part of a group/pair and to make appropriate contributions to successfully complete a task related to the identification of minerals and rocks, taking co-responsibility for learning progress and outcome realization of the group/pair; 6. the ability to assess his or her performance within a structured learning process and to take appropriate action based on feedback from tests and assignments; and 7. be aware of the ethics associated with geology, such as the exploitation of mineral deposits at the expense of the preservation of geo- and biodiversity. <p><i>Na voltooiing van die modules, moet die student kan demonstree dat hy/sy:</i></p> <ol style="list-style-type: none"> 1 (a) beskik oor 'n fundamentele kennisbasis en ingeligte begrip van die interne en eksterne geo-prosesse; (b) bewus is van hoe wetenskaplike kennis en teorieë ontwikkel deur toepassing van die wetenskaplike metode; 2. oor die vermoë beskik om die mees algemene rotsvormende minerale en gesteentes volgens standaard metodes / beskrywingskriteria te kan beskryf en identifiseer; 3. beskik oor die vaardighede wat nodig is om geologiese probleme of potensiële probleme te identifiseer en te analiseer asook om oplossings aan die hand van teorie-gedrewe argumente voor te stel en toe te pas; 4. beskik oor die vermoë om navorsing en onlangse inligting in te samel deur die onderneming van literêre soektogte (internet, boeke en joernale), inligting geskik vir die taak te selekteer asook om die inligting akkuraat en samehangend te kommunikeer, met inbegrip van plagiaat en respek vir intellektuele eiendom; 5. beskik oor die vermoë om as deel van 'n groep / paar te werk en om sinvolle bydraes te lewer tot 'n taak wat verband hou met die identifisering van minerale en gesteentes, suksesvol te voltooi, asook om mede-verantwoordelikheid vir vordering van leer en verwesenliking van uitkomst deur die groep / paar te neem; 6. die vermoë te besit om sy of haar prestasie binne 'n gestruktureerde leerproses te evalueer en om die nodige stappe wat gebaseer is op terugvoer van toetse en opdragte, te neem; en 7. bewus te wees van die etiek verbonde aan geologie, soos die ontginning van mineraalafsettings ten koste van die behoud van geo- en biodiversiteit. 		

Title / Titel: South African Geology / Suid-Afrikaanse Geologie

Module outcomes / Module uitkomst:

On completion of the module, the student is expected to demonstrate the following:

1. a fundamental knowledge base and informed understanding of the concept of geologic time, stratigraphic principles relevant to relative dating of rocks, theories relevant to the field of absolute dating of minerals and rocks, the development of the geologic time scale, and the application of the principles in the framework of South African stratigraphic units, as well as the fundamental concepts of crystallography and mineralogy;
2. the ability to describe and interpret geologic structures depicted on geologic maps, as well as the symmetry content of crystal models according to standard methods and description criteria;
3. the skills required to identify and analyse geological problems or potential problems and to propose and apply solutions in the light of theory-driven arguments;
4. the ability to gather research and current information by undertaking literary searches (internet, textbooks and journals), select information appropriate to the task and communicate information accurately, and coherently, demonstrating respect for intellectual property and an understanding of plagiarism;
5. the ability to operate as part of a pair and make appropriate contributions to successfully complete a task related to practical work, taking co-responsibility for learning progress and outcome realization of the pair;
6. the ability to assess his or her performance within a structured learning process and to take appropriate action based on feedback from tests and assignments;
7. be aware of the ethics associated with geology, such as the exploitation of mineral and rock occurrences of value for geo-conservation purposes.

Na voltooiing van die module, word van die student verwag om die volgende te kan demonstreer:

1. 'n fundamentele kennisbasis en ingeligte begrip van die konsep van geologiese tyd, stratigrafiese beginsels relevant ten opsigte van relatiewe datering van gesteente, toerieë relevant ten opsigte van die veld van absolute datering van minerale en gesteentes, die ontwikkeling van die geologiese tydskaal, en die toepassings van die beginsels in die raamwerk van die Suid-Afrikaanse stratigrafiese eenhede, asook die fundamentele konsepte van kristallografie en mineralogie;
2. die vermoë om geologiese strukture voorgestel op geologiese kaarte te beskryf en interpreteer, asook die simmetrie-inhoud van kristalmodelle volgens standaard metodes en beskrywingskriteria;
3. die vaardigheid wat vereis word om geologiese probleme of potensieële probleme te identifiseer en om oplossings in die lig van teorie-gedrewe argumente voor te stel en toe te pas;
4. die vermoë om navorsings- en byderwetse inligting te versamel deur middel van literatuursoektogte (internet, handboeke en joernale), kies inligting van toepassing op die taak en kommunikeer inligting akkuraat en samehangend terwyl respek vir intellektuele eiendom en 'n begrip van plagiaat deurgans gedemonstreer word;
5. die vermoë om as deel van 'n paar te kan werk en gepaste bydraes lewer om 'n taak wat verband hou met praktiese werk, suksesvol af te handel, deur medeverantwoordelikheid te neem vir vordering in leer en realisering van uitkoms deur die paar;
6. die vermoë om sy of haar werkverrigting te assesseer binne 'n gestruktureerde leerproses en om gepaste aksie te neem gebaseer op terugvoer van toetse en opdragte;

7. bewus te wees van die etiek geassosieer met geologie, soos die uitbuiting van mineraal en gesteentevorkomste van waarde vir 'n geo-bewaringsdoel

Module code: GLGN211

Semester 1

NQF Level: 6

Titl / Titel e: **Mineralogy en Igneous Petrology / Mineralogie en stollingspetrologie**

Module outcomes / Module uitkomst:

On completion of this module, the student should be able to demonstrate:

- detailed knowledge and understanding of: a variety of rock-forming and economic minerals, as well as a variety of igneous rock associations and associated rock-forming processes; the chemical, structural and optical aspects of various minerals and igneous rocks, accompanying analysis techniques, and the graphical representation thereof; the identification and systematic description of the major rock-forming minerals and most common igneous rocks;
- the skill required to analyse, synthesise and evaluate tendencies in changes with regard to the structure and composition of minerals and rocks; identification and systematic classification of rocks and minerals;
- the skill required to apply the investigation method of polarising petrographic microscopy, in order to identify and classify minerals and rocks in thin sections; analyse proposed models for the origin of particular igneous rock associations;
- the ability to conduct accurate and reliable literary searches, to analyse, interpret and synthesise the information and to use it to make proposals to solve problems in both familiar and new contexts;
- the ability to coherently communicate reporting, either individually or in group context, verbally, written or in digital format, to a group of peer learners with the help of IT; and
- ethical consciousness and accountability with regard to the collection of rock material for geological investigation, use of appropriate analytical techniques, presentation of geological data, the interpretation thereof, and reporting in written format according to scientific / academic standards with the understanding of intellectual property, copyright and rules on plagiarism.

Ná voltooiing van hierdie module moet die student die volgende kan demonstreer:

- *gedetailleerde kennis en begrip van: 'n verskeidenheid gesteentevormende en ekonomiese minerale, asook 'n verskeidenheid stollingsgesteente-assosiasies en gepaardgaande gesteentevormende prosesse; die chemiese, strukturele, en optiese aspekte van verskeie minerale en stollingsgesteentes, gepaardgaande ontledingstegnieke, en die grafiese voorstelling daarvan; die identifisering en sistematiese beskrywing van die hoof gesteentevormende minerale en algemeenste stollingsgesteentes;*
- *vaardigheid vereis om neigings in veranderinge ten opsigte van die struktuur en samestelling van minerale en stollingsgesteentes te kan analiseer, sintetiseer en evalueer; identifisering en sistematiese klassifisering van gesteentes en minerale;*
- *vaardigheid vereis om polariserende petrografiese mikroskopie toe te pas om minerale en gesteentes in slypplaatjies te ondersoek, identifiseer en klassifiseer; om voorgestelde modelle vir die oorsprong van bepaalde stollinggesteente-assosiasies te kan analiseer;*
- *die vermoë om akkurate en betroubare literatuursoektogte te onderneem, die inligting te analiseer / ontleed, interpreteer, sintetiseer en gebruik om voorstelle te maak en probleme op te los in bekende asook nuwe kontekste;*
- *die vermoë om 'n verslag samehangend te kommunikeer, individueel of in groepsverband, mondelings, geskrewe of in digitale formaat met behulp van IT, aan 'n groep eweknie-leerders ; en*

- *etiese bewussyn en aanpreeklikheid in verband met die versameling van gesteentemateriaal vir geologiese ondersoek, gebruik van gepaste ontledingstegnieke, aanbieding van geologiese data, interpretasie daarvan, en verslaggewing in geskrewe formaat met begrip vir intellektuele eiendom, kopiëring en plagiaatreëls volgens wetenskaplike / akademiese standaarde.*

Module code: GLGN221

Semester 2

NQF Level: 6

Title / Titel: Sedimentology, Structural Geology and Neotectonics / Sedimentologie, struktuurgeologie en neotektoniek

Module outcomes / *Module uitkomst:*

On completion of the module, the student should be able to demonstrate:

- (a) detailed knowledge and understanding of - (a) key terms, concepts, facts, principles, rules, theories, etc. within the fields of sedimentology, structural geology, and neotectonics;
(b) how knowledge of sedimentology, structural geology, and neotectonics relates to applicable knowledge within the field of environmental geology; and (c) the origin and development of knowledge within the fields of structural geology and sedimentology results in critical understanding of schools of thought, within the field of geology and environmental applications;
- the ability to select, evaluate and effectively implement/apply, with discernment, those standard procedures/rules/methods/formulas/skills etc. to solve fundamental problems in a defined environment in the field of sedimentology and structural geology, with a view to conceptualize areas of interest;
- ability to distinguish and solve sedimentological and structural problems in unfamiliar contexts and to apply the solutions to support progress/development in the practice of environmental geology, in order to integrate the relationship between structural and sedimentological setting, resources and associated environmental impacts;
- understand the ethical implications of decisions, actions and practices specifically relevant to field and practical sessions, in accordance with the rules of practice;
- (a) the ability to gather discipline-specific information, methods and techniques from credible and relevant discipline-related scientific sources; analyse, evaluate and synthesize the information and apply your conclusions/research to a given context in the fields of structural geology and sedimentology;
(b) accurate and coherent written and verbal communication of theoretical information/tasks/projects etc. with understanding of and respect for intellectual property conventions, copyright and rules on plagiarism;
- act as group member and a group leader and contribute appropriate information/skills to successfully complete a task/project/profile etc., measuring the success of the task completion against given criteria, taking co-responsibility for learning progress and outcome realization of the group; and
- monitor own learning progress and apply relevant learning strategies and known and new resources to successfully realize all outcomes of this module.

Na voltooiing van die module moet die student beskik oor:

- (a) 'n indiepte kennis en begrip van - (a) kern terme, konsepte, feite, beginsels, reëls, teorieë, ens binne die velde van sedimentologie, struktuurgeologie, en neotektoniek;
(b) hoe kennis van sedimentologie, struktuurgeologie, en neotektoniek verband hou met toegepaste kennis binne die veld van omgewingsgeologie; en (c) die ontstaan en ontwikkeling van kennis binne die velde van struktuurgeologie en sedimentologie, bydrae

tot kritieke begrip van denkrigtings binne die gebied van geologie en omgewingstoepassings;

- 2. die vermoë om die standaard prosedures/ reëls/metodes/formules/vaardighede ens, benodig om fundamentele probleme in 'n bepaalde omgewing in die gebied van sedimentologie en struktuurgeologie op te los, met onderskeiding te kies, te evalueer en effektief te implementeer/toe te pas met die oog op konseptualisering van gebiede van belang;*
- 3. vermoë om sedimentologiese en strukturele probleme in onbekende kontekste te onderskei en op te los en om oplossings wat vordering/ontwikkeling in die praktyk van omgewingsgeologie ondersteun toe te pas ten einde integrasie van die verhouding tussen die strukturele en sedimentologiese omgewing, hulpbronne en gepaardgaande omgewingsimpakte;*
- 4. begrip van die etiese implikasies van besluite, optrede en praktyke wat spesifiek op die veldwerk en praktiese sessies betrokke is, in ooreenstemming met die reëls van die praktyk;*
- 5. (a) die vermoë om dissipline-spesifieke inligting, metodes en tegnieke van geloofwaardige en relevante dissipline verwante wetenskaplike bronne in te samel; te analiseer, te evalueer en die inligting saam te vat om daarvolgens gevolgtrekkings/navorsing toe te pas in 'n gegewe konteks in die velde van struktuurgeologie en sedimentologie;*
(b) akkurate en samehangende geskrewe en verbale kommunikasie van teoretiese informasie/take/projekte ens. met 'n begrip van en respek vir intellektuele eiendom konvensies, kopiereg en reëls oor plagiaat;
- 6. die vermoë om op te tree as lid van 'n groep en 'n groepleier en dra toepaslike inligting / vaardighede by om 'n taak / projek / profiel suksesvol te voltooi ens, die sukses van die taak voltooiing teen gegewe kriteria te kan meet, en mede-verantwoordelikheid vir die leer proses en uitkoms verwesenliking van die groep kan neem; en*
- 7. eie leervordering te monitor en relevante leerstrategieë, bekende en nuwe hulpbronne te kan aanwend om suksesvol al die uitkomst van hierdie module te bemeester*

Module code: GLGN311

Semester 1

NQF Level: 7

Title / Titel: Metamorphic Petrology and Geochemistry / Metamorfe petrologie en geochemie

Module outcomes / Module uitkomst:

On completion of the module, the student is expected to demonstrate the following:

- 1) integrated knowledge and understanding of, as well as ability to correctly evaluate and apply concepts and principles to different areas of specialization within the fields of metamorphic petrology and geochemistry and an understanding of how that knowledge relates to these fields;
- 2) understanding of contested knowledge within the field of metamorphic petrology and geochemistry, and a critical evaluation of the applicability of aforementioned concepts and principles to the field of metamorphic petrology and geochemistry;
- 3) ability to select, evaluate and apply a range of different but appropriate theories and scientific methods of research;
- 4) reflection of all values, and ethical conduct and justifiable decision making appropriate to the practice of research in the fields of metamorphism and geochemistry of rocks;
- 5) ability to identify, analyse, and critically reflect on and address complex metamorphic and geochemical problems and apply evidence-based solutions with theory-based arguments, and communicate in an accurate and coherent manner, written and verbal, with understanding of and respect to intellectual property conventions, copyright and rules on plagiarism; and

6) management of a group in an unfamiliar context in order to solve a contextual problem (explain type), monitoring the progress of the group and taking responsibility for task outcomes and application of appropriate resources as necessary.

Na voltooiing van die module, moet 'n student die volgende demonstree:

- 1) *geïntegreerde kennis en begrip van, asook vermoë om konsepte en beginsels korrekte te evalueer en toe te pas op verskillende spesialisgebiede in die velde van metamorfe petrologie en geochemie, en 'n begrip hoe daardie kennis verband hou met hierdie velde;*
- 2) *begrip van betwiste kennis in die veld van metamorfe petrologie en geochemie, en 'n kritiese evaluering van die toepassing van voorheen genoemde konsepte en beginsels in die veld van metamorfe petrologie en geochemie;*
- 3) *vermoë om 'n verskeidenheid, maar gepaste toerieë en wetenskaplike navorsingsmetodes te kies, evalueer en toe te pas;*
- 4) *weerspieël al die waardes en etiese gedrag, en regverdigbare besluitneming gepas in die navorsingspraktyk in die veld van geochemie;*
- 5) *vermoë om komplekse metamorfe en geochemiese probleme te identifiseer, analiseer, en krities daaroor te besin en te hanteer, en om bewysgebaseerde oplossings met teoriegebaseerde argumente toe te pas, en op 'n akkurate en samehangende manier, geskrewe en verbaal, met begrip van en repsek vir gebruike in intellektuele eiendom, kopiereg en reëls ten opsigte van plagiaat; en*
- 6) *werk saam in 'n groep in 'n onbekende konteks om 'n kontekstuele probleem op te los, monitor die vordering van die groep en neem verantwoordelikheid vir taakuitkomste en toepassing van gepaste hulpmiddels soos nodig.*

Module code: GLGN321

Semester 2

NQF Level: 7

Title / Titel: Hydrogeology / Hidrogeologie

Module outcomes / Module uitkomst:

On completion of the module, the student should be able to demonstrate:

1. integrated knowledge and understanding of, as well as an ability to correctly evaluate and apply principles of hydrogeology and engineering geology to different areas of specialization within the field of environmental geology, and an understanding of how that knowledge relates to other fields or practices within other disciplines with a view to access and solve environmental problems;
2. ability to select, evaluate and apply a range of different but appropriate procedures/rules/methods/formulas/theories and scientific methods of enquiry to do focused research and resolve problems that will effect change within practice;
3. ability to identify, analyse, critically reflect on and address complex groundwater and engineering geology problems and apply evidence-based/practice-driven/proven solutions with theoretically-driven arguments;
4. (a) reflection of all values, ethical conduct and justifiable decision making processes appropriate to the practice of hydrogeology, engineering geology, and geophysics; and
(b) understanding of the ethical implications of decisions, actions and practices specifically relevant to field and practical sessions, in accordance with the rules of practice;
5. accurate and coherent written and verbal communication of projects with understanding of and respect for intellectual property conventions, copyright and rules on plagiarism;
6. management of a group in an unfamiliar context in order to solve a contextual problem (explain type), monitoring the progress of the group and taking responsibility for task outcomes and application of appropriate resources where appropriate; and

7. take full responsibility for own learning needs, monitoring of own learning progress and application of relevant learning strategies and management of all resources to successfully realize all outcomes of this module.

Na suksesvolle voltooiing van die module, moet die student beskik oor:

1. geïntegreerde kennis en begrip van, sowel as 'n vermoë om korrek te evalueer en beginsels van hidrogeologie en ingenieursgeologie, verskillende spesialiseringstrings binne die veld van omgewingsgeologie toe te pas, en 'n begrip toon van hoe daardie kennis verband hou met ander veldde of praktyke binne ander dissiplines met die oog daarop om omgewingsprobleme te betree en op te los;
2. die vermoë om 'n verskeidenheid van verskillende maar toepaslike prosedures/reëls/metodes/formules/teorieë en wetenskaplike metodes van ondersoek te kies, te evalueer en toe te pas om gefokusde navorsing te doen en probleme op te los wat verandering/vordering binne die praktyk sal bevorder.
3. die vermoë om komplekse grondwater en ingenieursgeologie probleme te identifiseer, te analiseer, krities te besin en aan te spreek asook om bewysgebaseerde/praktykgerigte oplossings toe te pas gemotiveer deur teoreties-ondersteunde argumente;
4. (a) die vermoë om te reflekteer oor alle waardes, etiese optrede en regverdigbare besluitnemingsprosesse wat geskik is vir die praktyk van hidrogeologie, ingenieursgeologie, en geofisika;
(b) begrip toon van die etiese implikasies van besluite, optrede en praktyke wat spesifiek op die veldwerk en praktiese sessies gerig is, soos in ooreenstemming met die reëls van die praktyk;
5. akkurate en samehangende geskrewe en verbale kommunikasie van projekte met 'n begrip van en respek vir intellektuele eiendom konvensies, kopiëreg en reëls oor plagiaat;
6. bestuur van 'n groep in 'n onbekende konteks ten einde 'n kontekstuele probleem op te los (verduidelik tipe), die monitering van die vordering van die groep en verantwoordelikheid neem vir taak uitkomst en toepassing van geskikte hulpbronne, waar gepas; en
7. neem volle verantwoordelikheid vir eie leerbehoefes, monitering van eie leervordering en toepassing van relevante leerstrategieë en bestuur van alle hulpbronne om al die uitkomst van hierdie module suksesvol te bemeester

NAS.2.8.15 SOIL SCIENCE / GRONDKUNDE

Module code: GDKN121	Semester 2	NQF Level: 5
Title / Titel: Introduction to Soil Science / Inleidende grondkunde		
Module outcomes / <i>Module uitkomst:</i>		
On completion of the module, the student should be able to demonstrate:		
<ol style="list-style-type: none"> 1. an informed understanding of pedogenesis, soil forming factors and basic fundamental principles in soil science; 2. the skill to differentiate, identify and classify soil horizons and soil forms within the contexts of South African soils and the standard South African classification procedures; 3. the ability to demonstrate the relation between the various soil components and how the interaction between these components affects general soil health and performance; 4. the ability to gather research and current information by undertaking literary searches (internet, books and magazines), select information appropriate to tasks and communicate information accurately and coherently while demonstrating respect for intellectual property and an understanding of plagiarism; 5. the ability to assess his or her performance within a structured learning program and to take appropriate action based on feedback from tests and assignments; and 		

6. be aware of his/her personal ethical framework.

Na voltooiing van die module moet die student:

1. 'n ingeligte begrip van pedogenese, grondvormende faktore en basiese fundamentele beginsels in grondkunde toon;
2. beskik oor die vaardigheid om grondhorisonte en grondvorms binne die konteks van Suid-Afrikaanse grond te onderskei, te identifiseer en volgens die standaard Suid-Afrikaanse klassifikasie prosedures te klassifiseer;
3. die vermoë om die verhouding tussen die verskillende grondkomponente en hoe die interaksie tussen hierdie komponente beïnvloed algemene gesondheid en prestasie grond te demonstreer;
4. beskik oor die vermoë om navorsing en relevante inligting in te samel deur die onderneming van literêre soektogte (internet, boeke en tydskrifte), inligting wat toepaslik is vir take te selekteer en hierdie inligting akkuraat en samehangend te kommunikeer met inbegrip van plagiaat en respek vir intellektuele eiendom;
5. beskik oor die vermoë om sy of haar prestasie binne 'n gestruktureerde leerprogram te evalueer en om die nodige stappe, gebaseer op terugvoer van toetse en opdragte, te neem;
6. en bewus te wees van sy / haar persoonlike etiese raamwerk.

Module code: GDKN211

Semester 1

NQF Level: 6

Title / Titel: Advanced Soil Science / Gevorderde grondkunde

Module outcomes / Module uitkomst:

On completion of the module, the student should be

- Detailed knowledge of: soil mineralogy, soil chemistry, plant nutrition and soil physics.
- Understanding of and an ability to apply key terms, concepts, facts, principles, rules and theories of soil science.
- Evaluate, select and apply appropriate soil chemical procedures to solve soil environmental problems
- Identify and solve problems related to soil as a three-phase system.
- Evaluate soil analytical data and use that information to make fertilizer recommendations. Present and communicate the fertilizer recommendations made to the interested party in an academic and professional format.
- Make decisions and act appropriately in soil related matters with an understanding of the relationships between soil mineralogy, soil chemistry and soil physics.
- Work effectively in a team or group, and to take responsibility for his or her decisions and actions and the decisions and actions of others within well-defined contexts, including the responsibility for the use of soil as an important resource.

Na voltooiing van die module behoort die student

- *In diepte kennis van grondmineralogie, grondchemie, plantvoeding en grondfisika.*
- *Verstaan en toepassing van grondkundige beginsels, terme en konsepte.*
- *Evaluering en dan toepassing van grondchemiese prosesse om grondomgewings probleme op te los.*
- *Probleme op te los van grond as 'n drie-fase sisteem.*
- *Grondontledingsdata te gebruik om bemestingsaanbevelings te maak en dit in 'n professionele verslag weer te gee.*
- *Besluite te maak en op te tree in grond verwante sake met die nodige kennis van grondmineralogie, grondchemie en grondfisika.*
- *Om effektief as 'n span te kan werk en verantwoordelikheid te vat vir besluite gemaak ten opsigte van grond as 'n belangrike hulpbron*

Module code: GDKN221	Semester 2	NQF Level: 6
Title / Titel: Soil Degradation and Rehabilitation / Gronddegradasie en rehabilitasie		
Module outcomes / <i>Module uitkomst:</i>		
On completion of this module, you should be able to demonstrate the following:		
<ul style="list-style-type: none"> • To distinguish between natural and anthropogenic soil degradation in terms of origins and factors that lead to soil degradation. • Identify soil pollution on the basis of physical and chemical analysis and determine what types of analyses are applicable in the case of field investigations. • Explain the impact of pollution and degradation on the chemical, physical and mechanical properties and general land uses of soils. • Use remote sensing techniques to identify soil degradation. • Remedial measures to avoid soil degradation, and to recover degraded soil. • Identify and/or develop potential rehabilitation programs, describe the implications of soil degradation and pollution with reference to practical field observations. • Development of sustainable land use management systems. • Development of Environmental Risk analysis for different land uses. • Do practical soil surveys in the field with an emphasis on identifying soil degradation and pollution and risk management. 		
<i>Ná voltooiing van hierdie module moet jy die volgende te kan demonstreer:</i>		
<ul style="list-style-type: none"> • <i>onderskeid te kan tref ten opsigte van natuurlike en antropogenetiese gronddegradasie ten opsigte van oorsprong en faktore wat aanleiding gee tot gronddegradasie.</i> • <i>Besoedeling van grond te kan identifiseer aan die hand van fisiese en chemiese analises en self te kan bepaal watter tipes analises is van toepassing in die geval van veld ondersoeke.</i> • <i>Kan verduidelik wat die invloed van besoedeling en degradasie is op die chemiese, fisiese en meganiese eienskappe en algemene grondgebruike.</i> • <i>Afstandswaarnemingstegnieke te kan gebruik om gronddegradasie te kan uitken en identifiseer.</i> • <i>Remediërende maatreëls kan voorstel om degradasie teen te werk, te voorkom en te kan herstel.</i> • <i>Implikasies van gronddegradasie en besoedeling in veldverband kan identifiseer en potensieële rehabilitasie programme kan identifiseer of ontwikkel</i> • <i>Volhoubare grondgebruiksbestuur-stelsels kan ontwikkel.</i> • <i>Omgewingsrisiko-analises kan ontwikkel vir verskillende grondgebruike.</i> • <i>Praktiese grondopnames in die veld kan doen met die klem op identifisering van gronddegradasie en besoedeling en risikobestuur.</i> 		
Module code: GDKN311	Semester 1	NQF Level: 7
Title / Titel: Soil Genesis and Classification / Grond Genese en Klassifikasie		
Module outcomes / <i>Module uitkomst:</i>		
After completion of this module the student should be able to:		
<ul style="list-style-type: none"> • Demonstrate detailed knowledge, understanding and insight regarding soil classification and the ability to apply it practically. • Know how soils are classified as natural bodies on the basis of their profile characteristics and not merely on the basis of their suitability for a particular use. • Understand and describe basic principles of soil genesis soil-forming factors and processes related to agricultural and broader soil science applications. • Understanding the interaction between the different factors and processes and the end land use. • By understanding these processes and factors the students will be able to predict how soil will be affected by the addition of chemical fertilisers, cultivation and climate change within the South African context. 		

- Describe the physical breakdown and the chemical alteration and diagenesis of parent material i.e. primary minerals to secondary soil-forming minerals.
- Demonstrate detailed knowledge and practical application of the taxonomic system as applicable in South Africa.
- Identify and classify soil forms according to this classification system to better understand and make sense of the variability that occurs within the soils and how this apply to the use of the soil in South Africa.

Module code: GDKN322

Semester 2

NQF Level: 7

Title / Titel: Soil Physics / Grondfisika

Module outcomes / *Module uitkomst:*

After completion of this module the student should be able to:

- Identify and solve problems related to soil as a three-phase system.
- Demonstrate knowledge of soil water dynamics including the Law of Darcy concerning the flow of water in soil i.e. saturated and unsaturated water flow.
- Demonstrate a detailed understanding the movement of solutes through the soil profile.
- Demonstrate a detailed understanding regarding the gas content, composition, movement and exchange in the soil.
- Thorough knowledge and insight regarding the physical reaction of the solid fraction with water and air.
- Demonstrate a systematic overview of soil hydraulics including various aspects of soil water such as infiltration, run-off, base flow etc.
- Demonstrate an understanding and detail comprehension of what capillary and diffusion flow are.
- Demonstrate an understanding and describe water balances in term of ET, infiltration, precipitation etc.
- Identify processes and factors of plant available water with regards to soil as an entity.
- Demonstrate an in depth knowledge, understanding and insight regarding soil physics in agricultural systems, as well as the ability to apply it practically.

Module code: GDKN421

Semester 2

NQF Level: 8

Title / Titel: Sustainable soil management (precision farming) / Presisieboerdery

Module outcomes / *Module uitkomst:*

After completion of this module the student should be able to:

- Demonstrate knowledge of control and management aspects (basic principles of project management) and be able to apply it practically.
- Demonstrate a detailed understand of information technology (GIS, remote sensing, satellite images, geo-spatial technology, on-the-go info, etc.) and to explain and implement it practically.
- Identify, explain and implement farm machinery (hardware) and software for use in precision farming.
- Integrate fundamental knowledge and understanding of soil surveys and fertilizer recommendations.
- Demonstrate fundamental knowledge and applications of statistics in precision farming.
- Identify and explain sustainable soil and land management methods.
- Demonstrate detailed knowledge and understanding of the integration and modelling of environmental (climate, irrigation, cultivar choice fertilization, agronomy, yield potential, etc.) and management variables (sustainability of complex systems).

- Demonstrate complete knowledge, understanding and insight in regard to sustainable soil management and the means to apply it practically.
- Demonstrate practically application through integration of all the previous modules, survey data and all aspects of GDKN 421 (as discussed above, as well as with "real-time DSS", for Agronomy to complete a suitable project.

*FIELD MAPPING DURING THE DECEMBER HOLIDAY OF THE 3RD YEAR IS A PREREQUISITE FOR 4TH YEAR REGISTRATION.

The field mapping include fieldwork and soil mapping with regards to the application of basic field techniques, sampling, soil mapping techniques, application of the South African taxonomic classification system, certain laboratory analysis of field samples, fertiliser applications, data interpretation and report writing.

- Demonstrate understanding and insight regarding various classification systems and their practical applications;
- Map soil information by means of geographical information systems (GIS) for application in precision farming and modelling in which different environmental and management attributes are integrated.

NAS.2.8.16 INFORMATION TECHNOLOGY / INLIGTINGSTEGNOLOGIE

Module code: CISM213	Semester 1	NQF Level: 6
Title: Algorithmic Design and Structures		
Content: Basic algorithm analysis, algorithm strategies, fundamental computing algorithms, distributed algorithms, graphs and trees, fundamental data structures and recursion.		
Outcomes: Describe and explain algorithms concepts and methods. Define, explain and apply problem solving using algorithms. Develop computing solutions for the algorithms using a programming language. Create and manipulate static data structures and dynamic data structures. Develop methods for traversal of trees.		

Module code: CISM214	Semester 1	NQF Level: 6
Title: Imperative and Object-Oriented Programming		
Content: Imperative programming with procedures, modules and pointers, Hash tables and Binary trees. state and state change; declarations; basic statements; typed languages: simple algorithms and their implementation. Elements of the object model. Class encapsulation, Messages, inheritance and polymorphism, object storage management, and exception handling.. Abstraction, levels of abstraction. Encapsulation and interchangeability, modularity and hierarchy. Patterns, Procedures, Modules. Behaviour and State, Structural and behavioral diagrams, Instances, Classes and Methods, Classes as Objects and Initialization.		
Outcomes A student successfully completing this module should be able to: demonstrate understanding of the basic principles of imperative programming and its structure; use the basic concepts of Object Oriented Programming and write simple programs in Object environment as a problem solving tool.		

Module code: CISM225	Semester 2	NQF Level: 6
Title: Introduction to operating systems		
Content: Overview of operating systems. Operating system structure. Process management. Processes, CPU Scheduling and Process Synchronization. Concurrency and synchronization. Concurrent execution; Mutual exclusion problem and some solutions Deadlock; Models and mechanisms (Semaphones, monitors etc.). Multiprocessor issues. Scheduling. Deadlock and Starvation. Processor management. Scheduling and dispatch. Memory management. Virtual memory. Device management. File systems. Security, privacy and acceptable. Memory Management: Swapping and Partitions, Paging &Segmentations.		
Outcomes: A student successfully completing this module should be able to: demonstrate understanding of the services an operating system provides to users, processes, and other systems; discuss the various ways of structuring an operating system, demonstrate how operating systems are installed and customized and how they boot; explain communication in Client-Server Systems.		
Module code: CISM226	Semester 2	NQF Level: 6
Title: Introduction to Software Engineering		
Content: Software design, software tools and environments, software processes, software requirements and specifications, software validation, software evolution and software project management.		
Outcomes: Describe software engineering and its process. Describe and apply different software development methodologies to solve problems. Implement a solution using the appropriate software development methodology. Develop and validate a basic system using a DBMS using software requirements and specifications. Write software engineering documentation such as reports, and user manuals.		
Module code: CISM313	Semester 2	NQF Level: 6
Title: Introduction to Database Systems		
Content: Information models and systems, database systems, data modelling, relational database, database query languages and relational database design. Database Management Systems; DBMS storage structures. Relational algebra and relational calculus; SQL; query optimisation; views. Database Design: UML Class Diagrams and Entity-Relationship Diagrams; UML Sequence Diagrams; conceptual, logical and physical database design.		
Outcomes: Describe nature and scope of database system. Explain and apply information models and systems to address everyday problems. Describe and explain data modelling concepts and techniques. Design a relational database. Develop a DBMS and manipulate it using a data manipulation language.		

Module code: CISM314	Semester 1	NQF Level: 7
Title: Principles of Compiler Design		
<p>Content: Introduction to Compilation. General structure of a Compiler. Overview of compilation technology. Phases of Compilation – Lexical, Syntax and Semantic Analysis, Language translation systems. Parsing techniques. Run-time environments. Syntax-directed translation. Intermediate code generation and optimization. Regular Expressions, Finite-state Machines – DFA and NFA. Type Checking, Intermediate Code generations and Scanner generator tools, Grammars and Languages, Tokens, Lexeme</p> <p>Outcomes: A student successfully completing this module should be able to: describe the principles governing all phases of the compilation process; explain the role of each of the basic components of a standard Compiler; analyse the problems of and apply the methods and techniques to each phase of the compilation process; Apply standard techniques to solve basic problems that arise in compiler construction; explain how the Compiler can take advantage of particular processor characteristics to generate good code</p>		
Module code: CISM327	Semester 2	NQF Level: 7
Title: Data Communication and Networks		
<p>Content: Introduction to net-centric computing, Basics of networking architecture, Application layer protocols, including HTTP. Naming, including domain name system. Transport protocols, including TCP.. network security, the web as an example of client-server computing, building web applications, and network management.</p> <p>Outcomes: Describe and explain the different network components and their uses (importance). Describe, explain and differentiate telecommunications technologies. Install, configure and maintain network. Develop web applications. Describe and explain the social issues of networks and ways of dealing with them.</p>		
Module code: CISM326	Semester 2	NQF Level: 7
Title: Artificial Intelligence Fundamentals		
<p>Content: Fundamental issues in intelligent systems, search and constraint satisfaction, knowledge representation and reasoning, advanced search, advanced knowledge representation and reasoning.</p> <p>Outcomes: Describe and explain the nature and scope of artificial intelligence. Describe fundamental issues in intelligent systems. Design patterns for searching and apply searching and constraints satisfaction to draw inferences and conclusions. Design patterns for application of knowledge representation and reasoning. Implement different artificial intelligence applications.</p>		

Module code: CMPG111	Semester 1	NQF Level: 5
Title / Titel: Introduction to computing and programming / Inleiding tot rekenaarwese en programmering		
<p>Module outcomes / <i>Module uitkomst:</i> After the successful completion of this module, the student should demonstrate: Knowledge scope: basic / fundamental / elementary knowledge / informed understanding</p> <ul style="list-style-type: none"> • fundamental knowledge of the main areas of the computer science discipline including system areas and application areas. <p>Methods and procedures: identify, select, organise and implement standard methods / procedures / rules / formulas</p> <ul style="list-style-type: none"> • the ability to identify, select and implement standard procedures and methods related to the manipulation of spreadsheets and database tables with a view to organise, process and present data and transfer data between different applications; • the ability to identify, select and implement standard structured programming methods related to computer programming with a view to solve simple computational problems. <p>Practical skill: demonstrate / implement / apply a basic practical skill</p> <ul style="list-style-type: none"> • the ability to apply knowledge of tables, computations and functions in order to manipulate data on spreadsheets and database tables; <p>Basic problem solving skill</p> <ul style="list-style-type: none"> • the ability to identify, analyse and define basic problems specific to the field of computer programming. • the ability to select from a range of possible options the best solution to a discipline-specific problem and to apply the solution to support progress in the practice of designing and implementing structured programs. <p>Identify ethical and professional behaviour</p> <ul style="list-style-type: none"> • identify social and ethical issues in the field of IT. <p><i>Na afloop van die suksesvolle voltooiing van hierdie module, behoort die student die volgende te kan demonstreer:</i></p> <p><i>Kennisbasis: basies / fundamenteel / elementêre kennis / ingeligte begrip</i></p> <ul style="list-style-type: none"> • <i>fundamentele kennis van die hoofareas van die rekenaarwetenskapdissipline insluitend stelsel- en toepassingsareas</i> <p><i>Metodes en prosedures: identifiseer, selekteer, organiseer en implementeer standaard metodes / prosedures / reëls / formules</i></p> <ul style="list-style-type: none"> • <i>die vermoë om standaardprosedures en -metodes in verband met die manipulasie van sigblaaië en databasisse te identifiseer, selekteer en te implementeer, om data sodoende te organiseer, verwerk, voor te stel en tussen verskillende toepassings oor te dra;</i> • <i>die vermoë om standaard gestruktureerde programmeringsmetodes te identifiseer, selekteer en te implementeer, om sodoende eenvoudige probleme met die rekenaar op te los.</i> <p><i>Praktiese vaardigheid: demonstreer / implementeer / pas 'n basiese praktiese vaardigheid toe</i></p> <ul style="list-style-type: none"> • <i>die vermoë om kennis van tabelle, berekeninge en funksies toe te pas om sodoende data op sigblaaië en databasistabelle te manipuleer.</i> <p><i>Basiese probleemoplossingsvaardighede</i></p>		

- die vermoë om basiese probleme, spesifiek tot die veld van rekenaarprogrammering, te identifiseer, ontleed en te definieer;
- die vermoë om die beste oplossing uit 'n versameling moontlikhede van 'n dissipline-spesifieke probleem te kies en om deur toepassing van die oplossing die praktyk van ontwerp en implementering van gestruktureerde programme te bevorder.

Identifiseer etiese en professionele gedrag

- identifiseer sosiale en etiese kwessies in die veld van IT.

Module code: CMPG112 = (ITRW112/CISM112)

Semester 1

**NQF
Level: 5**

Title / Titel: Introduction to end user computing / Inleiding tot rekenaareindgebruik

Module outcomes / *Module uitkomst:*

On completing this module, the students should be able to:

1. demonstrate fundamental knowledge of the different components of a computer and an information system, as well as programming languages and their uses;
2. demonstrate the manipulation of spreadsheets by applying knowledge of tables, computations, transfer of data between different applications, functions and graphic presentations;
3. demonstrate the ability to solve problems by designing and implementing structured programming, by using data manipulation and data presentations and applying 'GUI' event-driven approaches in the development environment of a spreadsheet;
4. demonstrate insight into ethical issues related to the wider IT business and an awareness of the risks and dangers that threaten the business;
5. demonstrate the ability to communicate in writing by compiling a report after having completed a project

Na voltooiing van hierdie module behoort die studente in staat te wees om:

1. fundamentele kennis te demonstreeer van die verskillende komponente van 'n rekenaar en van 'n inligtingstelsel, asook programmeringstale en gebruik daarvan.
2. die manipulering van sigblaai te kan demonstreeer deur toepassing van kennis van tabelle, berekenings, oordrag van data tussen verskillende toepassings, funksies en grafiese voorstelling;
3. die vermoë te demonstreeer om probleme op te los deur ontwerp en implementering van gestruktureerde programmering, gebruik van datamanipulasie en datavoortellings en toepassing van "GUI" gebeurtenis gedrewe (event-driven) benadering in 'n sigblad se ontwikkelingsomgewing;
4. insig in etiese kwessies wat verwant is aan die breër IT-bedryf te verstaan en bewus wees van die risiko en gevare wat die bedryf bedreig;
5. skriftelike kommunikasievermoë te demonstreeer deur 'n verslag op te stel nadat 'n projek voltooi is

Module code: CMPG115 (=ITRW115)	Semester 1	NQF Level: 5
Title / Titel: Programming for Engineers I / Programmering vir ingenieurs I		
<p>Module outcomes / <i>Module uitkomst</i>: On completion of this module, the student should be able to demonstrate a thorough knowledge of, and skill in the underlying principles, methods and the application of the following topics:</p> <ul style="list-style-type: none"> • Knowledge of and insight in the basic structure, data types, and functions, including structured problem solving and debugging, testing and execution of applications of a structured programming language. • The student will have to demonstrate that he/she can apply the acquired knowledge and insight to solve elementary problems, develop an algorithm to solve problems, codify the algorithm, and to debug, test and execute it on the computer. <p><i>Na voltooiing van die module, behoort die student 'n deeglike kennis van, en vaardigheid in die onderliggende beginsels, metodes en toepassing van die volgende onderwerpe te kan demonstreeer:</i></p> <ul style="list-style-type: none"> • <i>Basiese kennis en insig te hê oor 'n gestruktureerde programmeringstaal se basiese strukture, datatipes, funksies asook gestruktureerde probleemoplossing wat insluit: ontfouting, toetsing en uitvoering van toepassings.</i> • <i>Die student sal kan bewys lewer dat hy/sy die kennis en insig wat verwerf is, kan toepas ten opsigte van eenvoudige probleemoplossing met programmering, 'n algoritme kan ontwikkel om die probleem op te los, die algoritme kan implementeer (kodeer), ontfout, toets en uitvoer met behulp van die rekenaar.</i> 		
Module code: CMPG121 (=ITRW124/CISM121)	Semester 2	NQF Level: 5
Title / Titel: Structured Programming / Gestruktureerde programmering		
<p>Module outcomes / <i>Module uitkomst</i>: After the successful completion of this module, the student should demonstrate:</p> <p>Knowledge scope: basic / fundamental / elementary knowledge / informed understanding</p> <ul style="list-style-type: none"> • Fundamental knowledge of the main areas of structured programming including the basic structure, data types and functions. • Knowledge of more advanced structured programming aspects such as arrays, records, file input and output, sorting and recursion. <p>Methods and procedures: identify, select, organise and implement standard methods / procedures / rules / formulas</p> <ul style="list-style-type: none"> • The ability to use structured programming constructs in designing, coding, debugging, testing and execution of applications in a procedural programming language • The ability to understand basic representation of data in computer memory. <p>Practical skill: demonstrate / implement / apply a basic practical skill</p> <ul style="list-style-type: none"> • The ability to apply knowledge of programming constructs to develop algorithms to solve programming problems. <p>Basic problem solving skill</p>		

- The ability to apply the acquired knowledge and insight to solve elementary problems by developing algorithms, code the algorithms in a procedural language, and debug and test it on the computer.

Identify ethical and professional behaviour

- The ability to identify social and ethical issues in the field of programming.

Na afloop van die suksesvolle voltooiing van hierdie module, behoort die student die volgende te kan demonstreer.

Kennisbasis: basies / fundamenteel / elementêre kennis / ingeligte begrip

- *Fundamentele kennis van die hoofareas van gestruktureerde programmering insluitend die basiese struktuur, datatipes en funksies.*
- *Kennis van meer gevorderde gestruktureerde programmeringsaspekte soos skikkings, rekords, lêertoevoer en -afvoer, sortering en rekursie.*

Metodes en prosedures: identifiseer, selekteer, organiseer en implementeer standaard metodes / prosedures / reëls / formules

- *Die vermoë om gestruktureerde programmeringskonstrukte te gebruik tydens die ontwerp, kodering, ontfouting, toetsing en uitvoering van toepassings in 'n prosedurele programmeringstaal.*
- *Die vermoë om basiese voorstelling van data in die geheue van die rekenaar te verstaan.*

Praktiese vaardigheid: demonstreer / implementeer / pas 'n basiese praktiese vaardigheid toe

- *Die vermoë om kennis van programmeringskonstrukte toe te pas om algoritmes te ontwikkel om programmeringsprobleme op te los.*

Basiese probleemoplossings vaardighede

- *Die vermoë om toepaslike kennis en insig te gebruik om elementêre probleme op te los deur algoritmes te ontwikkel, die algoritmes te kodeer in 'n prosedurele taal, dit te ontfout en op 'n rekenaar te toets.*

Identifiseer etiese en professionele gedrag

- *Die vermoë om sosiale en etiese kwessies in die veld van programmering te identifiseer.*

Module code: CMPG122 (= ITRW123)

Semester 2

**NQF Level:
5**

Title / Titel: User interface Programming I / Gebruikerskoppelvlak-programmering

Module outcomes / *Module uitkomst:*

On completion of this module, the student should be able to:

- write a computer program that demonstrates that the student mastered a thorough knowledge of, and skill in the underlying principles, methods and the application of computer programming;
- identify problems, analyse and evaluate them and propose solutions through the design and development of applications with the emphasis on user-friendly interfaces;
- demonstrate aspects such as graphical interface design using principles of human-computer interaction, event-driven programming and incorporating databases in the graphical interface;
- demonstrate sufficient fundamental knowledge of and insight into the graphic interface environment to develop computerised systems in a visual object-based computer language;
- demonstrate the ability to implement repetitive, conditional and sequential structures.

Na suksesvolle voltooiing van hierdie module behoort die student in staat te wees om:

- 'n rekenaarprogram te skryf wat demonstreeer dat die student deeglike kennis en vaardigheid het van onderliggende beginsels, metodes en die toepassing van rekenaarprogrammering;
- probleme te identifiseer, ontleed en te evalueer en oplossings voor te stel deur die ontwerp en ontwikkeling van toepassings met die klem op gebruikersvriendelike koppelvlakke;
- aspekte soos grafiese koppelvlakontwerp met inagneming van beginsels vir mens-rekenaar-interaksie te demonstreeer, asook gebeurlikheidsgedrewe programmering en die insluiting van databasisse in grafiese koppelvlakke;
- genoegsame fundamentele kennis van en insig in die grafiese koppelvlakomgewing te demonstreeer om gerekenariseerde stelsels te ontwikkel in 'n visuele objek-gebaseerde rekenaartaal;
- die vermoë te demonstreeer om herhalende, voorwaardelike en sekvensiële strukture te implementeer.

Module code: (ITRW212)	CMPG211	Semester 1	NQF Level: 6
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Title / Titel: Object oriented programming / Objek-georiënteerde programmering

Module outcomes / *Module uitkomst:*

On completion of this module, the student should be able to demonstrate a thorough knowledge of, and skill in the underlying principles, methods and the application of the following topics:

- analyse and solve a problem and write a structured object oriented program for the solution;
- understand and apply search, sort and recursion methods in object oriented programming solutions;
- discuss, use and do calculations in different numbering systems such as the binary numbering system;
- solve problems that need file and exception handling in object oriented programming
- apply advanced object oriented concepts including inheritance and polymorphism in program solutions;
- be able to create an event driven programming (such as GUI) solution using object oriented programming;
- apply version control in project development;
- understand logical architecture which includes Karnaugh maps / gates;
- basic understanding of UML diagrams as design tools.

Na voltooiing van hierdie module moet die student in staat wees om deeglike kennis van, en vaardigheid in die onderliggende beginsels, metodes en toepassings van die volgende onderwerpe te demonstreeer:

- ontleed en los 'n probleem op en skryf 'n gestruktureerde objek-georiënteerde program vir die oplossing;
- verstaan en pas metodes van soek, sortering en rekursie in objek-georiënteerde programmeringsoplossings toe;
- verduidelik, gebruik en berekenings kan doen in getalgestelsels soos die binêre getalgestelsel;
- los probleme of wat lêer- en uitsonderingshantering in objek-georiënteerde programmering vereis;
- pas gevorderde objek-georiënteerde konsepte toe, insluitend oorerwing en polimorfisme in program-oplossings;

- *in staat wees om gebeurlikheidsgedrewe programmeringsoplossings (soos 'n GGK) deur middel van objek-georiënteerde benaderings te skep;*
- *weergawebeheer in projek-ontwikkeling te kan toepas;*
- *verstaan logiese argitektuur wat Karnaugh-diagramme en hekke insluit;*
- *'n basiese begrip te hê van UML-diagramme en ontwerphulpmiddels.*

Module code: CMPG212 (ITRW211)	Semester 1	NQF Level: 6
Title / Titel: Apps and advanced user interface programming / Toepassings en gevorderde gebruikerskoppelvlakprogrammering		
<p><i>Module outcomes / Module uitkomst:</i> On completion of this module, the student should be able to:</p> <ul style="list-style-type: none"> demonstrate a thorough knowledge of, and skill in the underlying principles, methods and the application of the following topics: advanced graphical interface programming, file handling, web-based applications and mobile applications; effectively apply programming skills with a view to develop web and mobile applications, determine the nature and scope of graphical user interface systems and select the best possible solution to solve interactive system problems; design systems that are industry-directed and user-friendly and comply with professional and ethical codes of behaviour; identify problems, analyse and evaluate them critically and propose solutions through the design and development of applications with the emphasis on user-friendly interfaces; and demonstrate the ability to communicate/demonstrate solutions/programs coherently and reliably, in a group or individually through making use of appropriate academic/professional oral and written argumentation (which includes source code commenting). <p><i>Na afloop van die suksesvolle voltooiing van hierdie module, moet die student in staat wees om:</i></p> <ul style="list-style-type: none"> deeglike kennis van, en vaardigheid van onderliggende beginsels, metodes en die toepassing van die volgende onderwerpe te demonstree: <i>Gevorderde grafiese koppelvlak programmering, lêerhantering, web-gebaseerde toepassings en mobiele toepassings;</i> programmeringsvaardighede effektief toe te pas met die oog op die ontwikkeling van web- en mobiele toepassings, die aard en omvang van grafiese gebruikerskoppelvlak stelsels te bepaal en die beste oplossing vir interaktiewe stelselprobleme te selekteer; stelsels te ontwerp wat industrie-gerig en gebruikersvriendelik is en voldoen aan professionele etiese gedragskodes; probleme te identifiseer, analiseer en krities te evalueer en oplossings voor te stel vir die ontwerp en ontwikkeling van toepassing met die klem op gebruikersvriendelike koppelvlakke; en die vermoë te demonstree om oplossings/programme in 'n groep, of individueel, koherent en betroubaar te kommunikeer/demonstree, deur gebruik te maak van toepaslike akademiese/professionele mondelinge of geskrewe argumentering (wat bronkode dokumentering insluit). 		
Module code: CMPG213 (ITRW213)	Semester 1	NQF Level: 6
Title / Titel: Systems Analysis I / Stelselontleding I		
<p><i>Module outcomes / Module uitkomst:</i> On completion of this module, the student should be able to:</p> <ul style="list-style-type: none"> describe the phases of the system development life cycle and apply the tools and techniques used during the System Initiation, Analysis and Design phases to an IT project in a chosen scenario; 		

- Describe the activities involved in project management and apply these in group context cross the stated life-cycle activities while running the IT project;
- Present project reports orally on an ongoing basis and compile documents as an ongoing activity to record facts and specifications for the involved system.
- Act responsibly and professionally when designing and presenting IT projects and when working as part of a project group.

Na afloop van die suksesvolle voltooiing van hierdie module, moet die student in staat wees om:

- die fases van die stelselontwikkelingslebenssiklus te beskryf en die hulpmiddels en tegnieke tydens inisiasie-, ontleding- en ontwerpfasies van 'n IT projek in 'n gekose omgewing toe te pas;
- die aktiwiteite betrokke by projekbestuur te bespreek en in groepsverband toe te pas tydens die verloop van die genoemde lewenssiklusfase aktiwiteite van die IT projek;
- deurlopende mondelinge voordragte te gee van projekverslae en om dokumente by te werk as deurlopende aktiwiteit om feite en spesifikasies van die betrokke stelsel te weer te gee;
- verantwoordelik en professioneel op te tree wanneer IT projekte ontwerp en voorgedra word en wanneer hy/sy deel is van 'n groep.

Module code: ITRW214 (only 2019 – for repeat registrations) (2020 CMPG312)

Semester 1

NQF Level: 6

Title / Titel: Decision support systems I / Besluitsteunstelsels I

At the end of this module the student ought to have acquired basic knowledge and insight into:

- decision-making, construction of decision-making systems,
- formulating simple linear models (break-even analysis, linear programming) and
- their solution with the aid of spreadsheets;
- carrying out sensitivity analysis and
- solving specific problems (transportation and assignment problems and networks).
- The above techniques will be used in modelling and solving simple operational problems.

Nadat die studente hierdie module suksesvol afgehandel het, behoort hulle in staat te wees om:

- 'n grondige kennis en begrip te demonstreer van 'n besluitsteunstelsel en die waarde daarvan vir 'n onderneming te kan bespreek;
- LP probleme te kan formuleer;
- LP probleme te kan oplos (grafies sowel as met die simplekxmetode);
- Sensitiwiteitsanalise van LP probleme te kan doen;
- Transportasie- en toekenningsprobleme asook heeltallige programmeringsprobleme te kan oplos terwyl netwerkmodelle en netwerktoepassings gebruik word.

Module code: CMPG214

Semester 1

NQF Level: 6

Title / Titel: Communication Skills / Kommunikasievaardighede

Module outcome / Module uitkomst:

After the successful completion of this module, the student must be able to demonstrate:

Scope of knowledge: integrated knowledge and coherent understanding

- integrated knowledge and clear / coherent / logical / critical understanding of, as well as an ability to correctly evaluate and apply the concept of a principle-based value

system according to which he / she can set personal objectives to different areas of specialisation within the field of Computer Science and Information Systems;

- integrated knowledge and clear / coherent / logical / critical understanding of, as well as an ability to correctly evaluate and apply the concept of the basic communication skills of writing and presentation techniques to different areas of specialisation within the field of Computer Science and Information Systems;
- integrated knowledge and clear / coherent / logical / critical understanding of, as well as an ability to correctly evaluate and apply the concept of soft skills such as client management, conflict management, critical thinking, decision-making, emotional intelligence, flexibility, interpersonal relations, leadership, negotiation, professionalism, self-management, teamwork, willingness to learn, and work ethic to different areas of specialisation within the field of Computer Science and Information Systems;

Practical skill: demonstrate practical skill

- ability to effectively implement communication skills;
- ability to function effectively in groups;
- ability to express themselves on the importance of soft skills, and to apply soft skills in everyday life.

Act in accordance with ethical and professional behavioural requirements

- the ability to reflect on the values, ethical conduct and justifiability of decisions.

Na afloop van die suksesvolle voltooiing van hierdie module, moet die student kan:

Omvang van kennis: geïntegreerde kennis en kritiese verstaan

- *geïntegreerde kennis en duidelike / logiese / kritiese verstaan van die konsep van 'n beginselgebaseerde waardestelsel waarvolgens persoonlike doelwitte gestel word, sowel as die vermoë om dit te evalueer en toe te pas tot verskillende areas in die veld van Rekenaarwetenskap en Inligtingstelsels.*
- *geïntegreerde kennis en duidelike / logiese / kritiese verstaan van die konsep van basiese kommunikasievaardighede en voorleggingstegnieke, sowel as die vermoë om dit te evalueer en toe te pas tot verskillende areas in die veld van Rekenaarwetenskap en Inligtingstelsels.*
- *geïntegreerde kennis en duidelike / logiese / kritiese verstaan van die konsep van sagte vaardighede soos byvoorbeeld kliëntbestuur, konflikbestuur, besluitneming, emosionele intelligensie, aanpasbaarheid, interpersoonlike verhoudinge, leierskap, onderhandelinge, professionalisme, selfbestuur, spanwerk, bereidheid om te leer, en werksetiek, sowel as die vermoë om dit te evalueer en toe te pas tot verskillende areas in die veld van Rekenaarwetenskap en Inligtingstelsels.*

Praktiese vaardigheid: demonstreeer praktiese vaardigheid

- *vaardigheid om kommunikasievaardighede effektief te implementeer;*
- *vaardigheid om effektief te werk as lid van 'n groep;*
- *vaardigheid om hulself uit te druk oor die belang van sagte vaardighede, en om sagte vaardighede toe te pas in die daaglikse lewe.*

Tree op in ooreenstemming met etiese en professionele gedragsvereistes

- *die vaardigheid om te reflekteer oor waardes, etiese gedrag en die regverdiging van besluite.*

Module code: CMPG215

Semester 1

NQF Level: 6

Title / Titel: Information Security / Inligtingsekuriteit

Module outcomes / *Module uitkomst:*

After the successful completion of this module, the student must be able to demonstrate:

- Knowledge:

On theoretical level the student should have insight and basic knowledge of main concepts of information and cyber security. These include concepts such as confidentiality, integrity, availability, authentication, privacy, secure software development, backup and recovery, legal and ethical issues. The student is introduced to security threats in the world we live in and should be able to recognise appropriate controls to counteract these threats.

- Methods and procedures:

The students should have the ability to identify and have knowledge about security threats and vulnerabilities in a computerised environment such as hardware errors, software failures, human errors, malicious intent and natural causes.

The students should demonstrate that they have knowledge and can identify applicable controls and countermeasures on different levels such as technical controls, physical controls, and procedural controls as well as social controls in order to counteract the security threats and vulnerabilities in a computerised system.

- Ethics and professional practice:

The students should have the ability to act according to the code of conduct of the IT profession towards clients and to use computer resources ethically and responsibly.

Na afloop van die suksesvolle voltooiing van hierdie module, moet die student die volgende kan demonstreer:

- *Kennis:*

Op teoretiese vlak moet die student insig en basiese kennis hê van die hoofaspekte van inligting- en kubersekuriteit. Dit sluit konsepte in soos: vertroulikheid, integriteit, beskikbaarheid, identifisering, privaatheid, veilige programmatuurontwikkeling, rugsteun en herstel, regs- en etiese kwessies. Die student word bewus gemaak van sekuriteitsbedreigings in die wêreld waarin ons leef en moet bewus wees van geskikte kontroles en teenmaatreëls om hierdie bedreigings af te weer.

- *Metodes en prosedures:*

Die student moet oor die vermoë beskik om sekuriteitsbedreigings en kwesbaarhede in 'n gerekenariseerde omgewing te kan identifiseer en kennis te dra van apparatuurfoute, programmatuurfalings, menslike foute, kwaadwillige intensies en natuurlike oorsake.

Die studente moet demonstreer dat hulle kennis het en toepaslike kontroles en teenmaatreëls kan identifiseer op verskillende vlakke, soos tegniese kontroles, fisiese kontroles, prosedurale kontroles sowel as kontroles op sosiale vlak, om sodoende sekuriteitsbedreigings en – kwesbaarhede in 'n gerekenariseerde stelsel teen te staan.

- *Etiese en professionele optrede:*

Die studente moet oor die vermoë beskik om volgens die gedragskode van die IT profesie op te tree teenoor kliënte en om rekenaarbronne eties en verantwoordelik te gebruik.

Module code: CMPG216

Semester 1

NQF Level: 6

Title / Titel: Data visualisation / Data visualisering

Module outcomes / *Module uitkomst:*

After the successful completion of this module, the student must be able to:

- Understand the importance of context and audience when presenting business data and information;
- apply knowledge of concepts of design in data visualization;
- demonstrate the ability the leverage the power of storytelling when presenting information;
- demonstrate the ability to utilise modern business intelligence tools to create effective business information reports and visualisations.

Na afloop van die suksesvolle voltooiing van hierdie module, moet die student:

- *die belangrikheid van die konteks en gehoor verstaan wanneer besigheidsdata en inligting voorgestel word;*
- *kennis van konsepte rakende die ontwerp-aspekte van data visualisering kan toepas;*

<ul style="list-style-type: none"> • die vermoë te demonstreeer om die krag van storievertellings in die voorstelling van data te benut. • die vermoë te demonstreeer om moderne hulpmiddels vir besigheidsintelligensie te gebruik om effektiewe besigheidsinligtingsverslae en visualiserings te skep. 		
Module code: CMPG221 (was ITRW222)	Semester 2	NQF Level: 6
Title / Titel: Data Structures and Algorithms / Datastrukture en Algoritmes		
<p>Module outcomes / <i>Module uitkomst:</i></p> <p>After the successful completion of this module, the student must be able to demonstrate:</p> <ul style="list-style-type: none"> • integrated knowledge and critical understanding of, as well as an ability to correctly evaluate running times and complexity of algorithms, • integrated knowledge and clear understanding of, as well as an ability to correctly evaluate and apply manipulation algorithms for data structures such as linked lists, multidimensional arrays, queues, stacks and trees, • advanced ability to effectively apply data manipulation algorithms with a view to solve familiar and unfamiliar problems including sorting and searching algorithms, using object-oriented programming techniques; • basic knowledge of design patterns and its application. <p><i>Na afloop van die suksesvolle voltooiing van hierdie module, moet die student kan:</i></p> <ul style="list-style-type: none"> • integreer kennis en kritiese begrip, tesame met die vermoë om die loopyd en kompleksiteit van algoritmes te bepaal, • integreer kennis en 'n duidelike begrip tesame met die vermoë om algoritmes vir die manipulasie van datastrukture soos geskakelde lyste, multidimensionele vektore, toue, stapels en bome te evalueer en te implementeer. • gevorderde vermoë om data manipulasie algoritmes effektief toe te pas om bekende en onbekende probleme soos sorterings- en soek-algoritmes met behulp van objek-georiënteerde metodes op te los. • basiese kennis van ontwerppatrone en hulle toepassings kan demonstreeer. 		
Module code: CMPG222	Semester 2	NQF Level: 6
Title / Titel: Data Analytics / Data analise		
<p>Module outcomes / <i>Module uitkomst:</i></p> <p>After the successful completion of this module, the student must be able to:</p> <ul style="list-style-type: none"> • understand the importance of context of large data sets. • apply knowledge of concepts of design in data analysis; • demonstrate the ability to utilise modern data analysis tools to create effective reports and visualisations. <p><i>Na afloop van die suksesvolle voltooiing van hierdie module, moet die student:</i></p> <ul style="list-style-type: none"> • die belangrikheid van die konteks van groot datastelle te verstaan. • kennis van konsepte rakende data-analise te kan toepas; • die vermoë te demonstreeer om moderne hulpmiddels te gebruik om effektiewe verslae en visualiserings te skep. 		
Module code: (ITRW225) CMPG223	Semester 2	NQF Level: 6
Title / Titel: Analysis and Design II / Stelselontleding en –ontwerp II		
<p>Module outcomes / <i>Module uitkomst:</i></p> <p>On completion of this module, the student should be able to:</p> <ul style="list-style-type: none"> • demonstrate sufficient knowledge and insight into project management techniques and apply the phases and techniques of the system development life cycle (or alternative systems development methodologies) when a system is designed and developed including the later phases of physical design, construction, testing, 		

- installation and delivery of a system;
- demonstrate that he/she can correctly apply and use the phases and techniques of a project as individual or in a group, manage a practical project by applying project management techniques, think and behave in an innovative and creative way when a computerized system is designed and developed;
- successfully write reports of projects and present it orally;
- apply a professional attitude towards clients and use computer resources ethically and responsibly when they create, complete and deliver IT projects and work as part of a project team.

Na voltooiing van hierdie module behoort die student in staat te wees om:

- *voldoende kennis en insig demonstreer in projekbestuurstegnieke en die fases en tegnieke van die stelselontwikkelingslewensiklus (of alternatiewe stelselontwikkelingsmetodologieë) toe te pas wanneer 'n stelsel ontwerp en ontwikkel word, insluitende die latere fases van fisiese ontwerp, konstruksie, toetsing, installering en aflewering van 'n stelsel;*
- *te demonstreer dat hy / sy die fases en tegnieke van 'n projek as individu of in 'n groep korrek kan toepas en gebruik, 'n praktiese projek kan bestuur deur projekbestuurstegnieke toe te pas, op innoverende en kreatiewe wyse te dink en op te tree wanneer 'n gerekenariseerde stelsel ontwerp en ontwikkel word;*
- *verslae van projekte suksesvol te kan skryf en dit mondelings te kan aanbied;*
- *'n professionele houding teenoor kliënte te toon en rekenaarhulpbronne eties en verantwoordelik gebruik wanneer hulle IT-projekte skep, voltooi en aflewer en werk as deel van 'n projekspan.*

Module code: CMPG224

Semester 2

NQF Level: 6

Title / Titel: Software Engineering / Programmatuuringenieurswese

Module outcomes / *Module uitkomst:*

On completion of this module, the student should be able to:

The students have achieved the outcomes when they are able to:

- Describe software engineering and its process.
- Describe and appropriately apply different software development methodologies to implement quality software by:
 - Describe different software processes and how to choose between them
 - Elicit requirements from a client and specify them
 - Create and analysing design models
- Develop a basic system using a DBMS using software requirements and specifications.
- Validate a basic system using a DBMS using software requirements and specifications.
- Write software engineering documentation such as reports, and user manuals
- Develop technical skills, personal skills and social skill.
- Understand good coding practices, including documentation, contracts, regression tests and daily builds.
- Define software quality and describe various quality assurance techniques, including unit testing, functional testing, and automated analysis tools.
- Work in teams peacefully and create a project plan
- Be aware of software engineering ethics and exhibit professional behaviour.

Na afloop van die suksesvolle voltooiing van hierdie module, moet die student in staat

wees om:

- *Stelsingenieurswese en die prosesse daarvan te beskryf*
- *Verskillende metodologieë programmatuurontwikkel te beskryf en toe te pas om in hoë kwaliteit programmatuur te implementeer deur:*
 - *Beskryf verskillende programmatuurprosesse en die keuse daartussen;*
 - *Bepaal spesifiseer behoefte van 'n kliënt.*
 - *Skep en analiseer ontwerpmodelle.*
- *Ontwerp 'n stelsel met behulp van 'n DBBS en programmatuurvereistes en spesifikasies.*
- *Valideer 'n basiese stelsel met behulp van 'n DBBS en programmatuurvereistes en spesifikasies.*
- *Skryf Programmatuuringenieurswese-dokumentasie soos verslae en gebruikershandleidings.*
- *Ontwikkel tegniese vaardighede, persoonlike vaardighede en sosiale vaardighede.*
- *Verstaan goeie koderingspraktyke soos dokumentasie, kontrakte, regressie toetsing, en daaglikse weergawe skepping.*
- *Definieer programmatuurkwaliteit en verskillende kwaliteitsversekeringstegnieke, soos eenheidstoetsing, funksionele toetsing, en geoutomatiseerde analise hulpmiddels.*
- *Werk in vredeliewend in groepe en skep 'n projekplan.*
- *Wees bewus van etiek van programmatuuringenieurswese en vertoon professionele gedrag.*

Module code: ITRW313

Semester 1

NQF Level: 7

Title / Titel: Expert Systems / Deskundige stelsels

Module outcomes / *Module uitkomst:*

Upon successful completion of the module the students will be able to:

- Demonstrate fundamental knowledge of expert systems;
- Represent and apply theoretical concepts of knowledge-based systems;
- Apply the basic techniques to practical problems; and
- Create and demonstrate a practical working knowledge-based expert system that integrates with existing technology.

Na voltooiing van die module behoort die student:

- *grondige kennis te demonstreer van die belangrike kwessies in die vakgebied asook die historiese onderbou van die vakgebied;*
- *vertroud te wees met die basiese konsepte binne die veld van kennisgebaseerde stelsels;*
- *die basiese tegnieke wat in die veld gebruik word te verstaan (byvoorbeeld kennisvoorstelling en inferensie) en die vermoë te demonstreer om dit op praktiese probleme toe te pas; en*
- *eenvoudige rekenaarprogramme as deskundige stelsels te kan ontwikkel deur gebruik te maak van 'n geskikte ontwikkelingshulpmiddel of programmeertaal.*

Module code: ITRW315	Semester 1	NQF Level: 7
Title / Titel: Communication Skills / Kommunikasievaardighede		
Module outcome / Module uitkomst:		
After the successful completion of this module, the student must be able to demonstrate:		
Scope of knowledge: integrated knowledge and coherent understanding		
<ul style="list-style-type: none"> • integrated knowledge and clear / coherent / logical / critical understanding of, as well as an ability to correctly evaluate and apply the concept of a principle-based value system according to which he / she can set personal objectives to different areas of specialisation within the field of Computer Science and Information Systems; • integrated knowledge and clear / coherent / logical / critical understanding of, as well as an ability to correctly evaluate and apply the concept of the basic communication skills of writing and presentation techniques to different areas of specialisation within the field of Computer Science and Information Systems; • integrated knowledge and clear / coherent / logical / critical understanding of, as well as an ability to correctly evaluate and apply the concept of soft skills such as client management, conflict management, critical thinking, decision-making, emotional intelligence, flexibility, interpersonal relations, leadership, negotiation, professionalism, self-management, teamwork, willingness to learn, and work ethic to different areas of specialisation within the field of Computer Science and Information Systems; 		
Practical skill: demonstrate practical skill		
<ul style="list-style-type: none"> • ability to effectively implement communication skills; • ability to function effectively in groups; • ability to express themselves on the importance of soft skills, and to apply soft skills in everyday life. 		
Act in accordance with ethical and professional behavioural requirements		
<ul style="list-style-type: none"> • the ability to reflect on the values, ethical conduct and justifiability of decisions. 		
<i>Na afloop van die suksesvolle voltooiing van hierdie module, moet die student kan:</i>		
<i>Omvang van kennis: geïntegreerde kennis en kritiese verstaan</i>		
<ul style="list-style-type: none"> • <i>geïntegreerde kennis en duidelike / logiese / kritiese verstaan van die konsep van 'n beginselgebaseerde waardestelsel waarvolgens persoonlike doelwitte gestel word, sowel as die vermoë om dit te evalueer en toe te pas tot verskillende areas in die veld van Rekenaarwetenskap en Inligtingstelsels.</i> • <i>geïntegreerde kennis en duidelike / logiese / kritiese verstaan van die konsep van basiese kommunikasievaardighede en voorleggingstegnieke, sowel as die vermoë om dit te evalueer en toe te pas tot verskillende areas in die veld van Rekenaarwetenskap en Inligtingstelsels.</i> • <i>geïntegreerde kennis en duidelike / logiese / kritiese verstaan van die konsep van sagte vaardighede soos byvoorbeeld kliëntbestuur, konflikbestuur, besluitneming, emosionele intelligensie, aanpasbaarheid, interpersoonlike verhoudinge, leierskap, onderhandelinge, professionalisme, selfbestuur, spanwerk, bereidheid om te leer, en werksietiek, sowel as die vermoë om dit te evalueer en toe te pas tot verskillende areas in die veld van Rekenaarwetenskap en Inligtingstelsels.</i> 		
<i>Praktiese vaardigheid: demonstreer praktiese vaardigheid</i>		
<ul style="list-style-type: none"> • <i>vaardigheid om kommunikasievaardighede effektief te implementeer;</i> • <i>vaardigheid om effektief te werk as lid van 'n groep;</i> • <i>vaardigheid om hulself uit te druk oor die belang van sagte vaardighede, en om sagte vaardighede toe te pas in die daaglikse lewe.</i> 		
<i>Tree op in ooreenstemming met etiese en professionele gedragsvereistes</i>		

<ul style="list-style-type: none"> • <i>die vaardigheid om te reflekteer oor waardes, etiese gedrag en die regverdiging van besluite.</i> 		
Module code: ITRW316	Semester 1	NQF Level: 7
Title / Titel: Operating Systems / Bedryfstelsels		
<p>Module outcome / <i>Module uitkomst:</i> On completing this module, the student should be able to demonstrate well-rounded and systematic knowledge of and insight into the principles according to which operating systems work, as well as the ways in which they are implemented; to demonstrate the ability to install operating systems on a computer; to demonstrate the ability to use Linux instructions and utility programs in carrying out assignments.</p> <p><i>Na voltooiing van hierdie module behoort die student in staat te wees om: afgeronde en sistematiese kennis van en insig in die beginsels waarvolgens bedryfstelsels werk asook die wyses waarop dit geïmplementeer word te kan demonstreer; vermoë te demonstreer om bedryfstelsels op 'n rekenaar te installeer; vermoë te demonstreer om Linux instruksies en nutsprogramme te gebruik in die uitvoer van opdragte</i></p>		
Module code: ITRW317	Semester 1	NQF Level: 7
Title / Titel: Artificial Intelligence / Kunsmatige Intelligensie		
<p>Module outcomes / <i>Module uitkomst:</i> Upon successful completion of the module the students will be able to:</p> <ul style="list-style-type: none"> • Explain that Artificial Intelligence is a full branch of Computer Science, constructed on scientific principles; • Define Artificial Intelligence and to comment on the definition; • Describe the foundations and fields of application of the subject; • Use Propositional Logic and Predicate Logic for the portrayal of problems in Artificial Intelligence; • Set up condition spaces of problems for use by search processes; • Use various uninformed and also informed search methods and to apply these to practical problems. <p><i>Na voltooiing van hierdie module behoort die studente in staat te wees om:</i></p> <ul style="list-style-type: none"> • <i>Te verduidelik dat Kunsmatige Intelligensie 'n volwaardige onderafdeling van Rekenaarwetenskap is wat gebou is op wetenskaplike beginsels;</i> • <i>Kunsmatige Intelligensie te definieer en kommentaar te lewer op die definisie;</i> • <i>Die grondslag en toepassingsvelde van die vakgebied te kan beskryf;</i> • <i>Proposisielogika en Predikaatlogika te gebruik om probleme in Kunsmatige Intelligensie voor te stel;</i> • <i>Voorwaarderuimtes van probleme op te stel wat gebruik word deur soekprosesse;</i> • <i>Verskeie oningeligte en ook ingeligte soekmetodes te gebruik en dit toe te pas op praktiese probleme.</i> 		
Module code: ITRW321	Semester 2	NQF Level: 7
Title / Titel: Databases II / Databasisse II		
<p>Module outcomes / <i>Module uitkomst:</i> On completing this module, the student should have a well-rounded and systematic knowledge and insight into transaction management; should have the ability to apply control of simultaneous use, distributed database management systems and database administration to the administration of databases in order to solve, as an individual and as a member of a group, unfamiliar concrete and abstract computer problems in the database environment.</p> <p><i>Na voltooiing van hierdie module behoort die student afgeronde en sistematiese kennis en begrip van transaksiebestuur; beheer van gelyktydige gebruik, verspreide</i></p>		

databasisbestuurstelsels en databasisadministrasie as individu en as lid van 'n groep, te kan toepas op die administrasie van databasisse om onbekende konkrete en abstrakte rekenaarprobleme binne die databasisomgewing te kan oplos.

Module code: ITRW322

Semester 2

NQF Level: 7

Title / Titel: Computer Networks / Rekenaarnetwerke

Module outcomes / *Module uitkomst:*

On completing this module students should be able to demonstrate well-rounded and systematic knowledge and insight into the operation of examples of networks, different frames of reference for networks, as well as the network protocols that play a role at the different levels of the frames of reference; to complete, as an individual and as a member of a group, a project that has basic network capabilities.

Na voltooiing van hierdie module behoort die studente in staat te wees om afgeronde en sistematiese kennis en begrip te demonstree van die werking van voorbeeldnetwerke, van verskillende verwysingsraamwerke vir rekenaarnetwerke asook van netwerkprotokolle wat op verskillende vlakke van die verwysingsraamwerke 'n rol speel; as 'n individu sowel as 'n lid van 'n groep 'n projek te voltooi wat basiese netwerkvermoëns het.

Module code: ITRW324

Semester 2

NQF Level: 7

Title / Titel: IT Developments / IT-Ontwikkelings

Module outcomes: / *Module uitkomst:*

Students have achieved the outcomes if they are able to:

- Analyse given problems.
- Search for literature on, and possible solutions for given problems.
- Propose possible solutions and choose an appropriate solution.
- Design and implement the chosen solution using appropriate technology.
- Write a project report and present the project.
- Work as an individual and as a group.

Nadat die student die module voltooi het, behoort hy/sy:

- *die vaardigheid te demonstree om soektogte via die internet of ander bronne te kan doen om ondersteuningsmateriaal te bekom om kennis aan te vul en om probleme op te los;*
- *die vermoë te demonstree om met selfvertroue en selfstandig, nuwe tegnologie te bestudeer, te ondersoek en te bemeester om toepassings te kan implementeer;*
- *as individu en as lid van 'n groep, korrek gestruktureerde verslae te kan skryf oor die onderwerpe wat ondersoek en bestudeer is asook oor die stelsels wat ontwikkel en geïmplementeer is en dit mondeling aan eweknieë kan verduidelik en demonstree.*

Module code: ITRW325

Semester 2

NQF Level: 7

Title / Titel: Decision Support Systems II / Besluitsteunstelsels II

Module outcomes / *Module uitkomst:*

Upon successful completion of the module the students will be able to:

- Identify the problem (or model type) based on a problem specification given;
- Solve given problems in each of the (sub)fields of study by hand and/or by utilizing available software;
- Interpret/explain the solution to the problem (as for management);
- Construct/develop a DSS based on a given Case Study (Project).

Nadat die studente hierdie module suksesvol afgehandel het, behoort hulle

- *'n afgeronde en sistematiese kennis en begrip te demonstree van die argitektuur van 'n besluitsteunstelsel;*

- die vaardigheid te demonstreeer om as individu en in groepsverband verskillende tipes probleme op te los deur die keuse van 'n geskikte besluitsteunmodel en die vermoë hê om 'n besluitsteunstelsel te kan konstrueer d.m.v. die integrasie van alle voorafgaande kennis
- Ontwerp van 'n stelsel op 'n gevallestudie (projek)

NAS.2.8.17 INDIGENOUS KNOWLEDGE

Module code: IKSM111	Semester 1	NQF level:5
Title: The Nature and Patterns of Indigenous Knowledge Systems (IKS) and Innovations		
Module outcomes: At the end of the module the students will be able to demonstrate an understanding of the nature and patterns of African indigenous knowledge systems (IKS) and innovations.		
Method of delivery: Contact and practical modes of teaching: Lectures, audio visuals, excursions		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM112	Semester 1	NQF level:5
Title: African Indigenous Languages and Communication Systems		
Module outcomes: At the end of the module students will be able to analyse the impact of indigenous languages and communication systems in addressing the psycho - social and cultural needs of the African society.		
Method of delivery: Contact and practical modes of teaching: Lectures, audio visuals, community excursions.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM113	Semester 1	NQF level:5
Title: Introduction to Health Care Systems in relation to Indigenous Knowledge Systems (IKS)		
Module outcomes: At the end of the module students will be able to: define health care system; describe current trends in health care systems; explain indigenous health care modalities; identify challenges and opportunities of integrating indigenous and modern health care systems; analyse health care systems in relation to IKS.		
Method of delivery: Contact and practical modes of teaching: Lectures, audio visuals, community excursions		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM114	Semester 1	NQF level:5
Title: The Role of Indigenous Knowledge Systems in Climate Change		
Module outcomes: At the end of the module students will be able to: define climate change and explain its causes; identify the effects of climate change in various sectors and on sustainable community livelihoods; explain the role of IKS in mitigating the effects of climate change..		
Method of delivery: Contact and practical modes of teaching: Lectures, audio visuals, excursions.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM115	Semester 1	NQF level:5
Title: Introduction to African Indigenous Life Skills Education		
Module outcomes: At the end of the module students will be able to demonstrate knowledge and critical understanding of the concepts and approaches to life skills and counselling from an African indigenous socio - cultural perspective.		
Method of delivery: Contact and practical modes of teaching: Lectures, audio visuals, excursions.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		

Module code: IKSM121	Semester 2	NQF level:5
Title: A Historiography of African Indigenous Science and Technology		
Module outcomes: At the end of the module students will demonstrate an understanding of the development of African indigenous science and technology		
Method of delivery: Contact and practical modes of teaching: Lectures, audio visuals, excursions.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: : IKSM122	Semester 2	NQF level:5
Title: Introduction to Tools of Indigenous Knowledge Management		
Module outcomes: At the end of the module students will be able to generate, populate and manage IKS data using ICT tools.		
Method of delivery: Contact and practical modes of teaching: Lectures, audio visuals, excursions.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: : IKSM123	Semester 2	NQF level:5
Title: The Use and Roles of Signs and Symbols in African Communities		
Module outcomes: At the end of the module students will be able to analyze the use and roles of signs and symbols in Indigenous languages and communication systems as they link up with the needs of the different African cultures and societies		
Method of delivery: Contact and practical modes of teaching: Lectures, audio visuals, excursions.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM124	Semester 2	NQF level:5
Title: The Nature and Roles of African Indigenous Health Care Providers		
Module outcomes: After successful completion of this module the student should be able to : demonstrate an understanding of the nature, roles and the impact of health care providers in African indigenous health care systems; explain the impact of African Indigenous Health Care Providers on primary health; identify the different African Indigenous Health Care Providers; explain the theories of indigenous wellness		
Method of delivery: Contact and practical modes of teaching: Lectures, audio visuals, excursions		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM125	Semester 2	NQF level:5
Title: African Indigenous Food Security Systems		
Module outcomes: At the end of the module students will be able to: define food security; explain the nature and characteristics of African indigenous food security systems; identify the elements and components of the African Indigenous Food Security Systems; critically analyse case studies of African Indigenous Food Security Systems		
Method of delivery: Contact and practical modes of teaching: Lectures, audio visuals, excursions.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: : IKSM211	Semester 1	NQF level:6
Title: The Rights of Indigenous Peoples		
Module outcomes: At the end of the module students will be able to understand the rights and major concerns of indigenous peoples and the national, regional and international legal mechanisms to address them.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		

Module code: IKSM212	Semester 1	NQF level:6
Title: African Cultural Astronomy		
Module outcomes: At the end of the module students will be able to understand the rights and major concerns of indigenous peoples and the national, regional and international legal mechanisms to address them.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: : IKSM213	Semester 1	NQF level:6
Title: The Nature and Characteristics of African Indigenous Health Care Systems		
Module outcomes: At the end of the module students will be able to: explain the nature and characteristics of African indigenous health care systems; describe the theories behind African indigenous health care systems; identify the challenges and prospects of African indigenous health care systems		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM214	Semester 1	NQF level:6
Title: African Indigenous Knowledge Development and Management		
Module outcomes: At the end of the module student will be able to demonstrate an understanding of the nature and characteristics of African indigenous knowledge development and management systems.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM215	Semester 1	NQF level:6
Title: Implications of Intellectual Property Rights (IPR) on Indigenous Knowledge Systems (IKS) / Traditional Knowledge (TK)		
Module outcomes: At the end of the module students will able to demonstrate an understanding of the nature, characteristics, importance and implications of IPR for IKS / Traditional Knowledge (TK).		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM221	Semester 2	NQF level:6
Title: African Indigenous Architecture and Design		
Module outcomes: At the end of the module students will be able to critically interrogate theories and principles on African architectural designs and its contribution to contemporary designs and housing needs.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: WVCS221	Semester 2	NQF level:6
Title: Understanding the Cultural World		
Module outcomes:		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM222	Semester 2	NQF level:6
Title: African Indigenous Approaches to Peace and Conflict Resolution		
Module outcomes: At the end of the module students will demonstrate an understanding of the efficacy of African indigenous approaches and institutions for conflict transformation and peace - building for sustainable community livelihood.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		

Module code: IKSM223	Semester 2	NQF level:6
Title: Socio - Cultural Protocols associated with African Traditional Medicine and Health Care Systems		
Module outcomes: : After successful completion of this module the student should be able to: demonstrate an understanding of the socio - cultural protocols in African traditional medicine and health care systems. Explain the international and national legal instruments supporting bio-cultural community protocols		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM224	Semester 2	NQF level:6
Title: African Indigenous Cultural, Bio - Diversity and Heritage		
Module outcomes: At the end of the module students will be able to: Define African Indigenous Cultural, Bio - Diversity and Heritage; explain the concepts and theories associated with African indigenous cultural, bio - diversity and heritage; Apply concepts and theories associated with African indigenous cultural, bio - diversity and heritage to climate change and globalization issues; explain the significance of . African indigenous cultural, bio - diversity and heritage for sustainable community livelihood and development with examples.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM225	Semester 2	NQF level:6
Title: Foundations of African Indigenous Education		
Module outcomes: At the end of the module students will demonstrate an understanding of the nature, structure and content of African indigenous education; the impact of colonialism and other forms of imperialism on pre - colonial education and the interfacing of African indigenous and modern forms of education.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSS311	Semester 1	NQF level:7
Title: Introduction to African Ethno - mathematics		
Module outcomes: At the end of the module students will demonstrate knowledge and understanding of the African Ethno - mathematics		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSS312	Semester 1	NQF level:7
Title: Comparative African Indigenous and Western Science and Technology Systems		
Module outcomes: At the end of the module students will demonstrate a critical and comparative analysis of the development of African indigenous and western science and technology.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM313	Semester 1	NQF level:7
Title: Theories of Indigenous Community Innovation Systems and Technologies for Sustainable Livelihood		
Module outcomes: At the end of the module students will be able to:		
Demonstrate detailed knowledge of the theories, concepts and applications associated with community innovation and technologies.		
Compare and contrast between African community innovation and technologies for sustainable livelihood.		

Make a critical evaluation of the role African community innovation and technologies on sustainable livelihood.		
Make an analysis of African community innovation and technologies on sustainable livelihood.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSS321	Semester 2	NQF level:7
Title: African Indigenous Metallurgy 1		
Module outcomes: At the end of the module students will be able to analyse and apply the scientific and technological processes involved in African indigenous metallurgy for sustainable community livelihood.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSS322	Semester 2	NQF level:7
Title: African Indigenous Ethno mathematics 11		
Module outcomes: At the end of the module students will demonstrate critical knowledge and skills of African indigenous Ethno mathematics		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSS323	Semester 2	NQF level:7
Title: Comparative African Indigenous Textile Technologies		
Module outcomes: At the end of the module students will acquire critical knowledge and skills of the scientific and technological processes involved in African indigenous textile technologies		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSS324	Semester 2	NQF level:7
Title: Indigenous Knowledge and Renewable Energy Sources for Sustainable Livelihood		
Module outcomes: : At the end of the module student will demonstrate a critical knowledge and understanding of the relationship between indigenous knowledge systems (IKS), community - based renewable energy sources and sustainable development and livelihood in African local communities.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSA311	Semester 1	NQF level:7
Title: Impact of Climate Change on African Indigenous Food Security Systems		
Module outcomes: At the end of the module student will be able to:		
Demonstrate knowledge and understanding of the theories and applications on the causes (natural and human) of climate change within the context of indigenous agriculture.		
Demonstrate an understanding of the effects of climate change on sustainable indigenous community livelihoods.		
Make a critical evaluation of the impact of climate change on African indigenous food security systems.		
Make an evaluation the role of indigenous knowledge and systems in mitigating against the effects of climate change.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		

Module code: IKSC311	Semester 1	NQF level:7
Title: Comparative Western and African Indigenous Life Skills Education		
Module outcomes: : At the end of the module students will:		
Demonstrate detailed knowledge of the theories and application of western and African indigenous life skills education.		
Make a critical evaluation of the socio - cultural context of western and African indigenous life skills education.		
Compare and contrast western and African life skills education.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSC312	Semester 1	NQF level:7
Title: Comparative African Indigenous and Western Peace and Conflict Resolution Approaches		
Module outcomes: At the end of the module, students will be able to:		
Demonstrate detailed knowledge of indigenous and western peace and conflict resolution approaches.		
Make an application of theories of indigenous and western peace and conflict resolution approaches.		
Compare and contrast between indigenous and western peace and conflict resolution approaches.		
Display a critical knowledge of indigenous and western peace and conflict resolution approaches.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSH311	Semester 1	NQF level:7
Title: Comparative Health Care Systems		
Module outcomes: : After successful completion of this module the student should be able to:		
Demonstrate an understanding of the theories of different health care systems of the world;		
Make an application of theories of health care systems to the southern African region;		
Compare and contrast different health care systems in the world; Make an evaluation of the nature, characteristics and limitations of the different health care systems of the world.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSH312	Semester 1	NQF level:7
Title: African Indigenous Medicinal and Nutritional Significance of Living Organisms		
Module outcomes: After successful completion of this module the student should be able to:		
Demonstrate and understanding of the significance of living organisms as medicine and food;		
Make an evaluation of the extent of interdependence between human beings and other living organisms from an indigenous Knowledge Systems health care perspective; Make a critical analysis of the medicinal and nutritional significance of African indigenous living organisms.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		

Module code: IKSM313	Semester 1	NQF level:7
Title: Theories on African Indigenous Community Innovation Systems and Technologies for Sustainable Livelihood		
Module outcomes: : At the end of the module students will be able to:		
Demonstrate detailed knowledge of the theories, concepts and applications associated with community innovation and technologies.		
Compare and contrast between African community innovation and technologies for sustainable livelihood.		
Make a critical evaluation of the role African community innovation and technologies on sustainable livelihood.		
Make an analysis of African community innovation and technologies on sustainable livelihood.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSH314	Semester 1	NQF level:7
Title: Gender in African Indigenous Health Care Systems		
Module outcomes: At the end of the module students will be able to:		
Demonstrate an understanding of the role of gender in African Indigenous Health Care Systems.		
Make a critical analysis of the role of gender in African indigenous health care systems.		
Make an evaluation on the relationship between gender, culture and science and technology with regards to African Indigenous Health Care Systems.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSA321	Semester 2	NQF level:7
Title: African Indigenous Agriculture and Sustainable Community Livelihood and Development in Southern Africa		
Module outcomes: At the end of the module the students will be able to:		
Demonstrate an understanding of the role of African indigenous agriculture for sustainable community livelihoods in Southern Africa.		
Display detailed knowledge on the types and elements of African indigenous agriculture and their contribution to sustainability.		
Comprehend the role of African indigenous agriculture in community development in Southern Africa.		
Demonstrate a critical understanding of the challenges and prospects of indigenous agriculture for community livelihoods and development in the Southern African region.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSA322	Semester 2	NQF level:7
Title: Comparative African Indigenous Cultural, Bio - diversity and Heritage		
Module outcomes: At the end of the module students will be able to:		
Compare and contrast African indigenous and Western cultural, biodiversity and heritage.		

Demonstrate detailed knowledge and understanding of the concepts and theories associated with African indigenous cultural, biodiversity and heritage.		
Make a critical evaluation of African indigenous cultural, bio-diversity and heritage.		
Understand the relationships between African indigenous cultural, biodiversity and heritage.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSA323	Semester 2	NQF level:7
Title: Comparative African Indigenous and Western Food Security Systems		
Module outcomes: : At the end of the module, students will be able to:		
Compare and contrast African indigenous and western food security systems.		
Demonstrate detailed knowledge of the components of African indigenous and western food security systems and their role in sustainable community livelihoods.		
Evaluate the challenges and prospects of African indigenous and western food security systems.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSH321	Semester 2	NQF level:7
Title: The Nature and Role of African Indigenous Health Care Providers		
Module outcomes: At the end of the module students will be able to:		
Demonstrate an understanding of the categories and roles of African indigenous health care providers.		
Demonstrate detailed knowledge of the theories, challenges and prospects of African indigenous health care providers in the primary health realm.		
Make an analysis of the practices of African indigenous health care providers.		
Make an evaluation of the application of standard protocols by African indigenous health care providers.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSH322	Semester 2	NQF level:7
Title: African Indigenous Knowledge (IK) and Innovation Systems in Public Health Care 1		
Module outcomes: After successful completion of this module the student should be able to: Display detailed knowledge of the research, innovation and technologies in African public health; Demonstrate understanding of the benefits of IK innovations in public health; Make a critical analysis of the role of policy and institutions in promoting African indigenous knowledge (IK) and innovation systems in public health care; Make an evaluation of the challenges and opportunities of African Indigenous Knowledge (IK) and Innovation Systems in Public Health Care.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSH323	Semester 2	NQF level:7
Title: African Traditional Medicine and Health Care Systems 1		
Module outcomes: : Demonstrate understanding of the history of African Traditional Medicine and Health Care Systems; Compare and contrast between African Traditional and western health care systems; Make a critical analysis on the challenges experienced by African Traditional Medicine Practitioners		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		

Module code: IKSC321	Semester 2	NQF level:7
Title: African Traditional Governance and Democracy		
Module outcomes: At the end of the module, students will be able to:		
<ul style="list-style-type: none"> • Demonstrate detailed knowledge and understanding of the nature and characteristics of African traditional authority. • Make an application of the theories and practices of African traditional authorities in the promotion of democracy and socio – economic development in local communities. • Demonstrate detailed understanding of the role of African traditional authorities in the promotion of democracy and socio – economic development in local communities. 		
Compare and contrast African traditional governance and western governance.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSC322	Semester 2	NQF level:7
Title: African indigenous music and dance		
Module outcomes: At the end of the module students will be able to:		
<ul style="list-style-type: none"> • Demonstrate an in-depth understanding and knowledge of the nature, characteristics, principles and practices of different African indigenous music and dances. • Make an application of the theories and concepts of different African indigenous music and dances. 		
Compare and contrast African indigenous music and dances from different African cultures		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSC323	Semester 2	NQF level:7
Title: Gender in African indigenous arts and culture		
Module outcomes: At the end of the module, students will be able to:		
<ul style="list-style-type: none"> • Demonstrate detailed knowledge of African indigenous arts and culture. • Make an application of the theories and concepts of gender in African indigenous arts and cultural issues. 		
Understand the role of gender in African indigenous arts and cultural issues.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSH411	Semester 1	NQF level:8
Title: African Traditional Medicine and Health Care Systems II		
Module outcomes: After successful completion of this module the student should be able to: Demonstrate detailed knowledge of African traditional medical systems for sustainable community livelihood. Display detailed knowledge of theories, concepts and practices of African traditional medical systems. Make an evaluation of the role of African traditional medical systems on sustainable livelihood.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM411	Semester 1	NQF level:8
Title: Principles of Research		
Module outcomes: At the end of the module students will be able to demonstrate an understanding and skills of recording and using IKS for promoting sustainable community livelihood in local communities.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM412	Semester 1	NQF level:8
Title: Research Methodologies in Indigenous Knowledge Systems (IKS)		
Module outcomes: At the end of the module students will be able to: explain the differences between Qualitative and Quantitative Research Methods; describe the components of		

Qualitative and Quantitative Research Methods; select the appropriate research methods to use in IKS research; demonstrate skills of applying the principles of qualitative and quantitative research methods in IKS research; select and apply appropriate research method to an IKS research project		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSS413	Semester 1	NQF level:8
Title: African Indigenous Metallurgy II		
Module outcomes: At the end of the module students will be able to analyse and apply the scientific and technological processes involved in African Indigenous metallurgy for sustainable community livelihood.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: IKSM421	Semester 2	NQF level:8
Title: Internship and Research Project		
Module outcomes: At the end of the module students will be able to gain practical experience and skills in their field of IKS specialization; and will be able to write an independent research paper based on the field experience (internship) in their area of specialization.		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		
Module code: WVCS315	Semester 1	NQF level:7
Title: Man and Society		
Module outcomes: At the end of the module, student will be able to have a solid and systematic knowledge of the most important foundational issues in the field of IKS and demonstrate a critical understanding of the meta-theoretical assumptions underscoring foundational issues; demonstrate knowledge and a critical understanding of specific forms of ethics that apply to the field of IKS , such as a personalized code of conduct or the general human rights charter, and be able to apply such forms of ethics discriminately to analyse, evaluate and pose possible solutions to some current themes or issues salient to the field of IKS; demonstrate the ability to analyse, synthesize and critique the assumptions on which a chosen theme or issue are based, formulate a personal opinion about the theme or issue that gives evidence of an own coherent world view, and communicate the findings in a presentation making use of applicable technology, as well as in a proof-based report written in a typically academic format		
Method of delivery: Contact and practical modes of teaching: Lectures and audio visuals.		
Assessment modes: 1 Test (10%) 2 Assignments (20%) 1 Project (20%) 3 Hour exam (50%).		

NAS.2.8.18 MICROBIOLOGY / MIKROBIOLOGIE

Module code: MKBN121	Semester 2	NQF Level: 5
Title / Titel: Introductory Microbiology for Nursing / Mikrobiologie vir Verpleegkunde		
Module outcomes / Module uitkomst:		
After completion of the module, the student should be able to:		
<ul style="list-style-type: none"> • demonstrate knowledge of microbiology and its relation to health sciences; • apply knowledge of infectious diseases, infection control and related procedures within the health sciences context; • demonstrate and apply specific microbiology laboratory techniques; • exhibit skills in elementary research techniques, group work, report writing and problem solving through case studies; • uphold strict ethical principles in all situations and show respect for life without exception. 		

Na voltooiing van die module moet die student in staat wees om:

- Kennis van mikrobiologie en die verwantskap daarvan met gesondheidswetenskappe te kan demonstreeer.
- Kennis van infektiewe siektetoestande, beheer van infeksies en verwante prosedures binne die konteks van gesondheidsorg toe te kan pas.
- Spesifieke mikrobiologiese laboratoriumtegnieke wat relevant is tot gesondheidswetenskappe te demonstreeer en toe te pas.
- Vaardighede wat betref elementêre navorsingstegnieke, groepwerk, skryf van verslae en probleemoplossing deur middel van gevallestudies te kan toon.

Streng etiese beginsels in alle omstandighede te kan handhaaf en deurgaans respek vir lewe te kan toon.

Module code: MKBN211

Semester 1

NQF Level: 6

Title / Titel: Introductory Microbiology / Inleidende Mikrobiologie

Module outcomes / Module uitkomst:

At the end of the module the student should be able to:

- Demonstrate detailed knowledge of development, scope and contribution of Microbiology as a discipline; basic concepts in Microbiology and characteristics of different types of microorganisms.
- Demonstrate an understanding of and ability to apply and demonstrate basic practical skills in the laboratory that are associated with Microbiology.
- Identify, evaluate and solve problems in unfamiliar contexts by gathering evidence and applying solutions based on evidence and procedures appropriate to Microbiology.
- Communicate complex information reliably and coherently using appropriate academic formats relevant to the field of Microbiology.
- Demonstrate an ability to evaluate performance against given criteria and identify and address own task-specific learning needs.
- Work effectively in a group and to take responsibility for own decisions and actions as well as those of group members in a defined context, including the ethical use of resources.

Nadat hierdie module voltooi is, moet die student in staat wees om:

- Gedetailleerde kennis te demonstreeer van die ontwikkeling, omvang en bydrae van Mikrobiologie as 'n dissipline; basiese konsepte in Mikrobiologie en eienskappe van verskillende tipes mikroörganismes.
- Basiese praktiese vaardighede wat geassosieer word met Mikrobiologie te kan uitvoer en demonstreeer in die laboratorium en 'n begrip daarvan te toon.
- Probleme in onbekende kontekste te kan identifiseer, evalueer en oplos deur bewyse te versamel en oplossings toe te pas gebaseer op bewyse en prosedures wat toepaslik is in Mikrobiologie.
- Komplekse inligting betroubaar en samehangend te kan oordra deur gebruik te maak van gepaste akademiese formate wat relevant is tot die veld van Mikrobiologie.
- Die vermoë te demonstreeer om prestasie teen gegewe kriteria te evalueer en eie taak-spesifieke leerbehoefes te identifiseer en aan te spreek.
- Effektief te werk in 'n groep en om verantwoordelikheid te neem vir eie besluite en aksies sowel as die van groeplede in 'n gedefinieerde konteks, insluitend die etiese gebruik van bronne.

Module code: MKBS221	Semester 2	NQF Level: 6
Title / Titel : Introductory Microbial Genetics, Virology and Immunology / Inleidende mikrobiële genetica, virologie en immunologie		
<p>Module outcomes / <i>Module uitkomst</i>:</p> <p>At the end of the module the student should be able to:</p> <ul style="list-style-type: none"> • demonstrate knowledge and informed understanding of key concepts relevant to microbial genetics, virology and immunology; • Select and effectively apply the basic standard procedures and laboratory techniques relevant to the field of molecular biology and genetics. • Identify, analyse and solve problems in the field of microbial genetics, virology and immunology in unfamiliar contexts. • Communicate complex information reliably and coherently using appropriate academic formats relevant to the field of Microbiology. • Demonstrate an ability to evaluate performance against given criteria and identify and address own task-specific learning needs. • Work effectively in a group and to take responsibility for own decisions and actions as well as those of group members in a defined context, including the ethical use of resources. <p><i>Aan die einde van die module moet die student in staat wees om:</i></p> <ul style="list-style-type: none"> • Kennis en duidelike begrip te toon van die sleutelkonsepte relevant tot mikrobiële genetica, virologie en immunologie; • Die basiese standaardprosedures en laboratoriumtegnieke wat relevant is tot die veld van molekulêre biologie en genetica kan selekteer en effektief toepas; • Probleme in die veld van mikrobiële genetica, virologie en immunologie in onbekende kontekste te identifiseer, analiseer en oplos; • Komplekse inligting betroubaar en sinvol te kan kommunikeer deur gebruik te maak van gepaste akademiese formaat in die veld van Mikrobiologie; • Die vermoë te demonstreer om eie vordering en prestasie te kan meet teen gegewe kriteria en om self taak-spesifieke leerbehoefes aan te spreek; • Effektief te kan werk in 'n groep en verantwoordelikheid neem vir eie besluite en aksies sowel as die van groeplede in 'n gedefiniëerde konteks, insluitend die etiese gebruik van bronne. 		
Module code: MKBS313	Semester 1	NQF Level: 7
Title / Titel: Microbial Physiology / Mikrobiële Fisiologie		
<p>Module outcomes / <i>Module uitkomst</i>:</p> <p>At the end of the module the student should be able to:</p> <ul style="list-style-type: none"> • Demonstrate an integrated knowledge and clear understanding of the diversity of microbial physiology (metabolism) and the impacts and applications thereof. • Be able to implement appropriate methods and procedures to apply principles from microbial physiology (metabolism) to characterise, identify and study microorganisms. • Demonstrate an advanced ability to effectively identify and analyse complex problems, use practical skills mastered in the module and apply principles of microbial physiology (metabolism) to support evidence-based solutions and theory-driven arguments. 4. Obtain, manage and process information gathered from literature or through experimentation. This includes being able to independently validate the reliability of information or data. Students should also be able to communicate information and research findings in well-formulated arguments in written and oral reports. 		

- Interpret and manage tasks related to microbial physiology (metabolism). This include monitoring the progress of teams and taking responsibility for task outcomes.
- Effectively identify, evaluate and address his/her learning needs in a self-directed manner, and to facilitate collaborative learning processes.
- Demonstrate the ability to take full responsibility for his or her work, including acting professionally and ethically when working with microorganisms, always maintaining an awareness of public and/or environmental safety.

Aan die einde van die module moet die student in staat wees om:

- *'n Geïntegreerde kennis en duidelike begrip van die diversiteit van mikrobiële fisiologie (metabolisme) asook die impakte en toepassings daarvan kan demonstreeer.*
- *In staat wees om gepaste metodes en prosedures te implementeer om beginsels vanuit mikrobiële fisiologie (metabolisme) toe te pas om mikroörganismes te karakteriseer, identifiseer en bestudeer.*
- *Gevorderde vaardighede te demonstreeer om effektief komplekse probleme te identifiseer en te analiseer; deur praktiese vaardighede wat bemeester is in hierdie module en toepassing van die beginsels van mikrobiële fisiologie (metabolisme), bewys-gebaseerde en teorie-gedrewe argumente te ondersteun.*
- *Inligting te verkry, hanteer en te verwerk vanaf literatuur of eksperimentele werk. Dit sluit in die vermoë om die inligting en bevindinge te kan kommunikeer as goed geformuleerde stelling in geskrewe of mondelinge verslae.*
- *Take met betrekking tot mikrobiële fisiologie (metabolisme) te kan interpreteer en te bestuur. Dit sluit in die monitering van die vordering van groepe en om verantwoordelike te neem vir die taak se uitkomstes.*
- *Effektief sy/haar leerbehoefes kan identifiseer, evalueer en aanspreek op 'n self-gedrewe wyse om gesamentlike leerprosesse te fasiliteer.*
- *Die vermoë demonstreeer om volle verantwoordelike te neem vir sy of haar werk, insluitend professionele en etiese gedrag wanneer daar met mikroörganismes gewerk word, terselfdertyd ook bewustheid handhaaf vir publieke- en/of omgewingsveiligheid.*

Module code: MKBS314

Semester 1

NQF Level: 7

Title / Titel: Recombinant DNA Technology and Industrial Microbiology / Rekombinante DNA tegnologie en Industriële Mikrobiologie

Module outcomes / Module uitkomstes:

At the end of the module the student should be able to:

- Demonstrate an integrated knowledge and clear understanding of recombinant DNA technology and industrial microbiology as well as the impacts and applications thereof in society.
- Be able to implement appropriate methods and procedures to (i) apply principles from recombinant DNA technology and industrial microbiology to identify, characterise and study microorganisms used in laboratory and industrial settings; (ii) use methods and national standards to critically describe and evaluate the application of microbiology in water and waste-water treatment processes.
- Demonstrate an advanced ability to effectively identify and analyse complex problems, use practical skills mastered in the module and apply principles of recombinant DNA technology and industrial microbiology to support evidence-based solutions and theory-driven arguments.
- Demonstrate the ability to obtain, manage and process information gathered from literature or through experimentation. This includes being able to independently validate the reliability of information or data. Students should also be able to communicate

information and research findings in well-formulated arguments in written and oral reports.

- Interpret and manage tasks related to recombinant DNA technology and industrial microbiology in unfamiliar environments. This includes monitoring the progress of teams and taking responsibility for task outcomes.
- Effectively identify, evaluate and address his/her learning needs in a self-directed manner, and to facilitate collaborative learning processes.
- Demonstrate the ability to take full responsibility for his or her work, including acting professionally and ethically when working with microorganisms, always maintaining an awareness of public and/or environmental safety.

Aan die einde van die module moet die student in staat wees om:

- *'n Geïntegreerde kennis en duidelike begrip van rekombinante DNA tegnologie en industriële mikrobiologie te kan demonstreer asook die impakte en toepassings daarvan in die samelewing.*
- *In staat wees om gepaste metodes en prosedures te implementeer om (i) beginsels vanuit rekombinante DNA tegnologie en industriële mikrobiologie toe te kan pas om mikroörganismes te karakteriseer, identifiseer en bestudeer in die laboratorium en industriële omgewings; (ii) metodes en nasionale standaarde te gebruik om krities die toepassing van mikrobiologie in water en afvalwater prosesse te evalueer.*
- *'n Gevorderde vaardigheid demonstreer om effektief komplekse probleme te identifiseer en te analiseer en dan deur praktiese vaardighede bemeester in hierdie module en deur die beginsels van rekombinante DNA tegnologie en industriële mikrobiologie toe te pas, bewys-gebaseerde en teorie-gedrewe argumente te ondersteun.*
- *Die vermoë demonstreer om inligting te verkry, hanteer en te verwerk vanaf literatuur of eksperimentele werk. Dit sluit in die vermoë om die betroubaarheid van die inligting of data te kan beoordeel. Studente moet ook in staat wees om navorsingsbevindinge te kan kommunikeer as goed geformuleerde stellings in geskrewe of mondelinge verslae.*
- *Take met betrekking tot rekombinante DNA tegnologie en industriële mikrobiologie te kan interpreteer en te kan bestuur. Dit sluit in die monitering van die vordering van groepe en om verantwoordelikheid te neem vir die taak se uitkomstes.*
- *Effektief sy/haar leerbehoefes kan identifiseer, evalueer en aanspreek op 'n self-gedrewe wyse om gesamentlike leerprosesse te fasiliteer.*
- *Die vermoë demonsteer om volle verantwoordelikheid te neem vir sy of haar werk, insluitend professionele en etiese gedrag wanneer daar met mikroörganismes gewerk word, terselfdertyd ook bewustheid handhaaf vir publieke- en/of omgewingsveiligheid.*

Module code: MKBS316

Semester 1

NQF Level: 7

Title: Microbial Ecology

Module outcomes

At the end of the module the student should demonstrate:

- an understanding of the key concepts and theories of microbial ecology;
- an understanding of the physiological, morphological and genetic adaptation of microbes to their environments;
- an understanding of microbial interaction that involves inter-and the intra relationship between various microorganisms;
- an ability to outline and communicate the different biogeochemical cycles (nutrient cycles) and the role of microbes in these cycles;
- an understanding of the life of micro-organisms in air, marine, freshwater and terrestrial environments;

- an ability to apply, in a self-critical manner outline methods to measure microbial activity in nature.

Module code: MKBS317	Semester 1	NQF Level: 7
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Title: Environmental Microbiology and Public Health

- At the end of the module the student should demonstrate:
- an understanding of the main impacts of environmental microbes and processes to public health.
 - an understanding of the major products of Industrial pollution both in water and air.
 - an understanding of the major microorganisms responsible for biodeterioration, biodegradation and bioremediation.
 - an understanding of wastewater treatment, purification and sanitary analysis as well as the health impact of improperly treated water.
 - an understanding of waterborne and airborne diseases and their epidemiological implications.

Module code: MKBS325	Semester 2	NQF Level: 7
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Title / Titel: Diversity and Ecology of Microorganisms / Diversiteit en Ekologie van Mikroörganismes

Module outcomes / *Module uitkomst:*

- At the end of the module the student should be able to:
- Demonstrate an integrated knowledge and clear understanding of diversity in the microbial kingdom and explain how this relates to humans and the environment.
 - Implement standard methods and procedures to evaluate microbial diversity and to study microbial ecology; use practical skills mastered in the module to determine microbial diversity using taxonomic procedures and to study the effect of the environment on microorganisms.
 - Effectively identify and analyse complex problems and apply evidence-based solutions and theory-driven arguments.
 - Demonstrate the ability to obtain, manage and process information gathered from literature or through experimentation. This includes being able to independently validate the reliability of information or data.
 - Be able to interpret and manage tasks related to microbial diversity and ecology in unfamiliar environments, including monitoring the progress of teams and taking responsibility for task outcomes.
 - Effectively identify, evaluate and address his/her learning needs in a self-directed manner, and to facilitate collaborative learning processes.
 - Demonstrate the ability to take full responsibility for his or her work, including acting professionally and ethically when working with microorganisms, always maintaining an awareness of public and/or environmental safety.

Aan die einde van die module moet die student in staat wees om:

- 'n Geïntegreerde kennis van mikrobiële diversiteit te kan demonstreeer en te kan verduidelik hoe dit op die mens en die omgewing impakteer.
- Standaard metodes en prosedures te implementeer om mikrobiële diversiteit te evalueer en om die impak op die omgewing te meet; gebruik te maak van praktiese vaardighede wat in die module bemeester is om mikrobiële diversiteit te bepaal met behulp van taksonomiese prosedures.
- Komplekse probleme effektief te identifiseer en te analiseer en bewysgebaseerde oplossings en teoriegedrewe argumente toe te pas.

- Die vermoë demonstree om inligting te versamel uit literatuur en ander bronne, of deur eksperimentering, en om hierdie inligting te analiseer en te verwerk. Dit sluit ook in die vermoë om onafhanklik te bevestig of die inligting en data betroubaar is of nie.
- In staat wees om take wat verband hou met mikrobiëse diversiteit en ekologie in onbekende omgewings te interpreteer en te bestuur, insluitend die monitering van groepwerk en om verantwoordelikheid te aanvaar vir die uitkoste van 'n span se take.
- Effektief sy/haar leerbehoefes kan identifiseer, evalueer en aanspreek op 'n self-gedrewe wyse om gesamentlike leerprosesse te fasiliteer.
- Die vermoë demonstree om volle verantwoordelikheid te neem vir sy of haar werk, insluitend professionele en etiese gedrag wanneer daar met mikroörganismes gewerk word, terselfdertyd ook bewustheid handhaaf vir publieke- en/of omgewingsveiligheid

Module code: MKBS326

Semester 2

NQF Level: 7

Title: Industrial Microbiology and Biotechnology

At the end of the module the student should demonstrate:

- an understanding of food preservation and microbial growth.
- an understanding of microbial sampling techniques for assessing microbial contaminants in food and food poisoning.
- an understanding of Single cell proteins as source of food.
- an understanding of the products from genetic engineering.
- an understanding of the application of microorganisms in bbiotechnology and their use in the production of pharmaceuticals.
- an understanding of bioterrorism as well as the criteria used in classifying microorganisms as agents of bioterrorism.
- an understanding of the use of microorganisms as pesticides.
- an understanding of Nanotechnology and Biochemistry of bioremediation

Module code: MKBS327

Semester 2

NQF Level: 7

Title: Virology and Immunology

At the end of the module the student should demonstrate:

- an understanding of the essentials of immunology and molecular immunology.
- an understanding of the early development of Virology
- an understanding of classification schemes used to place both bacteria and Archaeal Viruses into different groups
- an understanding of the taxonomy of Eucaryotic viruses
- an understanding of the general properties of bacteriophages/viruses including their cultivation techniques
- an understanding of the reproduction of bacterial and vertebrate Viruses
- an understanding of the construction and characterization of virus-like particles
- an understanding of cytocidal Infections and cell damage
- an understanding of persistent, Latent and slow virus infections.
- an understanding of vector-borne and soil borne microbial diseases
- an understanding of immunology in host defense and disease

Module code: MKBX213	Semester 1	NQF Level: 6
Title / Titel: Microbiology for Food and Nutrition / Mikrobiologie vir Voedsel en Voeding		
<p>Module outcomes / <i>Module uitkomst</i>:</p> <p>After completion of the module, the student should be able to:</p> <ul style="list-style-type: none"> • demonstrate knowledge concerning microbiological aspects of laboratory techniques, preparation and storage of food and microbiological food safety in a selective way; • apply basic laboratory techniques used in microbiological laboratories; • demonstrate competency with regard to elementary research techniques, group work, writing of reports and problem solving by means of case studies; • maintain strict ethical principles in all circumstances and show respect for life throughout. <p><i>Na voltooiing van die module moet die student in staat wees om:</i></p> <ul style="list-style-type: none"> • u kennis met betrekking tot die Mikrobiologiese aspekte van laboratoriumtegnieke, voedselvoorbereiding en -berging, asook die mikrobiologiese veiligheid van voedsel op 'n geselekteerde wyse te demonstreer; • basiese laboratoriumtegnieke wat in 'n Mikrobiologiese laboratorium gebruik word, toe te pas; • u vaardighede met betrekking tot elementêre navorsings-tegnieke, groepwerk, die skryf van verslae en probleem-oplossing deur middel van gevallestudies te toon. • streng etiese beginsels in alle omstandighede te handhaaf en deurgaans respek vir lewe te toon 		
Module code: MKPN111	Semester 1	NQF-level: 5
Title / Titel: Microbiology for Pharmacy / Mikrobiologie (vir Farmasie)		
<p>Module outcomes / <i>Module uitkomst</i>:</p> <p>After completion of the module, the student should be able to:</p> <ul style="list-style-type: none"> • demonstrate knowledge of microbiology and its relation to pharmaceutical and occupational health sciences; • apply knowledge of infectious diseases, infection control and related procedures within the health care context; • demonstrate and apply specific microbiology laboratory techniques; • exhibit skills in elementary research techniques, group work, report writing and problem solving through case studies; • uphold strict ethical principles in all situations and show respect for life without exception. <p><i>Na voltooiing van die module moet die student in staat wees om:</i></p> <ul style="list-style-type: none"> • kennis van mikrobiologie en die verband met farmaseutiese en beroepsgesondheid wetenskappe te demonstreer; • kennis toe te pas van infektiewe siektes, beheer van infeksie en verwante prosedures binne die gesondheidsorg konteks; • spesifieke mikrobiologiese laboratoriumtegnieke te kan demonstreer en toepas; • vaardighede te toon in basiese navorsingstegnieke, groepwerk, skryf van verslae en probleemoplossing deur gevallestudies; • streng etiese beginsels in alle situasies toe te pas en sonder uitsondering respek te toon vir lewe. 		

Module code: PLKS111/171	Semester 1	NQF Level: 5
<p>Title / Titel: Plant structure and function / Plantstruktuur en –funksie</p>		
<p>Module outcomes / Module uitkomst:</p> <p>After completion of the PLKS111 module, the student should demonstrate:</p> <ul style="list-style-type: none"> • fundamental knowledge of the relevance of plants to life on earth and how plants are structurally and functionally adapted. • ability to select, distinguish and organize standard methods and procedures to identify basic plant structures and their respective functions. • an ability to access and process information from different sources with a view to compare and summarise scientific information on plant uses. • coherent understanding of the ethical implications of decisions, actions and practices pertaining to the use of plants. • identify and apply acceptable and independent self-study methods and exhibit adherence to rules on plagiarism and copyright principles. <p><i>Na voltooiing van die PLKS111 module, moet die student die volgende kan demonstreer:</i></p> <ul style="list-style-type: none"> • <i>fundamentele kennis van die belang van plante vir lewe of aarde en hoe plante struktureel en funksioneel aangepas is.</i> • <i>vermoë om standaardmetodes en prosedures te selekteer, onderskei en organiseer om basiese plantstrukture en hul onderskeie funksies te kan identifiseer.</i> • <i>vermoë om inligting vanuit verskeie bronne te bekom en te prosesseeer met die oogmerk om wetenskaplike kennis oor plantgebruike te vergelyk en op te som.</i> • <i>samehangende begrip van die etiese implikasies van besluite, aksies en praktyke met betrekking tot die gebruik van plante.</i> • <i>identifiseer en pas aanvaarbare- en onafhanklike selfstudiemetodes toe en toon gehoorsaamheid aan reëls oor plagiaat en kopiereg beginsels.</i> 		

Module code: PLKS121/172	Semester 2	NQF Level: 5
<p>Title / <i>Titel</i>: Biodiversity and Environmental Botany / <i>Biodiversiteit en omgewingsplantkunde</i></p>		
<p>Module outcomes / <i>Module uitkomst</i>: After completion of the PLKS121 module, the student should demonstrate:</p> <ul style="list-style-type: none"> • Knowledge and informed understanding of key terms, principles, concepts, facts, rules and theories used in the field of Biodiversity and Environmental Botany. • Basic knowledge and informed understanding of taxonomic principals, including evolution and classification, in order to distinguish and compare different prokaryotic organisms, algae and plants. • The ability to apply standard methods, procedures and techniques commonly used in botanical studies to study characteristics of living organisms in order to identify, name, illustrate and classify them. • An understanding of the ecological interactions between organisms and describe the bio-physical and socio-economic impacts on ecosystems for sustainable management and improved livelihoods. • The ability to communicate verbally and in writing and gather information reliably and accurately from a range of sources in order to do elemental research in a scientific way by using conventional methods and basic technologies. • An ability to monitor his/her own learning progress individually and in groups, and implement relevant learning strategies in Biodiversity and Environmental Botany. • Ethical and professional behaviour within the academic environment, inclusive of adherence to rules on plagiarism and copyright principles. <p><i>Na voltooiing van die PLKS121 module, moet die student die volgende kan demonstreer:</i></p> <ul style="list-style-type: none"> • <i>Kennis en ingeligte begrip van sleutel terme, beginsels, konsepte, feite, reëls en teorieë wat gebruik word in die veld van Biodiversiteit en Omgewingsplantkunde.</i> • <i>Basiese kennis en ingeligte begrip van taksonomiese beginsels, insluitende evolusie en klassifikasie, om sodoende verskillende prokariotiese organismes, alge en plante te kan onderskei en met mekaar te kan vergelyk.</i> • <i>Die vermoë om standaard metodes, prosedure en tegnieke wat algemeen in plantkundige studies gebruik word, toe te pas om die eienskappe van lewende organismes te bestudeer ten einde hulle te identifiseer, benaam, illustreer en klassifiseer.</i> • <i>'n Begrip van die ekologiese wisselwerking tussen organismes, asook die vermoë om die biofisiese en sosio-ekonomiese impakte van ekosisteme vir volhoubare bestuur en verbeterde lewenstandaard te kan beskryf.</i> • <i>Die vermoë om te kommunikeer, beide verbaal en in geskrewe vorm, asook die vermoë om inligting in te samel op 'n betroubare en akkurate wyse deur gebruik te maak van 'n verskeidenheid bronne om sodoende elementêre navorsing te doen op 'n wetenskaplike manier deur die gebruik van konvensionele metodes en basiese tegnologie.</i> • <i>Die vermoë om sy/haar eie studievordering te monitor, individueel en in groepe, en om relevante leerstrategieë te implementeer in sy/haar studies van Biodiversiteit en Omgewingsplantkunde.</i> • <i>Etiese en professionele gedrag binne die akademiese omgewing, insluitend om hom/haar te onderwerp aan reëls oor plagiaat en kopiereg beginsels.</i> 		

Module code: PLKN213	Semester 1	NQF Level: 6
Title / Titel : Plant Genomics / Plantgenomika		
Module outcomes / <i>Module uitkomst</i> : After completion of the PLKN213 module, the student should demonstrate:		
<ul style="list-style-type: none"> • have at his or her disposal detailed knowledge of the genomic structure of plant cells, plant gene expression and the regulation thereof; • have an understanding of certain recombinant DNA technologies; • be able to evaluate and select appropriate molecular methods for conducting investigations in plant physiology, plant systematics or plant ecology; • be able to demonstrate limited practical molecular skills, including an understanding of the generation, presentation and interpretation of data, as well as the formulation of theories about data; • be able to exhibit sensitivity for the role that values play in biotechnology; and • be able to evaluate relevant ethical issues in terms of a world view. 		
<i>Na voltooiing van die PLKN213 module, moet die student die volgende kan demonstreeer:</i>		
<ul style="list-style-type: none"> • <i>oor breedvoerige kennis van die genomiese struktuur van plantselle, die uitdrukking van plantgene en die regulering daarvan hê;</i> • <i>begrip van sekere rekombinante DNS-tegnologieë hê;</i> • <i>in staat wees om toepaslike molekulêre metodes vir ondersoek in plantfisiologie of plantsistematiek of plant-ekologie te evalueer en te selekteer;</i> • <i>in staat wees om beperkte praktiese molekulêre vaardighede, met inbegrip van die generering, aanbieding en vertolking van data, asook die vorming van teorieë rondom die data te demonstreeer;</i> • <i>in staat wees om sensitiwiteit te toon vir die rol van waardes in biotegnologie; en in staat wees om tersaaklike aangeleenthede uit die oogpunt van 'n wêreldbeskouing te evalueer</i> 		
Module code: PLKS221	Semester 2	NQF Level: 6
Title / Titel : Flora of South Africa (Plant Systematics and Phytogeography) / Flora van Suid-Afrika (plantsistematiek en fitogeografie)		
Module outcomes / <i>Module uitkomst</i> : After completion of the PLKS221 module, the student should demonstrate:		
<ul style="list-style-type: none"> • detailed knowledge of the flora of southern Africa and a clear understanding of geobotany. • ability to evaluate and select the most appropriate methods and procedures to gather necessary evidence to identify taxonomic and phytogeographic entities. • coherent understanding of the ethical implications of decisions, actions and practices that might impact the southern African flora. • ability to access, process, present and communicate information on a discipline-related topic in plant diversity and distribution. • ability to recognize major threats to southern Africa's flora, and to propose possible solutions to address and mitigate such threats. • learning and management strategies to sustain professional development in geobotany. • appreciation for the rich floristic diversity of southern Africa and a responsibility to develop an understanding thereof. 		

Module outcomes / *Module uitkomst:*

Na voltooiing van die PLKS221 module, moet die student die volgende kan demonstreer:

- *gedetailleerde kennis van die flora van suider-Afrika en 'n duidelike begrip van geobotanie.*
- *vermoë om gepaste metodes en prosedures te evalueer en te selekteer waarmee nodige bewyse versamel kan word om taksonomiese en fitogeografiese entiteite te identifiseer.*
- *samehangende begrip van die etiese implikasies met betrekking tot besluite, aksies en praktyke wat 'n impak het op die suider-Afrikaanse flora.*
- *vermoë om inligting oor 'n onderwerp wat verband hou met die dissipline van plantdiversiteit en -verspreiding te bekom, te prosesseer, aan te bied en te kommunikeer.*
- *vermoë om die hoof bedreigings van die suider-Afrikaanse flora uit te ken, en om moontlike oplossings voor te stel om sulke bedreigings aan te spreek en te versag.*
- *studie- en bestuurstrategieë om professionele ontwikkeling in geobotanie te ondersteun.*
- *'n waardering vir die ryk floristiese diversiteit van suider-Afrika en 'n verantwoordelikheid om 'n begrip daarvan te ontwikkel*

Module code: PLKS312

Semester 1

NQF Level: 7

Title / Titel: Plant Physiology / Plantfisiologie

Module outcomes / *Module uitkomst:*

After completion of the PLKS312 module, the student should demonstrate:

- Integrate knowledge related to whole plant water relations, photosynthesis and respiration, including an understanding of the processes of photosynthesis and respiration.
- Evaluate and judge energy conservation in photosynthesis and respiration.
- Demonstrate the ability to identify, analyse and reflect on the environmental influences on whole plant water relations, photosynthesis and respiration.
- Access, evaluate and identify the scientific evidence supporting hypotheses and assumptions related to whole plant water relations, photosynthesis and respiration.
- Identify, analyse, critically reflect on, and address complex challenges related to whole plant water relations, photosynthesis and respiration and apply evidence-based solutions with theory-driven arguments.
- Demonstrate the ability to identify, evaluate and address his or her learning needs in a self-directed manner, and to facilitate collaborative learning processes.
- Demonstrate the ability to take full responsibility for his or her own work, decision making and use of resources.

Na voltooiing van die PLKS312 module, moet die student die volgende kan demonstreer:

- *Kennis wat verband hou met fotosintese en respirasie te integreer asook om die prosesse van fotosintese en respirasie te verstaan.*
- *Die bewaring van energie in fotosintese en respirasie te evalueer en te kan oordeel.*
- *Die vermoë te kan demonstreer om omgewings invloede op heeplant watterverhoudings, fotosintese en respirasie te kan identifiseer, analiseer en om daarop te kan reflekteer.*
- *Die wetenskaplike bewyse wat hipoteses en aannames ondersteun te kan assesseer, evalueer en te identifiseer wat verband hou met heeplant watterverhoudings, fotosintese en respirasie.*
- *Komplekse uitdagings wat verband hou met heeplant watterverhoudings, fotosintese en respirasie te identifiseer, analiseer, krities daarop te reflekteer en aan te spreek met bewys gebaseerde oplossings gegrond op teorie gedrewe argumente.*

- *Hul vermoë om eie leerbehoefes te identifiseer, te evalueer en aan te spreek te demonstreer asook om samewerkende leerprosesse te fasiliteer.*
- *Die vermoë demonstreer om volle verantwoordelikheid vir hom of haar eie werk te neem asook eie besluitneming en gebruik van hulpbronne.*

Module code: PLKS313 (MC only)

Semester 1

NQF Level: 7

Title / Titel: Terrestrial Plant Ecology: Ecosystems, Populations and Interactions / Terestriële Plantekologi: Ekosisteme, Populasies en Interaksies

Module outcomes / *Module uitkomst:*

Third year Botany students registered for PLKN313 must attend a compulsory field trip/excursion during the first semester. This field trip/excursion forms an integral part of this module and is to be evaluated upon. No excuses for absence from the field trip/excursion will be accepted, except in the event of illness in which case a medical certificate must be presented.

After completion of the PLKS313 module, the student should demonstrate:

- Integrated knowledge and clear understanding of, as well as have the ability to evaluate and apply key terminology, concepts, facts, rules and theories used in the field of basic and applied terrestrial plant ecology.
- Accurate and coherent written and verbal communication with understanding of and respect for intellectual property conventions, copyright and rules on plagiarism.
- Ability to select, evaluate and apply appropriate quantitative and qualitative vegetation survey and data analysis techniques commonly used in terrestrial ecology.
- Ability to access, analyse and evaluate current research and scientific methods to be able to do focused research and resolve problems within the fields of terrestrial ecology.
- Ability to analyse and critically reflect on the ecological functioning of terrestrial systems, the ability to reflect on the values, ethical conduct and justifiability of decisions appropriate to the practice of Plant Ecology in especially semi-arid environments.
- Application of basic principles with regard to plant growth dynamics and landscape ecology, especially where man interact with the natural environment causing land degradation.
- Knowledge of resource conservation and utilisation, and the influence of aspects such as ecosystem management, degradation and urbanisation on resource conservation and utilisation, especially with regard to food security.
- Responsibility for personal learning needs, monitoring of own learning progress and application of relevant learning strategies and management of all resources to successfully realise all outcomes of this module.

Derdejaar Plantkunde studente wat vir PLKN323 en PLTN323 registreer moet 'n verpligte velduitstapjie gedurende die eerste semester (dit kan die naweke asook die reses insluit) bywoon. Die resultate wat verkry word, moet in verslagvorm ingehandig word en dit sal bydra tot die deelnamepunt. Geen verskonings sal aanvaar word nie, behalwe in die geval van siekte in welke geval 'n mediese sertifikaat voorgelê moet word.

Na voltooiing van die PLKS313 module, moet die student die volgende kan demonstreer:

- *Geïntegreerde kennis en begrip van, sowel as die vermoë om sleutelterminologie, konsepte, feite, reëls en teorieë wat op die gebied van basiese en toegepaste terestriële plantekologie gebruik word, te evalueer en toe te pas.*

- *Akkurate en samehangende skriftelike en verbale kommunikasie met begrip van en respek vir intellektuele eiendomskonvensies, kopiereg en reëls oor plagiaat.*
- *Vermoë om toepaslike kwantitatiewe en kwalitatiewe plantkundige opname en data-analise tegnieke wat algemeen in terrestriële ekologie gebruik word, te selekteer, evalueer en toe te pas.*
- *Die vermoë om aktuele navorsing en wetenskaplike metodes te kan analiseer en te evalueer om gefokusde navorsing te kan doen en probleme op te los binne terrestriële ekologie.*
- *Die vermoë om te analiseer en krities te reflekteer oor die ekologiese funksionering van terrestriële sisteme, die vermoë om te besin oor die waardes, etiese gedrag en regverdigbaarheid van besluite wat toepaslik is vir die gebruik van Plantekologie in veral semi-ariëde omgewings.*
- *Toepassing van basiese beginsels ten opsigte van plantgroeidinamika en landskapsekologie, veral waar die mens met die natuurlike omgewing in wisselwerking is wat dan landdegradasie veroorsaak.*
- *Kennis van hulpbronnabewaring en -benutting en die invloed van aspekte soos ekosisteembestuur, degradasie en verstedeliking op hulpbronnabewaring en -benutting, veral ten opsigte van voedselsekureit.*
- *Verantwoordelikheid vir persoonlike leerbehoefes, monitering van eie leervordering, en toepassing van relevante leerstrategieë en bestuur van alle bronne om alle uitkomst van hierdie module suksesvol te verwesenlik.*

Module code: PLKN323

Semester 2

NQF Level: 7

Title / Titel: Plant Ecology / Plantekologie

Module outcomes / *Module uitkomst:*

hird year Botany students registered for PLKN323 and PLTN323 must attend a compulsory field trip during the first semester (that can include weekends and the recess time). The report generated from results obtained during the field trip will contribute to the participation mark. No excuses for absence from the field trip will be accepted, except in the event of illness in which case a medical certificate must be presented.

After completion of the PLKN323 module, the student should demonstrate:

- Integrated knowledge and clear understanding of, as well as have the ability to evaluate and apply key terminology, concepts, facts, rules and theories used in the field of basic and applied aquatic and terrestrial ecology.
- The ability to select, evaluate and apply appropriate quantitative and qualitative vegetation survey and data analysis techniques commonly used in terrestrial ecology.
- The ability to analyse and critically reflect on the ecological functioning of inland water systems with particular emphasis on interactions between physical, chemical and biological variables.
- The ability to access, analyse and evaluate current research and scientific methods to be able to do focused research and resolve problems within the fields of aquatic and terrestrial ecology.
- The ability to reflect on the values, ethical conduct and justifiability of decisions appropriate to the practice of Plant Ecology in aquatic and terrestrial environments.
- Full responsibility for his/her own learning needs, monitoring of own learning progress and application of relevant learning strategies and management of all resources to successfully realise all outcomes of this module.
- Accurate and coherent written and verbal communication with understanding of and respect for intellectual property conventions, copyright and rules on plagiarism.

A research project must be completed under the supervision of a study leader during the year. The mark for this project will contribute towards the participation mark for this module.

Derdejaar Plantkunde studente wat vir PLKN323 en PLTN323 registreer moet 'n verpligte velduitstap gedurende die eerste semester (dit kan die naweke asook die reses insluit) bywoon. Die resultate wat verkry word, moet in verslagvorm ingehandig word en dit sal bydra tot die deelnamepunt. Geen verskonings sal aanvaar word nie, behalwe in die geval van siekte in welke geval 'n mediese sertifikaat voorgelê moet word.

Na voltooiing van die PLKN323 module, moet die student die volgende kan demonstreer:

- *Geïntegreerde kennis en duidelike begrip asook die vermoë om sleutelterminologie, -konsepte, -feite, reëls en teorieë in die veld van basiese, asook toegepaste akwatiese en terrestriële ekologie te evalueer en toe te pas.*
- *Die vermoë om geskikte kwantitatiewe en kwalitatiewe plantopnames en data analise tegnieke wat algemeen in terrestriële ekologie gebruik word, te selekteer, evalueer en toe te pas.*
- *Die vermoë om die ekologiese werking van binnelandse watersisteme, met klem op die interaksies tussen fisiese, chemiese en biologiese veranderlikes, te analiseer en krities daarop te reflekteer.*
- *Die vermoë om toegang te verkry tot hedendaagse navorsing en hierdie navorsing, asook wetenskaplike metodes te analiseer en te evalueer om sodoende in staat te wees tot gefokusde navorsing en die oplossing van probleme binne die veld van akwatiese en terrestriële ekologie.*
- *Die vermoë om te reflekteer oor waardes, etiese gedrag en verantwoordbaarheid van besluite wat van toepassing is op Plantekologie in akwatiese en terrestriële omgewings.*
- *Volle verantwoordelikheid vir sy/haar eie leerprosesse, die monitering van sy/haar studievordering en die toepassing van relevante leerstrategieë asook die bestuur van alle hulpbronne om sodoende sukses te behaal met die bereiking van alle uitkomst van hierdie module.*
- *Akkurate en samehangende geskrewe en verbale kommunikasie met die begrip van en respek vir intellektuele eiendomswaardes, kopiereg en reëls met betrekking tot plagiaat.*

'n Navorsingsprojek moet gedurende die jaar onder toesig van 'n studieleier voltooi word. Die punt vir die projek sal tot die deelnamepunt vir hierdie module bydra.

Module code: PLKN324 (MC only)	Semester 2	NQF Level: 7
Title / Titel: Plant Development and Molecular Physiology / Plantontwikkeling en Molekulêrefisiologie		
<p>Module outcomes / <i>Module uitkomst</i>: After completion of the PLKN324 module, the student should demonstrate:</p> <ul style="list-style-type: none"> • An integrated understanding of the basic biological principles of plant growth and development. • A broad-spectral understanding of the stages and processes governing growth and development in selected plant species. • A concerted conceptualization of the genetic and environmental factors that influence the growth and development of plants. • A comprehensive understanding of the biochemical and hormonal regulatory mechanisms of plant growth and development. • An understanding of the basic principles of plant physiology. • A basic understanding of plant metabolism. • A fundamental conceptualization of the structure and functional processes of plants. • A basic appreciation of the morphological and anatomical structures of plants in relation to their function. • An understanding of the mechanisms by which plants respond to the various genetic and environmental factors. <p><i>Na voltooiing van die PLKN324 module, moet die student die volgende kan demonstreer:</i></p> <ul style="list-style-type: none"> • 'n Geïntegreerde begrip van die basiese biologiese beginsels van plantegroei en -ontwikkeling. • 'n Breëspektrale begrip van die stadiums en prosesse wat groei en ontwikkeling in geselekteerde plantspesies beheer. • 'n Daadwerklike konseptualisering van die genetiese en omgewingsfaktore wat die groei en ontwikkeling van plante beïnvloed. • 'n Omvattende begrip van die biochemiese en hormonale regulerende meganismes van plantegroei en -ontwikkeling. • 'n Begrip van die basiese beginsels van plantfisiologie. • 'n Basiese begrip van plantmetabolisme. • 'n Fundamentele konseptualisering van die struktuur en funksionele prosesse van plante. • 'n Basiese waardering van die morfologiese en anatomiese strukture van plante in verhouding tot hul funksie. • 'n Begrip van die meganismes waardeur plante reageer op die verskillende genetiese en omgewingsfaktore. 		

Module code: PLTN323	Semester 2	NQF Level: 7
Title / Titel: Plant Ecology: Tourism / Plantekologie: Toerisme		
Module outcomes / <i>Module uitkomst:</i>		
<p>Third year Botany students registered for PLKN323 and PLTN323 must attend a compulsory field trip during the first semester (that can include weekends and the recess time). The report generated from results obtained during the field trip will contribute to the participation mark. No excuses for absence from the field trip will be accepted, except in the event of illness in which case a medical certificate must be presented.</p>		
<p>On completing the module the student should be able to apply basic ecological principles; to discuss ecological interactions and examples thereof; to understand and apply basic principles with regard to plant growth dynamics and landscape ecology; to discuss resource conservation and utilisation, and the influence of aspects such as ecosystem management, degradation, restoration and rehabilitation, and urbanisation on resource conservation and utilisation, as specific case studies, also in the tourism industry; to integrate knowledge of the influence people and changing environmental conditions have on ecosystems; to master various data collecting techniques and apply multiple data analytical procedures on environmental data; to explain the water situation over a wide range in South Africa and the importance of utilising inland water as a limited resource, as well as to discuss the influence of human beings on water quality and the utilisation of inland waters, also in the tourism industry. A research project must be completed under the supervision of a study leader this year. The mark for this project will contribute towards the participation mark for this module</p>		
<p><i>Derdejaar Plantkunde studente wat vir PLKN323 en PLTN323 registreer moet 'n verpligte velduitstap gedurende die eerste semester (dit kan naweke en die reses insluit) bywoon. Die resultate wat verkry word, moet in verslagvorm ingehandig word en dit sal bydra tot die deelnamepunt. Geen verskonings sal aanvaar word nie, behalwe in die geval van siekte in welke geval 'n mediese sertifikaat voorgelê moet word.</i></p>		
<p><i>Na voltooiing van die module behoort die student in staat te wees om: basiese ekologiese beginsels toe te pas; ekologiese interaksies en voorbeelde daarvan te bespreek; basiese beginsels t.o.v. Plantegroei-dinamika en Landskapsekologie te verstaan en toe te pas; hulpbronnabewaring en -benutting en die invloed van aspekte soos ekostelselbestuur, degradasie, restorasie en rehabilitasie en verstedeliking daarop te bespreek as spesifieke gevallestudies ook binne die toerismebedryf; kennis van die invloed van mense en veranderde omgewingstoestande op ekostelsels te integreer; verskillende data-insamelingstegnieke te bemeester en meervoudige data-analitiese prosedures aan te wend op omgewingsdata; die breë watersituasie in Suid-Afrika en die belang van die benutting van binnelandse water as beperkte hulpbronnabewaring te verduidelik asook die invloed van die mens op waterkwaliteit en die benutting van binnelandse waters, ook binne die toerismebedryf, te bespreek. 'n Navorsingsprojek moet gedurende die jaar onder toesig van 'n studieleier voltooi word. Die punt vir die projek sal tot die deelnamepunt vir hierdie module bydra.</i></p>		

NAS.2.8.20 URBAN AND REGIONAL PLANNING / STADS- EN STREEKBEPLANNING

Module code / Modulekode: SBSS111	Semester 1	NQF level / NKR vlak: 5 Credits / Krediete: 12
<p>Title: Planning and settlement history <i>Titel: Beplannings- en nedersettingsgeskiedenis</i></p>		
<p>Module outcomes: On successful completion of this module, students should be able to demonstrate:</p> <ul style="list-style-type: none"> integrated knowledge of the establishment, origin and development of cities of different historical civilisations including an understanding of the relevance of a historical study of settlements and cities for urban and regional planning; an awareness of how settlements and cities have developed historically and to evaluate their value and impact on urban and regional planning; the ability to identify and evaluate problems within the historical establishment, origin and development of cities and to apply solutions based on relevant urban and regional planning principles; and the ability to communicate information on planning and settlement history reliably, accurately and coherently in written form, or verbally, or by means of practical demonstration. <p><i>Module uitkomst:</i> Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:</p> <ul style="list-style-type: none"> geïntegreerde kennis te demonstreer van die vestiging, ontstaan en ontwikkeling van stede van verskillende geskiedkundige beskawings en om 'n begrip te toon van die relevansie van 'n geskiedkundige studie van nedersettings en stede vir stads- en streekbeplanning; 'n bewustheid te demonstreer van die wyse waarop nedersettings en stede geskiedkundig ontwikkel het en om die waarde en impak daarvan op stads-en streekbeplanning te kan evalueer; die vermoë te demonstreer om probleme binne die geskiedkundige vestiging, ontstaan en ontwikkeling van stede te identifiseer, evalueer en om oplossings toe te pas gebaseer op relevante stads-en streekbeplanningsbeginsels; en die vermoë te demonstreer om inligting rakende beplannings- en nedersettingsgeskiedenis betroubaar, akkuraat en samehangend te kommunikeer in geskrewe vorm, of verbaal, of d.m.v. praktiese demonstrasie. 		
<p>Method of delivery: Full-time <i>Metode van aflewering: Voltyds</i></p>		
<p>Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 35% in order to qualify for the summative assessment opportunities. <i>Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 35% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleenthede.</i></p>		
Module code / Modulekode: SBSS121	Semester 2	NQF level / NKR vlak: 5 Credits / Krediete: 12
<p>Title: Introduction to Planning / <i>Titel: Inleiding tot Beplanning</i></p>		
<p>Module outcomes: On successful completion of this module, students should be able to demonstrate:</p> <ul style="list-style-type: none"> basic knowledge and informed understanding of fundamental Urban and Regional planning theories, concepts, principles, and approaches; fundamental knowledge and understanding of the different modern and post-modern planning models, including those that apply to South Africa; 		

- basic research skills in collecting, reading, summarising, interpreting and communicating information reliably, accurately and coherently, using conventions appropriate to the context, either in writing, verbally or in practical demonstration; and
- the ability to act ethically in presenting knowledge relating to the planning of cities and regions.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om die volgende te kan demonstreer:

- *basiese kennis en ingeligte begrip van fundamentele stedelike en streekbeplanningsteorieë, konsepte, beginsels en benaderings;*
- *fundamentele kennis en begrip van die verskillende moderne en post-moderne beplanningsmodelle, insluitend dié wat van toepassing is op Suid-Afrika;*
- *basiese navorsingsvaardighede om inligting betroubaar, akkuraat en samehangend te versamel, te lees, op te som, te interpreteer en te kommunikeer deur gebruik te maak van konvensies wat toepaslik is vir die konteks, hetsy skriftelik, mondeling of practise; en*
- *die vermoë om eties te handel in die aanbieding van kennis met betrekking tot die beplanning van stede en streke.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleenthede.

Module code /

Semester 1

NQF level / NKR vlak: 6

Modulecode: SBES212

Credits / Krediete: 16

Title: Layout planning / Titel: Uitlegbeplanning

Module outcomes:

On successful completion of this module, students should be able to:

- comprise detailed knowledge relating to the different types of layouts, the concepts, approaches and principles applicable thereto and the manner in which it relates to other disciplines;
- demonstrate a comprehension of what the different sources of cadastral, legal and physical aspects entail and be mindful of the possible impact thereof on the design and planning of a site;
- acquire and collect the different sources of cadastral, legal and physical data and correctly evaluate, research and select which aspects thereof will affect the planning and design of a terrain;
- identify, evaluate and solve possible problems relating to the planning of a site within the context of current norms, standards and design principles that are applicable and being presented in professional practice;
- illustrate the planning and design of a terrain in an ethical and accountable manner through appropriate drawing techniques and display awareness of what the impact of the decisions and actions by the planner could be on the future development of a site; and
- illustrate the planning and design of a site, by applying prevailing norms, standards and design principles in relation and in context to the impact that cadastral, legal and physical constraints have on a site.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:

- *oor gedetailleerde kennis te beskik aangaande verskillende tipes uitlegte, die konsepte, benaderings en beginsels van toepassing hierop en die wyse waarop dit verband hou met ander dissiplines;*
- *kennis te demonstreeer wat die verskillende bronne van kadastrale-, wetlike- en fisiese, aspekte behels en bewus wees van wat die moontlike impak hiervan op die ontwerp en beplanning van 'n terrein sal wees;*
- *die verkryging en insameling van die verskillende bronne van kadastrale-, wetlike- en fisiese data korrek te kan evalueer, na te vors en te selekteer watter aspekte hiervan wel 'n impak op die beplanning en ontwerp van 'n terrein sal hê;*
- *moontlike probleme tydens die beplanning en ontwerp van 'n terrein te kan identifiseer, te evalueer en op te los binne die konteks van heersende norme, standaarde en ontwerpbeginsels wat van toepassing is en voorgelou word in die professionele praktyk;*
- *die beplanning en ontwerp van 'n terrein op eties verantwoordbare wyse, deur toepaslike tekentegniese te kan illustreer, en bewustheid te toon van wat die besluite en aksies van die beplanner op die toekomstige ontwikkeling van 'n terrein sal wees; en*
- *die beplanning en ontwerp van 'n terrein, deur die toepassing van heersende norme, standaarde en ontwerpbeginsels in verhouding en konteks tot die impak wat kadastrale-, wetlike- en fisiese beperkings op 'n terrein het, te kan illustreer.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleenthede.

Module code /

Modulekode: SBRS221

Semester 2

NQF level / NKR vlak: 5

Credits / Krediete: 16

Title: Regional plans / Titel: Streekplanne

Module outcomes:

On successful completion of this module, students should be able to:

- demonstrate detailed knowledge and understanding of the principles and theories of regional planning, as well as the application thereof in regional plans;
- demonstrate insight into the origin and development of policy approaches and applications of regional plans in Africa and South Africa;
- demonstrate the ability to identify and analyse regional planning approaches, as well as evaluate metropolitan and regional plans in developed countries;
- demonstrate the ability to identify, analyse and solve complex problems with regard to regional plans, regional policy and regional planning instruments;
- demonstrate an understanding of the relationship between urban systems and regional plans in order to formulate a well-founded written and verbal opinion; and
- demonstrate coherent understanding of the ethical implications of decisions, actions and practices specifically relevant to proposals for regional plans.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:

- *detail kennis en begrip te demonstreeer van die beginsels en teorieë van streekbeplanning, asook die toepassing daarvan in streekplanne;*

- *insig te demonstreeer in die ontstaan en ontwikkeling van beleidsbenaderings en toepassings van streekplanne in Afrika en Suid-Afrika;*
- *die vaardigheid te demonstreeer vir die evaluering en toepassing van streekbeplanningsbenaderings, metropolitaanse- en streekplanne in ontwikkelde lande; die vermoë te demonstreeer om streekbeplanningbenaderings te identifiseer en te ontleed, asook om metropolitaanse en streekplanne in ontwikkelde lande te evalueer;*
- *die vermoë demonstreeer ten einde komplekse probleme te identifiseer, analiseer en op te los met betrekking tot streekplanne, beplanningsbeleide en -instrumente;*
- *die verhouding tussen stedelike sisteme en streekplanne te verstaan ten einde 'n eie begronde mening skriftelik en mondelings te kan weergee; en*
- *samehangende begrip te demonstreeer van die etiese implikasies van besluite, aksies en praktyke wat spesifiek relevant is vir voorstelle vir streekplanne.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleenthede.

Module code /

Semester 2

NQF level / NKR vlak: 6

Modulekode: SBSS223

Credits / Krediete: 16

Title: Urban design / *Titel: Stedelike ontwerp*

Module outcomes:

On successful completion of this module, students should be able to demonstrate:

- insight and understanding of theoretical concepts space, place, place-making, design and urban design;
- analytical skills in selecting and applying various urban design methods and procedures;
- critical thinking by evaluating existing areas in the environment as well as urban design proposals for various areas;
- practical skills in terms of developing creative urban design solutions for urban and/or rural areas and presenting the designs in written, visual and oral format whether individually or in a group; and
- ethical and professional behaviour in terms of urban design applications.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om die volgende te demonstreeer:

- *insig en begrip van teoretiese konsepte ruimte, plek, plekskepping, ontwerp en stedelike ontwerp;*
- *analitiese vaardighede in die keuse en toepassing van verskeie stedelike ontwerpmetodes en prosedures;*
- *kritiese denke deur die evaluering van bestaande areas in die omgewing sowel as stedelike ontwerp voorstelle vir verskeie areas;*
- *praktiese vaardighede in terme van die ontwikkeling van kreatiewe stedelike ontwerp oplossings vir stedelike en/of landelike area sowel as die voorlegging van die ontwerpe in geskrewe, visuele en mondelinge formaat hetsy individueel of in groepsverband; en*
- *etiese en professionele optrede in terme van die toepassing van stedelike ontwerp.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleentheid.

**Module code /
Modulekode: SBRS313**

Semester 1

**NQF level / NKR vlak: 7
Credits / Krediete: 16**

Title: Regional development theory / Titel: Streekontwikkelingsteorie

Module outcomes:

On successful completion of this module, students should be able to demonstrate:

- integrated knowledge of various forms of economic development, including an understanding of regional economics and its application to local economic development;
- an understanding of various regional analysis techniques as well as the ability to demarcate and analyse regions using different scientific methods;
- the ability to identify, analyse and critically reflect on complex regional development problems and address these problems by applying evidence-based solutions and theory-driven arguments;
- the ability to identify alternative regional analysis techniques and to select and execute logical solutions and calculations;
- the ability to develop appropriate processes of information gathering within the context of regional development and analysis as well as the ability to independently validate the source of information, evaluate and manage the information; and
- the ability to develop and communicate ideas and opinions on regional development and analysis in well-formed arguments, using appropriate academic, professional, or occupational discourse.

Module uitkomst:

Ná suksessvolle voltooiing van die module behoort studente in staat te wees om:

- *geïntegreerde kennis te demonstreer van verskeie vorme van ekonomiese ontwikkeling, insluitend 'n begrip van streeksekonomie en die toepassing daarvan op plaaslike ekonomiese ontwikkeling;*
- *'n begrip van verskeie streekontledingstegnieke te demonstreer asook die vermoë om deur middel van verskillende wetenskaplike metodes streke af te baken en te analiseer;*
- *die vermoë te demonstreer om komplekse streekontwikkelingsprobleme te identifiseer, analiseer, krities daaroor te reflekteer en hierdie probleme aan te spreek, met toepassing van bewese oplossings en teorie-gedrewe argumente;*
- *die vermoë te demonstreer om alternatiewe streekontledingstegnieke te kan identifiseer en logiese oplossings en berekeninge te kan kies en uitvoer;*
- *die vermoë te demonstreer om gepaste inligtingversamelingstegnieke binne die konteks van streekontwikkeling en -ontleding toe te pas, asook die vermoë om onafhanklik die inligtingsbronne te valideer, evalueer en te bestuur; en*
- *die vermoë te demonstreer om idees en opinies oor streekontwikkeling en -ontleding deur middel van goed gestruktureerde argumente te ontwikkel en te kommunikeer deur gebruik te maak van gepaste akademiese, professionele, of beroepsgerigte diskoerse.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleentheid.

**Module code /
Modulekode: SBSS313**

Semester 1

**NQF level / NKR vlak: 7
Credits / Krediete: 16**

Title: Planning for sustainable cities / Titel: Beplanning vir volhoubare stede

Module outcomes:

On successful completion of this module, students should be able to:

- demonstrate integrated knowledge and logical understanding of theories, planning principles and approaches to plan sustainable cities;
- demonstrate coherent understanding of the different perspectives and complex problems relating to the interpretation of sustainable cities;
- demonstrate an advanced ability to analyse, evaluate and consider complex problems relating to the planning of sustainable cities, with sufficient evidence from theory and practice;
- demonstrate the ability to reflect on the values, ethical conduct and justifiability of decisions appropriate to the practice of city planning and broader sustainability thinking; and
- demonstrate an ability to develop and communicate own ideas and opinions in well-formed arguments, using appropriate academic, professional, or occupational discourse.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:

- *geïntegreerde kennis en logiese begrip te demonstree van teorieë, beplanningsbeginsels en benaderings vir die beplanning van volhoubare stede;*
- *samehangende begrip te demonstree van die verskillende perspektiewe en komplekse probleme met betrekking tot die interpretasie van volhoubare stede;*
- *'n gevorderde vermoë te demonstree om komplekse probleme met betrekking tot die beplanning van volhoubare stede te analiseer, evalueer en te oorweeg, met voldoende bewyse uit teorie en praktyk;*
- *die vermoë te demonstree om te besin oor die waardes, etiese optrede en regverdigbaarheid van besluite wat toepaslik is vir die praktyk van Stadsbeplanning en breër volhoubaarheidsdenke; en*
- *die vermoë te demonstree om eie idees en menings in goed gevormde argumente te ontwikkel en te kommunikeer, deur gebruik te maak van toepaslike akademiese, professionele of professionele diskoers.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleentheid.

Module code / Modulekode: SBES313	Semester 1	NQF level / NKR vlak: 7 Credits / Krediete: 16
Title: Infrastructure planning / Titel: Infrastruktuurbeplanning		
Module outcomes:		
On successful completion of this module, students should be able to:		
<ul style="list-style-type: none"> • comprise knowledge of the integrated work environment in which the planner operates and how it relates to current legislation, rules, theories, design concepts and the disciplines involved in the design and installation of engineering services and the application of other engineering aspects; • explain what engineering services and aspects involve in practice and evaluate what the possible impact thereof will be on the planning and design of a site and also on the long-term development of a region; • undertake the collection of prevailing norms, standards and design principles involved in engineering services and aspects and to validate and evaluate it in order to determine the impact thereof on the planning and design of a site in order to ensure the effective installation of engineering services and the application of other engineering aspects; • identify, analyse and critically reflect on potentially complex problems applicable to the design and installation of engineering services and aspects, when planning and designing a site, and be able to solve it within the context of prevailing norms, standards and design principles applicable and offered in legislation and professional practice; • illustrate the planning and design of a site in an ethical and accountable manner through appropriate drawing techniques and display awareness of what the decisions and ethical approach of the planner could be on the design and installation of engineering services and aspects on the future development of a site and of a region; and • illustrate the planning and design of a site, by applying prevailing norms, standards and design principles, in relation and context to the potential impact it may have on installation of engineering services and systems. 		
<i>Module uitkomst:</i>		
<i>Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:</i>		
<ul style="list-style-type: none"> • oor kennis te beskik rakende die geïntegreerde werksomgewing waarin die beplanner werksaam is en die wyse hoe dit verband hou met heersende wetgewing, reëls, teorieë, ontwerp konsepte en die dissiplines betrokke by die ontwerp en installering van ingenieursdienste en toepassing van ander ingenieursaspekte; • verduidelik wat ingenieursdienste en –aspekte in die praktyk behels en te evalueer wat die moontlike impak daarvan op die beplanning en ontwerp van 'n terrein en ook op die langtermyn ontwikkeling van 'n streek sal wees; • die versameling van heersende norme, standaarde en ontwerpbeginsels betrokke by ingenieursdienste en –aspekte te onderneem, dit te valideer en te evalueer ten einde te bepaal wat die impak hiervan op die beplanning en ontwerp van 'n terrein sal wees ten einde die effektiewe installering van ingenieursdienste en toepassing van ander ingenieursaspekte, te verseker; • moontlike komplekse probleme rakende die ontwerp en installering van ingenieursdienste en –aspekte, tydens die beplanning en ontwerp van 'n terrein, te identifiseer, analiseer, krities daaroor te reflekteer en dit op te los binne die konteks van heersende norme, standaarde en ontwerpbeginsels wat van toepassing is en voorgehou word in wetgewing en die professionele praktyk; • die beplanning en ontwerp van 'n terrein op eties en professionele wyse, deur toepaslike tekentegniese te kan illustreer, en bewustheid te toon van wat die besluite en etiese benadering van die beplanner op die ontwerp en installering van ingenieursdienste en –aspekte, op die toekomstige ontwikkeling van 'n terrein en 'n streek sal wees; 		

- die beplanning en ontwerp van 'n terrein, deur die toepassing van heersende norme, standaarde en ontwerpbeginsels, in verhouding en konteks tot die impak wat dit moontlik kan hê op die installering van ingenieursdienste en sisteme, te illustreer.

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleenthede.

Module code /

Modulekode: SBSS321

Semester 2

NQF level / NKR vlak: 7

Credits / Krediete: 16

Title: Transport planning and systems / Titel: Vervoerbeplanning en stelsels

Module outcomes:

On successful completion of this module, students should be able to:

- comprise integrated knowledge and be able to demonstrate an understanding of policy and legislation on regional, national and municipal contexts regarding transportation planning and the ability to correctly evaluated the relation it has with settlement and regional planning;
- explain knowledge and understanding of sustainable transport and the relation it has with the development of settlements in order to achieve optimal transportation planning in South Africa;
- identify, analyse and critically reflect on potentially complex transport problems arising from the interaction between settlement and transportation planning and solve it within the context of prevailing norms, standards and design principles applicable and proposed in relevant legislation and professional practice;
- undertake the collection of prevailing norms, standards and design principles involved in restructuring settlements and to validate and evaluate it in order to determine the impact thereof on the planning and design of transport supportive settlements; and
- illustrate the planning and design of settlements in an ethical and accountable manner through appropriate drawing techniques and display awareness of what the decisions and ethical approach of the planner could be on sustainable and public transport, land use and integration on the future development of settlements.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:

- oor geïntegreerde kennis te beskik en begrip te demonstreeer aangaande beleid en wetgewing op streek, nasionale en munisipale konteks rakende vervoerbeplanning en oor die vermoë beskik om die verband wat dit met nedersetting- en streek beplanning hou, korrek te evalueer;
- kennis en die begrip rakende volhoubare vervoer, en die verband wat dit op die ontwikkeling van nedersettings het, te verduidelik ten einde optimale vervoerbeplanning in Suid-Afrika te bereik;
- moontlike komplekse vervoerprobleme voortspruitend uit die interaksie tussen nedersetting- en vervoerbeplanning te identifiseer, analiseer, krities daaroor te reflekteer en dit op te los binne die konteks van heersende norme, standaarde en ontwerpbeginsels wat van toepassing is en voorgehou word in relevante wetgewing en die professionele praktyk;

- die versameling van heersende norme, standaarde en ontwerpbeginsels betrokke by die herstrukturering van nedersettings te onderneem, dit te valideer en te evalueer ten einde te bepaal wat die impak hiervan op die beplanning en ontwerp van vervoerondersteunende nedersettings is;
- die beplanning en ontwerp van nedersettings op eties en professionele wyse, deur toepasslike tekentegnieke en ontwerpbeginsels, te kan illustreer en bewustheid te toon van wat die besluite en etiese benadering van die beplanner op volhoubare en publieke vervoer, grondgebruik en integrasie op die toekomstige ontwikkeling van nedersettings sal wees.

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweeegde gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleenthede.

Module code /

Semester 2

NQF level / NKR vlak: 7

Modulekode: SECO321

Credits / Krediete: 16

Title: Urban ecology for Planners / Titel: Stedelike ekologie vir Beplanners

Module outcomes:

On successful completion of this module, students should be able to demonstrate:

- integrated knowledge and critical understanding of, as well as an ability to correctly evaluate and apply basic ecological principles, urban areas as unique ecosystems and the historical development of the discipline of urban ecology relevant to planning and design of urban areas;
- coherent understanding of the multiple sources of ecological knowledge (e.g. abiotic aspects such as climate, water, soil and biotic aspects such as producers, consumers and decomposers and the ecosystem services they provide) and to critically evaluate how this knowledge can be integrated in ecological planning and design;
- the ability to select, evaluate and apply different existing approaches and methods in ecological planning and design of urban areas addressing the issues of sustainability and resilience;
- the ability to analyse and evaluate academic literature to demarcate a researchable problem in ecological planning and design and specify an appropriate method that can be used to address the identified problem;
- the ability to identify, analyse and critically reflect on and address complex ecological issues in urban planning and design using arguments from current research with particular emphasis on the development of sustainable and resilient urban areas;
- accurate and coherent written and verbal communication with understanding of and respect for intellectual property conventions, copyright and rules on plagiarism; and
- the ability to reflect on the values, ethical conduct and justifiability of decisions appropriate to the practice of responsible urban ecological planning and design.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om die volgende te demonstreer:

- geïntegreerde kennis en kritiese begrip van, asook die vermoë om basiese ekologiese beginsels, stedelike gebiede as unieke ekosisteme en die historiese ontwikkeling van die dissipline van stedelike ekologie wat relevant is vir die beplanning en ontwerp van stedelike gebiede, korrek te evalueer en toe te pas;

- *samehangende begrip van die veelvuldige bronne van ekologiese kennis (bv. abiotiese aspekte soos klimaat, water, grond en biotiese aspekte soos produseerders, verbruikers en ontbinders en die ekosisteedienste wat hulle verrig) en om krities te evalueer hoe hierdie kennis in ekologiese beplanning en –ontwerp geïntegreer kan word;*
- *die vermoë om verskillende bestaande benaderings en metodes in ekologiese beplanning en –ontwerp te selekteer, evalueer en toe te pas, deur die vraagstukke van volhoubaarheid en veerkragtigheid aan te spreek;*
- *die vermoë om akademiese literatuur te analiseer en evalueer om 'n navorsingswaardige probleem in ekologiese beplanning en –ontwerp af te baken en om 'n geskikte metode wat gebruik kan word om die geïdentifiseerde probleem aan te spreek, te spesifiseer;*
- *die vermoë om komplekse ekologiese vraagstukke in stedelike beplanning en ontwerp te identifiseer, analiseer en krities daarop te reflekteer deur argumente vanuit huidige navorsing te gebruik met 'n spesifieke klem op die volhoubaarheid en veerkragtigheid van stedelike gebiede;*
- *akkurate en samehangende geskrewe en verbale kommunikasie met die begrip van en respek vir intellektuele eiendomsware, kopiereg en reëls met betrekking tot plagiaat; en die vermoë om op die waardes, etiese gedrag en verantwoordbaarheid van besluite wat geskik is vir die praktyk van verantwoordelike stedelike ekologiese beplanning en ontwerp, te reflekteer.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assesering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleentheid.

Module code /

Modulecode: SBSS323

Semester 2

NQF level / NKR vlak: 7

Credits / Krediete: 16

Title: Planning theory / Titel: Beplanningsteorie

Module outcomes:

On successful completion of this module, students should be able to demonstrate:

- an integrated knowledge and clear understanding of the difference between theories in, theories of and theories for planning; various theories of planning and the evolution of planning thought and the implication for planning practice;
- critically analyse and reflect upon the role of the planner and various stakeholders according to different theories of planning as well as how these theories shape plan-making;
- practical skill in terms of accessing and synthesising academic literature with regard to planning theory and presenting the literature in appropriate academic written and oral format whether individually or in a group; and
- ethical behaviour and a professional attitude with regard to the reading, writing, interpretation and presentation of planning theory.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:

- *geïntegreerde kennis en duidelike begrip te demonstree van die verkil tussen teorieë in, teorieë van en teorieë vir beplanning; verskeie teorieë van beplanning en die evolusie van beplanningsdenke en die implikasie daarvan vir beplanningpraktyk;*

- *krities te kan analiseer en reflekteer oor die rol van die beplanner en verskillende rolspelers volgens verskillende teorieë van beplanning sowel as hoe hierdie teorieë die ontwikkeling van planne vorm;*
- *praktiese vaardighede te demonstreeer in terme van die toegang en sintese van akademiese literatuur rakende beplanningsteorie asook die aanbied van die literatuur in gepaste akademiese geskrewe en mondelinge formaat hetsy individueel of in groepsverband; en*
- *etiese gedrag en 'n professionele houding te demonstreeer rakende die lees, skryf, interpretasie en aanbied van beplanningsteorie.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleentheid.

Module code /

Semester 2

NQF level / NKR vlak: 7

Modulekode: SRSK323

Credits / Krediete: 16

Title: Urban Risk Management / Titel: Stedelike Ramp Bestuur

Module outcomes:

On successful completion of this module, students should be able to:

- demonstrate integrated knowledge and logical understanding of , disaster risk management concepts and theories and how they relate to urban planning;
- demonstrate coherent understanding of natural hazards and underlying socio-economic drivers of disaster risk in urban areas;
- demonstrate the ability to reflect on and apply theoretical knowledge of disaster risk management to assess the level of urban disaster risk in case studies within developing world contexts;
- demonstrate an advanced ability to analyse, evaluate and consider the efficacy of theories and practices that aim reduce disaster risk and build resilient urban environments; and
- demonstrate an ability to develop and communicate own ideas and opinions in well-formed arguments, using appropriate academic, professional, or occupational discourse.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:

- *geïntegreerde kennis en logiese insig te demonstreeer van ramprisikobestuurskonsepte en -teorieë die die verband daarmee met stedelike beplanning;*
- *bewys te lewer van duidelike insig van natuurgevare en onderliggende sosio-ekonomiese stukragte van ramprisiko in stedelike gebiede;*
- *bewys te lewer van die vermoë om teoretiese kennis van ramprisikobestuur ter assessering van die vlak van stedelike ramprisiko in die konteks van 'n ontwikkelende wêreld, te bepeins en toe te pas;*
- *bewys te lewer van 'n gevorderde vermoë om die probaatheid van teorieë en praktyke wat op 'n verminderde vlak van stedelike ramprisiko gemik is, en om weerstandige stedelike omgewings te bou, te ontleed, evalueer en bedink; en*
- *bewys te lewer van 'n vermoë om eie idees en opinies in goedgeformuleerde argumente te ontwikkel en oor te dra deur die gebruik van geskikte akademiese, professionele of beroepsredevoering.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleenthede.

Module code / Modulekode: SGSS414	Semester 1	NQF level / NKR vlak: 8 Credits / Krediete: 16
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Title: Research methodology for Geo- and Spatial Sciences

Titel: Navorsingsmetodologie vir Geo- en Ruimtelike Wetenskappe

Module outcomes:

On successful completion of this module, students should be able to:

- demonstrate the ability to independently conduct research under guidance, and collect, process, analyse, evaluate and interpret information and data, and to document these findings meaningfully in a research proposal in the field of Geo- and Spatial Sciences;
- demonstrate integrated knowledge of and engagement in scientific research, and critical understanding and application of theories, research methodologies and techniques relevant to Geo- and Spatial research;
- demonstrate an ability to critically interrogate multiple sources of knowledge within the field of Geo- and Spatial Sciences, and critically evaluate and review the knowledge and the manner in which the knowledge was produced;
- demonstrate the ability to identify, analyse and effectively apply supervised research methods in order to reflect on and address complex or abstract problems in Geo- and Spatial Sciences; and
- demonstrate an ability to assume full responsibility for own research, learning, decision-making and use of resources, as well as writing of the research proposal and presentation thereof.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:

- *die vermoë te demonstree om selfstandig navorsing uit te voer onder toesig, inligting en data te versamel, te verwerk, te analiseer, te evalueer en te interpreteer en dit sinvol te dokumenteer in 'n navorsingsvoorstel in die veld van Geo- en Ruimtelike wetenskappe;*
- *geïntegreerde kennis van en deelname aan wetenskaplike navorsing te demonstree, asook kritiese begrip en toepassing van teorieë, navorsingsmetodes en -tegnieke wat relevant is vir Geo- en Ruimtelike navorsing;*
- *die vermoë te demonstree om verskeie bronne van kennis in die veld van Geo- en Ruimtelike navorsing te kan raadpleeg, en daardie kennis en die wyse van produksie van daardie kennis krities te evalueer;*
- *die vermoë te demonstree om navorsingsmetodes te identifiseer, analiseer en effektief toe te pas onder leiding van 'n studieleier, ten einde komplekse of abstrakte probleme in Geo- en Ruimtelike Wetenskap te oorweeg en aan te spreek; en*
- *die vermoë te demonstree om volle verantwoordelikheid te aanvaar vir eie navorsing, leer, besluitneming en gebruik van hulpbronne, as ook vir die skryf van die navorsingsartikel en aanbieding daarvan.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleentheid.

**Module code /
Modulekode: SBRS411**

Semester 1

**NQF level / NKR vlak: 8
Credits / Krediete: 16**

Title: Regional analysis and application / Titel: Streekanalise en toepassing

Module outcomes:

On successful completion of this module, students should be able to:

- demonstrate coherent understanding and integrated knowledge of the principles and ideas of national policy and legislation of regional planning and development;
- demonstrate an ability to critically interrogate the complexities in analysing and evaluating planning policy and planning instruments in the realisation of regional planning initiatives in South Africa;
- demonstrate the ability to critically review the contents of spatial development plans for all the spheres of authorities in order evaluate contexts, based on theoretical and practical foundations;
- demonstrate an advanced ability to interrogate and critically reflect on and effectively address complex issues related to (i) the role of different aspects of globalisation in contemporary urban environments, (ii) different forms of urban development patterns based on different development pulses on migration; (iii) factors that have impacts on migration patterns in developed and developing worlds;
- demonstrate an ability to develop and communicate own ideas and opinions in well-formed arguments, using appropriate academic, professional, or occupational discourse; and
- demonstrate the ability to reflect on the values, ethical conduct and justifiability of decisions appropriate to regional plans and policy.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:

- *samehangende begrip en geïntegreerde kennis van die beginsels en idees van nasionale beleid en wetgewing van streekbeplanning en ontwikkeling te demonstreer;*
- *die vermoë demonstreer om die kompleksiteit met betrekking tot die ontleding en evaluering van beplanningsbeleid en beplanningsinstrumente krities te ondersoek, in die verwesenliking van streeksbeplanning inisiatiewe in Suid-Afrika;*
- *die vermoë demonstreer om die inhoud van ruimtelike ontwikkelingsplanne krities te hersien vir alle sferes van owerhede ten einde kontekste te evalueer, gebaseer op teoretiese en praktiese grondslae;*
- *gevorderde vermoë te demonstreer en krities te reflekteer op en effektief komplekse vraagstukke rakende (i) die rol van verskillende aspekte van globalisering in kontemporêre stedelike omgewings te bespreek; (ii) verskillende vorme van stedelike ontwikkelingspatrone gebaseer op verskillende ontwikkelingspulsse oor migrasie; (iii) faktore wat 'n impak het op migrasiepatrone in ontwikkelde en ontwikkelende wêreldes;*
- *die vermoë demonstreer om eie ideë en menings in goed gevormde argumente te ontwikkel en te kommunikeer, deur toepaslike akademiese, professionele of beroepskommunikasie te gebruik; en*
- *die vermoë te demonstreer om te besin oor die waardes, etiese optrede en regverdigbaarheid van besluite wat geskik is vir streekplanne en -beleid.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the

student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleentheid.

**Module code /
Modulekode: SBSS412**

Semester 1

**NQF level / NKR vlak: 8
Credits / Krediete: 16**

Title: Integrated housing development / Titel: Geïntegreerde behuisingsontwikkeling

Module outcomes:

On successful completion of this module, students should be able to demonstrate:

- integrated understanding of the interface between housing and planning;
- critical insight into the complex and multi-dimensional nature of integrated housing development and how various paradigms, theoretical frameworks as well as policy and legislative frameworks shape housing practice in different contexts;
- critical thinking in order to evaluate various theoretical paradigms, theories, policies and acts and the progressive development of these in terms of the application of integrated housing development;
- advanced practical skills in terms of applying independent research in order to develop an integrated housing project for a specific context and presenting the project either in written, visual and oral format (or a combination of these) in a group; and
- the ability to develop criteria and judge the ethical and professional behaviour with regard to an integrated housing development project.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:

- *geïntegreerde begrip van die koppelvlakke tussen behuising en beplanning te demonstree;*
- *kritiese insig te toon in die komplekse en multi-dimensionele aard van geïntegreerde behuisingsontwikkeling en how verskillende paradigmas, teoretiese raamwerke sowel as beleid- en wetgewende raamwerke behuising praktyk vorm in verskeie kontekste;*
- *kritiese denke te demonstree ten einde verskeie teoretiese paradigmas, teorieë, beleide en wette en die progressiewe ontwikkeling van hierdie in terme van behuisingsontwikkeling te kan evalueer aan die hand van toegepaste voorbeelde;*
- *gevorderde praktiese vaardighede te toon in terme van die toepassing van onafhanklike navorsing ten einde 'n geïntegreerde behuisingsprojek vir 'n spesifieke konteks te kan ontwikkel en die projek in of geskrewe, visuele of mondelinge formaat (of 'n kombinasie hiervan) te kan aanbied in groepverband; en*
- *die vermoë demonstree om kriteria te ontwikkel om die etiese en professionele gedrag betreffende 'n geïntegreerde behuisingsontwikkelingsprojek te kan beoordeel.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleentheid.

Module code / Modulekode: SBSS414	Semester 1	NQF level / NKR vlak: 8 Credits / Krediete: 16
Title: Land use planning and development policy / Titel: Grondgebruikbeplanning en ontwikkelingsbeleid		
Module outcomes: On successful completion of this module, students should be able to: <ul style="list-style-type: none"> • demonstrate comprehensive knowledge of, and coherent understanding of theories, principles and processes of property development in South Africa; • demonstrate a relational understanding of the complexities of land markets and the generation of alternative development proposals; • demonstrate the ability to critically review spatial planning approaches in the evaluation of property development and land use management processes; • demonstrate an advanced skill to effectively analyse, synthesise and evaluate land use management systems in order to formulate a well-founded written and verbal opinion; . and (8d), offering creative insights, rigorous interpretations and solutions to issues appropriate to the context; and • demonstrate ethical behaviour and a professional attitude with regard to the writing, interpretation and presentation of land use management and property development. 		
Module uitkomst: Ná suksesvolle voltooiing van die module behoort studente in staat te wees om: <ul style="list-style-type: none"> • <i>in-diepte kennis en samehangende insig te demonstreeer rakende die teorieë, beginsels en prosesse van eiendomsontwikkeling in Suid-Afrika;</i> • <i>relasionele begrip te demonstreeer van die kompleksiteit van eiendomsmarkte en die daarstelling van alternatiewe ontwikkelingsvoorstelle;</i> • <i>die vaardigheid te demonstreeer om beplanningsbenaderings ten opsigte van eiendomsontwikkeling en grondgebruikbestuur krities te hersien;</i> • <i>gevorderde vaardigheid te demonstreeer om grondgebruikstelsels effektief te analiseer, sintetiseer en te evalueer ten einde goed gefundeerde skriftelike en mondelingse opinies weer te gee; en kreatiewe insigte, streng interpretasies en oplossings te bied vir aangeleenthede wat toepaslik is vir die konteks; en</i> • <i>etiese gedrag en professionele optrede met betrekking tot die daarstelling, interpretasie en voorstelling van grondgebruikstelsels en ontwikkelingsvoorstelle te demonstreeer.</i> 		
Method of delivery: Full-time Metode van aflewering: Voltyds		
Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities. Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleenthede.		
Module code / Modulekode: SBSS424	Semester 2	NQF level / NKR vlak: 8 Credits / Krediete: 16
Title: Strategic- and participatory planning / Titel: Strategiese- en deelnemende beplanning		
Module outcomes: On successful completion of this module, students should be able to demonstrate: <ul style="list-style-type: none"> • knowledge of and engagement in planning and professional practice by demonstrating an understanding of the requirements set by the professional body (SACPLAN) to the registered urban and regional planner, including the way in which this knowledge should be applied during community-based and participatory planning; 		

- an understanding of the complexities within the needs and aspirations of specific social and cultural groups in the context of urban and regional planning as well as an understanding of the social dimensions that must be taken into account during strategic planning processes;
- an understanding of the complexities of applying project planning and human resource management to community-based and participatory planning as a member of a multi-disciplinary team and also as a project leader;
- the ability to use strategic planning skills to identify, analyse and address complex and abstract problems in community-based and participatory planning by systematically making use of an appropriate strategic approach and relevant project management methods for urban and regional planning;
- the ability to identify and address ethical issues based on a critical reflection on the applicability of different ethical value systems within the context of community-based and participatory planning; and
- skills in gathering, critically evaluating, accurately interpreting and managing information regarding community-based and participatory planning, as well as to communicate creative recommendations and solutions to problems graphically, in report form and orally by making use of appropriate computer-aided software.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:

- *kennis van en betrokkenheid in die beplannings- en professionele praktyk te demonstreeer deur 'n begrip te toon van die vereistes wat deur die professionele liggaam (SACPLAN) aan die geregistreerde stads- en streekbeplanner gestel word met inbegrip van die wyse waarop hierdie kennis toegepas moet word tydens gemeenskapsgebaseerde- en deelnemende beplanning;*
- *'n begrip te demonstreeer van die kompleksiteit binne die behoeftes en aspirasies van spesifieke sosiale en kulturele groepe in die konteks van stads- en streekbeplanning asook 'n begrip van die sosiale dimensies wat in ag geneem moet word tydens strategiese beplanningsprosesse;*
- *'n begrip te demonstreeer van die kompleksiteit om as lid van 'n multi-dissiplinêre span en ook as projekteer, projekbeplanning en –menslike hulpbronsbestuur toe te pas op gemeenskapsgebaseerde- en deelnemende beplanning;*
- *die vermoë te demonstreeer om strategiese beplanningsvaardighede te gebruik om komplekse en abstrakte probleme in gemeenskapsgebaseerde- en deelnemende beplanning te identifiseer, te analiseer en aan te spreek deur sistematies gebruik te maak van 'n gepaste strategiese benadering en toepaslike projekbestuurmetodes vir stads- en streekbeplanning;*
- *die vermoë te demonstreeer om etiese sake en die toepaslikheid van verskillende etiese waardesisteme binne die konteks van gemeenskapsgebaseerde- en deelnemende beplanning te identifiseer en aan te spreek by wyse van kritiese refleksie; en*
- *vaardighede te demonstreeer om inligting rakende gemeenskapsgebaseerde- en deelnemende beplanning te versamel, krities te evalueer, akkuraat te interpreteer en te bestuur asook om kreatiewe voorstelle en probleemoplossings grafies, in verslagvorm en mondeling aan die hand van gepaste rekenaargesteunde sagteware te kommunikeer.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleenthede.

Module code / Modulekode: SSBP421	Semester 2	NQF level / NKR vlak: 8 Credits / Krediete: 16
Title: Planning practice / Titel: <i>Beplanningspraktyk</i>		
Module outcomes: On successful completion of this module, students should be able to: <ul style="list-style-type: none"> • function effectively in relation to other planners, the government and the public, within the context of planning legislation and the systems of ethical codes determined by the Council for Planners and the Planning Institute; • apply knowledge in professional practice relating to planning legislation and private law, liaising with other professions, the role and function of the government at national, provincial, district, local and traditional levels and to function effectively with other professions and these institutions; • understand the complexities in the practice of identifying legal procedures, analysing existing policies and development guidelines and consultation with stakeholders and the general public in order to propose cost effective procedures to clients at the submission of development applications; • collect and critically reflection on cadastral, legal and physical data relevant to development applications, criteria, norms, standards and design principles applicable in professional practice in order to propose creative, legally correct and cost effective procedures to clients; • through the application of specialised skills, analyse and address complex issues relating to the preliminary investigation, submission, assessment and approval of development applications within the context of current legislation, policies and development guidelines applicable in the professional practice; and • reflect on what the planner's decisions and ethical value systems will be on the design of a site and the subsequent submission of a development application and to address it within the context of prevailing design principles, policy, legislation and professional practice principles. 		
Module uitkomst: <p><i>Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:</i></p> <ul style="list-style-type: none"> • <i>binne die konteks van beplanningswetgewing en die sisteme van etiese kodes, bepaal deur die Raad vir Beplanners en die Beplanningsinstituut, effektief te funksioneer in verhouding met ander beplanners, die owerheid en die publiek;</i> • <i>kennis toe te pas in die professionele praktyk aangaande beplanningswetgewing en privaatreg, skakeling met ander professies, die rol en funksie van die owerheid op nasionale-, provinsiale-, distriks-, plaaslike- en tradisionele vlak en verantwoordelik met ander professies en hierdie instellings te skakel;</i> • <i>begrip te demonstreer van die kompleksiteit betrokke in die praktyk rakende die identifisering van wetlike prosedures, analisering van bestaande beleid en ontwikkelingsriglyne en konsultasie met belanghebbendes en die algemene publiek ten einde koste-effektiewe prosedures aan kliënte voor te stel by die loods van ontwikkelingsaansoeke;</i> • <i>die insameling van kadastrale-, wetlike- en fisiese data betrokke by ontwikkelingsaansoeke en kriteria, norme, standaarde en ontwerpbeginsels van toepassing in die professionele praktyk, krities te ondersoek ten einde kreatiewe, wetlik korrekte en koste-effektiewe prosedures aan kliënte voor te stel;</i> • <i>deur die toepassing van gespesialiseerde vaardighede, komplekse probleme by die voorafgaande ondersoek, indiening, assessering en goedkeuring van ontwikkelingsaansoeke te analiseer en aan te spreek binne die konteks van heersende wetgewing, beleid en ontwikkelingsriglyne wat van toepassing is in die professionele praktyk; en</i> 		

- *te reflekteer wat die besluite en etiese waardesisteme van die beplanner op die ontwerp van 'n terrein en daaropvolgende indiening van 'n ontwikkelingsaansoek sal wees en dit binne die konteks van heersende ontwerpbeginsels, beleid, wetgewing en professionele praktykbeginsels, aan te spreek.*

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweegde gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleenthede.

Module code /

Semester 1 & 2

NQF level / NKR vlak: 8

Modulekode: SBSS472

Credits / Krediete: 32

Title: Research project / *Titel: Navorsingsprojek*

Module outcomes:

On successful completion of this module, students should be able to:

- demonstrate the ability to independently conduct research under guidance, and collect, process, analyse, evaluate and interpret information and data, and to document these findings meaningfully in a research paper;
- demonstrate the ability to apply advanced subject-specific and integrated planning knowledge and skills in addressing Urban and Regional planning issues and in identifying, analysing and solving complex and abstract problems;
- demonstrate sufficient knowledge of related literature, mastery of appropriate techniques and analytical methods, and the ability to remain at the forefront of the latest policy and practices in Urban and Regional planning;
- demonstrate an ability to effectively present and communicate academic and professional planning recommendations to a range of audiences, in order to offer creative insights, as well as scientific interpretations and solutions to problems and issues appropriate to the Urban and Regional planning context; and
- demonstrate an ability to assume full responsibility for own research, learning, decision-making and use of resources, as well as writing of the research paper and presentation thereof.

Module uitkomst:

Ná suksesvolle voltooiing van die module behoort studente in staat te wees om:

- *die vermoë te demonstreer om selfstandig navorsing uit te voer onder toesig, inligting en data te versamel, te verwerk, te analiseer, te evalueer en te interpreteer en dit sinvol te dokumenteer in 'n navorsingartikel;*
- *die vermoë te demonstreer om gevorderde vakspesifieke en geïntegreerde beplanningskennis en -vaardighede toe te pas om Stads- en -Streekbeplanningsvraagstukke aan te spreek en om komplekse en abstrakte probleme te identifiseer, te ontleed en op te los;*
- *voldoende bekendheid te demonstreer met verbandhoudende literatuur, bemeestering van toepaslike en analitiese metodes en die vermoë om op die voorpunt te bly van die nuutste wetgewing en praktyke in Stads- en -Streekbeplanning;*
- *die vermoë te demonstreer om akademiese en professionele beplanningsvoorstelle effektief aan te bied en te kommunikeer aan 'n verskeidenheid gehore, ten einde kreatiewe insigte te bied, asook wetenskaplike interpretasies en oplossings vir probleme en kwessies wat toepaslik is in die Stads- en Streekbeplanningskonteks; en*

- die vermoë te demonstreer om volle verantwoordelikheid te aanvaar vir eie navorsing, leer, besluitneming en gebruik van hulpbronne, as ook vir die skryf van die navorsingsartikel en aanbidding daarvan.

Method of delivery: Full-time

Metode van aflewering: Voltyds

Assessment: The final module mark is the non-weighted average of the formal formative and the summative assessment marks. The average module mark has to be above 50% for the student to pass the module. Students need at least 40% in order to qualify for the summative assessment opportunities.

Assessering: Die finale modulepunt is die ongeweege gemiddeld van die formele formatiewe assesseringspunt en die summatiewe assesseringspunt. 'n Student benodig ten minste 50% vir die gemiddelde punt om die module te slaag. 'n Minimumpunt van 40% word benodig om te kwalifiseer vir die summatiewe assesseringsgeleenthede.

NAS.2.8.21 STATISTICS / STATISTIEK

Module code: STTN111	Semester 1	NQF Level: 5
Title / Titel: Descriptive Statistics / Beskrywende Statistiek		
Module outcomes / Module uitkomst:		
<p>A student who has completed this module should be able to demonstrate the following knowledge:</p> <p>Fundamental knowledge of the most important elementary statistical techniques used every day, such as sampling methods, determining sample size, graphical representation of data, descriptive measures of locality and scattering, least squares line fitting, predictions by means of least squares line fitting, correlation coefficients, time series data and movement components in order to predict future outcomes, practical considerations with regard to questionnaires and sampling sizes; fundamental knowledge of probabilities and probability distributions, the central limit theorem, for large sample sizes the estimation of population parameters by means of point and interval estimation, to demonstrate problem solving skills by solving familiar and unfamiliar problems; to implement the acquired knowledge to problems involving the above-mentioned skills and techniques. /</p> <p><i>'n Student wat hierdie module voltooi het behoort die volgende kennis te kan toon: Fundamentele kennis van die belangrikste elementêre statistiese tegnieke wat daaglik gebruik word, soos steekproefnemingsmetodes, bepaling van steekproefgroottes, grafiese voorstelling van data, beskrywende maatstawwe van lokaliteit en spreiding, kleinste kwadrate lynpassing, voorspellings deur middel van kleinste kwadrate lynpassing, die korrelasiekoëffisiënt, tydreëks dataanalise, bewegingskomponente om toekomstige uitkomstes te voorspel, praktiese oorwegings aangaande vraelyste en steekproefgroottes, fundamentele kennis van waarskynlikhede en waarskynlikheidsverdelings, die sentrale limietstelling, vir groot steekproewe die beraming van populasie parameters deur middel van punt- en intervalberaming, probleemoplossingsvaardighede deur bekende en onbekende probleme op te los, en om kennis wat opgedoen is aan te wend in toepassings rakende bogenoemde onderwerpe en tegnieke.</i></p>		
Module code: STTN115	Semester 1	NQF Level: 5
Title / Titel: Descriptive Statistics and Inference / Beskrywende Statistiek en Inferensie		
Module outcomes / Module uitkomst:		
<p>On completion of the module the learner should be able to:</p> <p>Demonstrate fundamental knowledge and understanding of the most important elementary statistical techniques that are used daily, such as sampling methods, graphical representation of data, descriptive measures of location and spread, least squares line fitting, prediction from least squares lines, the coefficient of correlation, multiple regression, time series data,</p>		

movement components to predict future outcomes, practical considerations regarding sample surveys and sample sizes. Also demonstrate knowledge and understanding of the normal and t probability distributions, the central limit theorem, estimation of population parameters by the use of point and interval estimation, hypothesis testing for population means and proportions for one and two samples (parametric and non-parametric).

Demonstrate skills to use statistical knowledge and techniques to solve known and unknown real world problems and to communicate methods, solutions and conclusions as an individual and/or part of a group, orally and in writing in an ethical, responsible and acceptable way.

'n Student wat hierdie module voltooi het behoort in staat te wees om :

Fundamentele kennis en begrip te demonstreeer van die belangrikste elementêre statistiese tegnieke wat daaglik gebruik word, soos steekproefneming metodes, grafiese voorstelling van data, beskrywende maatstawwe van lokaliteit en spreiding, kleinste kwadrate lynpassing, voorspellings deur middel van kleinste kwadrate lynpassing , die korrelasiekoëffisiënt, meervoudige regressie, tydreeks data, bewegingskomponente om toekomstige uitkomstes te voorspel, en praktiese oorwegings aangaande vraelyste en steekproefgroottes. Die student behoort ook kennis en begrip te demonstreeer van die normaal en t waarskynlikheidsverdelings, die sentrale limietstelling, beraming van populasie parameters deur middel van punt- en intervalberaming, hipotesetoetsing vir populasiegemiddeldes en –proporsies vir een en twee steekproewe (parametries en nie-parametries) .

Vaardighede te demonstreeer om statistiese kennis en tegnieke te gebruik om bekende en onbekende werklikheidsgetroue probleme op te los en metodes, oplossings en gevolgtrekkings as individu en/of as lid van 'n groep op eties, verantwoordelike en aanvaarbare wyse skriftelik en mondeling te kommunikeer

Module code: STTN121

Semester 2

NQF Level: 5

Title / Titel: Introductory Statistical Inference / Inleidende Statistiese Inferensie

Module outcomes / Module uitkomstes:

A student who has completed this module should be able to demonstrate the following: Fundamental knowledge of probabilities and probability distributions, the central limit theorem, estimation of population parameters by means of point and interval estimation, hypothesis testing for population averages and proportions for one and two samples, one way analysis of variance (ANOVA) and categorical data analysis, contingency tables and basic tests on categorical data; problem solving skills by analyzing familiar and unfamiliar problems, using acquired knowledge to solve simple probability problems, applying the knowledge gained above on data where applicable.

'n Student wat hierdie module voltooi het behoort die volgende kennis te kan toon:

Fundamentele kennis van waarskynlikhede en waarskynlikheidsverdelings, die sentrale limietstelling, beraming van populasie parameters deur middel van punt- en intervalberaming, hipotesetoetsing vir populasiegemiddeldes en –proporsies vir een en twee steekproewe, eenrigting variansieanalise (ANOVA) en kategoriese data analise, gebeurlikheidstabelle en basiese toetse op kategoriese data; probleemoplossingsvaardighede deur oplossing van bekende en onbekende probleme, om kennis wat opgedoen is te gebruik om eenvoudige probleme op te los rakende bostaande onderwerpe

Module code: STTN122	Semester 2	NQF Level: 5
Title / Titel: Introductory Statistics / Inleidende Statistiek		
Module outcomes / <i>Module uitkomst:</i>		
At the end of the module the student should demonstrate knowledge of the following concepts and the ability to apply it as described below:		
<ul style="list-style-type: none"> i. statistical techniques used everyday, for example sampling methods, graphical representation of data and descriptive measures of locality and scattering; ii. fitting linear regression curves to bivariate data and using the least squares method; iii. making simple predictions by using appropriate curves, as well as by interpreting the correlation coefficient; iv. handling time series data and calculating movement components in order to predict future outcomes; v. carrying out simple probability calculations and using probability distributions; vi. the central limit theorem and applying it to practical problems; vii. estimating population parameters by means of point and interval estimation; viii. hypothetical testing for population averages and population proportions in one or two sampling cases. ix. to identify the presence and applicability of the above statistical concepts in a practical situation, as well as to perform statistical methods using manual analysis or statistical software. 		
<i>Aan die einde van die module behoort die student kennis te dra van die volgende begrippe en in staat te wees om dit op basiese vlak te kan toepas:</i>		
<ul style="list-style-type: none"> i. <i>statistiese tegnieke wat daagliks gebruik word bv. steekproefmetodes, grafiese voorstelling van die data en beskrywende maatstawwe van lokaliteit en spreiding;</i> ii. <i>lineêre regressie krommes te pas op tweeveranderlike data en die kleinste kwadrate metode te kan gebruik;</i> iii. <i>eenvoudige voorspellings te maak met die gepaste kromme, asook die interpretasie van die korrelasiekoëffisiënt;</i> iv. <i>die hantering van tydreeksdata en die berekening van bewegingskomponente ten einde toekomstige uitkomstes te kan voorspel;</i> v. <i>die uitvoering van eenvoudige waarskynlikheidsberekeninge en die gebruik van waarskynlikheidsverdelings;</i> vi. <i>die sentrale limietstelling en die toepassing daarvan op praktiese probleme;</i> vii. <i>die beraming van populasieparameters m.b.v. punt- en intervalberaming;</i> viii. <i>hipotesetoetsing vir populasiegemiddeldes en populasieproporsies vir een en twee steekproef gevalle.</i> ix. <i>Die teenwoordigheid en toepasbaarheid van bostaande statistiese konsepte te kan herken in 'n praktiese situasie, asook die uitvoering van statistiese metodes deur gebruik te maak van ontleding per hand of d.m.v. statistiese sagteware.</i> 		
Module code: STTN124	Semester 2	NQF Level: 5
Title / Titel: Practical Statistics / Praktiese Statistiek		
Module outcomes / <i>Module uitkomst:</i>		
At the end of the module the student should be able to demonstrate knowledge of the following concepts and to apply them as described below		
<ul style="list-style-type: none"> i. correlation and its interpretation, the method of least squares fitting to a regression function, prediction by means of a regression function, multiple linear regression and selection of predictors; ii. basic factor analysis and the interpretation of its results, interpretation of factor matrices and construct validity; 		

- iii. the hypothesis testing procedure, probability calculations, the central limit theorem, level of significance and p values;
- iv. one-way ANOVA testing procedures, the interpretation of results;
- v. practical significance of effect sizes of differences in averages and proportions for one and two populations;
- vi. categorical data analysis by means of contingency tables, chi-squared tests and independence tests;
- vii. distribution-free methods: the difference between parametric and nonparametric methods of inference, as well as deciding which method to use in a specific situation.
- viii. to identify the presence and applicability of statistical concepts in a practical situation, as well as to perform statistical methods using manual analysis or statistical software.

Aan die einde van die module behoort die student kennis te dra van die volgende begrippe en in staat te wees om dit te kan toepas:

- (i) *korrelasie en die interpretasie daarvan, die metode van kleinste kwadrate, passing van 'n regressiefunksie, voorspelling m.b.v. 'n regressiefunksie, meervoudige lineêre regressie en die seleksie van voorspellers;*
- (ii) *basiese faktoranalise en die interpretasie van resultate daarvan, interpretasie van faktor matrikse en konstrugeldigheid;*
- (iii) *die hipotesetoetsingsprosedure, waarskynlikheidsberekeninge, die sentrale limietstelling, betekenispeil en p-waardes;*
- (iv) *een-rigting ANOVA toetsingsprosedures, die interpretasie van resultate;*
- (v) *praktiese betekenisvolheid van effekgroottes van verskille in gemiddeldes en proporsies vir een en twee populasies;*
- (vi) *kategorieëse data-analise m.b.v. gebeurlikheidstabelle, chi-kwadraat passingstoetse en toetse vir onafhanklikheid;*
- (vii) *verdelingsvrye metodes: die verskil tussen parametriese en nie-parametriese metodes van inferensie asook om te besluit welke metode om te gebruik in 'n bepaalde situasie.*
- (viii) *die teenwoordigheid en toepasbaarheid van bostaande statistiese konsepte te kan herken in 'n praktiese situasie, asook die uitvoering van statistiese metodes daarvan deur gebruik te maak van ontleding per hand of d.m.v. statistiese sagteware.*

Module code: STTN125

Semester 2

NQF Level: 5

Title / Titel: Introductory Probability Theory / Inleidende Waarskynlikheidsleer

Module outcomes / Module uitkomst:

On completion of the module the learner should be able to

- demonstrate knowledge and understanding of
 - concepts such as the sample space, events, probability measures, counting methods, random outcomes of events and the independence of events;
 - important probability theorems such as the law of total probability and the theorem of Bayes;
 - random variables, distribution functions and mass function, discrete random variables and the following distributions: binomial, geometric, negative binomial, hyper geometric, and Poisson as well as exponential, gamma and normal distributions and the functions of these variables;
 - one way analysis of variance (ANOVA) and apply it to practical problems with the use of computer output.
- demonstrate skills to use statistical knowledge and techniques to solve known and unknown real world problems and to communicate methods, solutions and conclusions

as an individual and/or part of a group, orally and in writing in an ethical, responsible and acceptable way.

Na voltooiing van die module behoort die student

- *kennis en begrip te demonstreer van*
 - *konsepte soos die uitkomsruimte, gebeurtenisse, waarskynlikheidsmate, telprosesse, stogastiese uitkomstes van gebeurtenisse en die onafhanklikheid van gebeurtenisse;*
 - *belangrike waarskynlikheidsleerstellings soos die wet van totale waarskynlikheid en die stelling van Bayes;*
 - *stogastiese veranderlikes, verdelingsfunksies en massafunksies, diskrete stogastiese veranderlikes en die volgende verdelings: binomiaal, geometries, negatief binomiaal, hipergeometries en Poisson sowel as die kontinue stogastiese veranderlikes tesame met hul verdelingsfunksies: eksponensieel, gamma en normaalverdelings en funksies van die veranderlikes;*
 - *Eenrigting variansie analise (ANOVA) en die toepassing hiervan op praktiese probleme mbv geskikte rekenaaruitvoer.*
- *vaardighede te demonstreer om statistiese kennis en tegnieke te gebruik om bekende en onbekende werklikheidsgetroue probleme op te los en metodes, oplossings en gevolgtrekkings as individu en/of as lid van 'n groep op eties, verantwoordelike en aanvaarbare wyse skriftelik en mondeling te kommunikeer*

Module code: STTN215	Semester 1	NQF Level: 6
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Title / Titel: Probability and Sampling Theory / Waarskynlikheidsleer en Steekproefteorie

Module outcomes / *Module uitkomstes:*

On completion of the module the student should be able to:

- demonstrate knowledge of:
 - the probability structure of two or more random variables as well as their joint distributions;
 - copulas and their properties;
 - conditional distributions and the application of probability calculations on conditional distributions;
 - order statistics and the application thereof;
 - the expected value and variance of all the important discrete and continuous random variables that were discussed in earlier work;
 - the covariance and correlation of two random variables, in addition to conditional expected values and moment generating functions;
 - two of the most important theorems of Probability theory, the so-called Law of Large Numbers and the Central Limit Theorem.
 - distributions derived from the normal distribution;
 - various sampling methods, such as simple random sampling and stratified sampling, and their properties.
- demonstrate problem solving skills by analysing problems that had been previously encountered and problems that are new and unfamiliar.
- use the computer language SAS (PROC IML) to apply these concepts practically.

Na voltooiing van die module behoort die student in staat te wees om:

- *kennis te toon van:*
 - *die waarskynlikheidsstruktuur van twee of meer stogastiese veranderlikes sowel as hul gesamentlike verdelings;*
 - *copulas en die eienskappe daarvan;*

- *voorwaardelike verdelings en die toepassing van waarskynlikheidsberekeninge op voorwaardelike verdelings;*
- *orde-statistieke en die toepassing daarvan;*
- *die verwagte waarde en variansie van belangrike diskrete en kontinue stogastiese veranderlikes wat in vorige werk behandel is;*
- *die kovariansie en korrelasie van twee stogastiese veranderlikes, sowel as voorwaardelike verwagte waardes en momentvoortbringende funksies;*
- *twee van die belangrikste stellings in Waarskynlikheidsleer, die sogenaamde Wet van Groot Getalle en die Sentrale Limietstelling;*
- *verdelings afgelei uit die normaalverdeling;*
- *verskeie steekproefnemingsmetodes, soos bv. eenvoudige ewekansige steekproefneming, asook die eienskappe van hierdie metodes;*
- *probleemoplossingstegnieke te demonstreer deur bekende en nuwe, onbekende probleme te ontleed;*
- *programmeringstale soos SAS (PROC IML) te kan gebruik om hierdie konsepte prakties toe te pas.*

Module code: STTN225

Semester 2

NQF Level: 6

Title / Titel: Statistical Inference and Data Analysis / Statistiese Inferensie en Data-analise

Module outcomes / *Module uitkomst:*

On completion of the module the student should be able to:

- demonstrate fundamental knowledge of the following statistical concepts: method of moments and the method of maximum likelihood to estimate parameters, efficiency of an estimator, sufficient statistics, the testing of hypotheses, the duality of confidence intervals and hypothesis testing, informal techniques for assessing goodness of fit, methods for summarizing data, measures of location and spread, density estimation, and the bootstrap.
- demonstrate problem solving skills by analysing familiar and unfamiliar problems, estimating parameters by means of the method of moments and maximum likelihood, determining if an estimator is efficient and finding sufficient statistics in a variety of problems.
- demonstrate the ability to construct complete and sufficient statistics, use the Neyman-Pearson paradigm to perform a hypothesis test, apply the connection between hypothesis testing and confidence intervals in the context of estimation, make conclusions using descriptive statistics, apply methods for summarizing data, calculate measures of location and spread, be able to use the bootstrap to (a) construct confidence intervals for a parameter and (b) estimate the variability of an estimator.
- apply these concepts to real-world data.
- use the computer language SAS (PROC IML) to apply these concepts practically.

Met afhandeling van hierdie module moet die student instaat wees om:

- *fundamentele kennis te demonstreer van die volgende statistiese konsepte: metode van momente en die metode van maksimum aanneemlikheid ten einde parameters te beraam, doeltreffendheid van 'n beramer, voldoende statistieke, hipotesetoetsing, die dualiteit tussen vertrouensintervalle en hipotesetoetsing, informele tegnieke vir pasgehaltetoetsing, metodes van data-opsomming, maatstawwe van lokaliteit en spreiding, digtheidsfunksieberaming, en die skoenlusmetode.*
- *probleemoplossing kundigheid ten toon te stel vir die analisering van bekende en onbekende probleme, parameters te beraam deur middel van die metode van maksimum aanneemlikheid en momente, bepaal welke 'n beramer doeltreffend is en voldoende statistieke te vind vir 'n verskeidenheid probleme.*

- kundigheid ten toon stel in die opstel van volledige envoldoende statistieke, gebruik van die Neyman-Pearson paradigma ten einde hipotesetoetsing uit te voer, toepassing van die verband tussen hipotesetoetsing en vertrouensintervalle in die konteks van beraming, gevolgtrekkings te maak deur beskrywende statistiek te gebruik, metodes van data-opsoemming toe te pas, berekening van maatstawwe van lokaliteit en spreiding, instaat te wees om die skoelusmetode toe te pas vir (a) die opstel van vertrouensintervalle vir parameters en (b) beraming van 'n beramer se variasie.
- bogenoemde konsepte toe te pas op data soos gevind in die praktyk.
- gebruik van die rekenaartaal SAS (PROC IML) om konsepte prakties toe te pas

Module code: STTN315

Semester 1

NQF Level: 7

Title / Titel: Statistical Inference and Time Series Analysis / Statistiese Inferensie en Tydreeksanalise

Module outcomes / *Module uitkomst:*

On completion of the module the student should be able to:

- demonstrate knowledge of:
 - inference concerning two independent samples (both parametric and non-parametric inference);
 - inference concerning two dependent or paired samples (both parametric and non-parametric inference) ;
 - the practical considerations of the experimental designs when conducting experiments with two independent or dependent samples;
 - the basic analyses and inferences applied to categorical data;
 - autoregressive (AR), moving average (MA), autoregressive moving average (ARMA) and autoregressive integrated moving average (ARIMA) time series models;
 - the process of identification, estimation and diagnosis of a time series;
 - forecasting techniques using simple extrapolation and moving average models as well as applying smoothing techniques;
 - the basic functionality of the computer package SAS (this includes reading in data sets, manipulating data sets, and the use of various SAS procedures to analyse data);
- demonstrate problem solving skills by analysing problems that had been previously encountered and problems that are new and unfamiliar.
- use the computer package SAS and R to apply all these concepts practically.

Na voltooiing van die module behoort die student in staat te wees om:

- kennis te toon van:
 - inferensie rakende twee onafhanklike steekproewe (beide parametries en nie-parametries);
 - inferensie rakende twee afhanklike steekproewe (beide parametries en nie-parametries);
 - die praktiese oorwegings by eksperimentele ontwerp;
 - die basiese analise en inferensie rakende kategoriese data;
 - outoregressiewe (AR), bewegende gemiddelde (MA), outoregressiewe bewegende gemiddelde (ARMA) en outoregressiewe integreerde bewegende gemiddelde (ARIMA) tydreeksmodelle;
 - die prosesse om tydreekse te identifiseer, te beraam en diagnostiese stappe te doen;
 - tegnieke om voor uit te skat deur gebruik te maak van eenvoudige ekstrapolasie en bewegende gemiddelde modelle;
 - die basiese funksionaliteit van die rekenaarpakket SAS;

- *probleemoplossingstegnieke te demonstreer deur bekende en nuwe, onbekende probleme te ontleed;*
- *programmeringstale soos SAS en R te kan gebruik om hierdie konsepte prakties toe te pas*

Module code: STTN316

Semester 1

NQF Level: 7

Title/Titel: Linear models I / Lineêre modelle I

Module outcomes:

On completion of the module, the student should be able to do the following:

- 1) Demonstrate integrated knowledge of linear statistical models including an understanding of, and an ability to apply, these models in theoretical and real-world settings.
- 2) Identify, analyse, critically reflect on and address complex statistical problems, applying theory driven arguments based on linear statistical models.
- 3) Problem solving skills by analysing problems that had been previously encountered and problems that are new and unfamiliar.

Module-uitkomst:

Met voltooiing van die module moet die student die volgende kan demonstreer:

- 1) *Geïntegreerde kennis van die toepassing van lineêre statistiese modelle insluitende begrip van, en 'n vermoë om, hulle toe te pas in teoretiese en werklikewereld scenarios.*
- 2) *Die vermoë om komplekse statistiese probleme te identifiseer, te analiseer, krities daaroor te reflekteer en aan te spreek, met toepassing van teoriegedrewe argumente gebaseer op lineêre statistiese modelle.*
- 3) *Probleemoplossingstegnieke deur bekende en nuwe, onbekende probleme te ontleed.*

Module code: STTN317

Semester 1

NQF Level: 7

Title/Titel: Statistical software and applications I / Statistiese sagteware en toepassings I

Module outcomes:

On completion of the module, the student should be able to demonstrate:

- 1) Integrated knowledge of the application of statistical software to conduct various statistical analyses.
- 2) Problem solving skills by analysing problems that had been previously encountered and problems that are new and unfamiliar.
- 3) An ability to communicate his or her statistical results and conclusions in a well-formed argument using appropriate academic and professional language.

Module-uitkomst:

Met voltooiing van die module moet die student die volgende kan demonstreer:

- 1) *Geïntegreerde kennis van die toepassing van statistiese sagteware om verskillende statistiese ontledings uit te voer.*
- 2) *Probleemoplossingstegnieke deur bekende en nuwe, onbekende probleme te ontleed;*
- 3) *Die vermoë om sy of haar statistiese resultate en gevolgtrekkings in 'n goed gevormde argument te kommunikeer deur gebruik te maak van toepaslike akademiese en professionele taal.*

Module code : STTN326

Semester 2

NQF Level: 7

Title/Titel: Analysis of dependent data / Analise van afhanklike data

Module outcomes:

On completion of the module, the student should be able to demonstrate:

- 1) *Integrated knowledge of time series models and critical understanding and application of these models.*
- 2) *Integrated knowledge of copulas and critical understanding and application of copulas.*

- 3) *The ability to select, apply, and critically judge the effectiveness of the implementation of relevant time series models and various types of copulas.*

Module-uitkomst:

Na voltooiing van die module behoort die student die volgende te kan demonstreeer:

- 1) *Geïntegreerde kennis van tydreeksmodelle en 'n kritiese begrip en toepassing van hierdie modelle.*
- 2) *Geïntegreerde kennis van copulas en 'n kritiese begrip en toepassing van copulas.*
- 3) *Die vermoë om krities die doeltreffendheid van die implementering van toepaslike tydreeksmodelle en verskeie soorte copulas te beoordeel.*

Module code: STTN327

Semester 2

NQF Level: 7

Title / Titel: Statistical software and applications II / Statistiese sagteware en toepassings II

Module outcomes:

On completion of the module, the student should be able to demonstrate:

- 1) *Integrated knowledge of the application of statistical software to conduct various statistical analyses.*
- 2) *Problem solving skills by analysing problems that had been previously encountered and problems that are new and unfamiliar.*
- 3) *An ability to communicate his or her statistical results and conclusions in a well-formed argument using appropriate academic and professional language.*

Module-uitkomst:

Met voltooiing van die module moet die student die volgende kan demonstreeer:

- 1) *Geïntegreerde kennis van die toepassing van statistiese sagteware om verskillende statistiese ontledings uit te voer.*
- 2) *Probleemoplossingstegnieke deur bekende en nuwe, onbekende probleme te ontleed;*
- 3) *Die vermoë om sy of haar statistiese resultate en gevolgtrekkings in 'n goed gevormde argument te kommunikeer deur gebruik te maak van toepaslike akademiese en professionele taal.*

Module code: STTK241

Semester 1

NQF Level: 6

Title / Titel: Statistics for Life Sciences' / Statistiek vir Lewenswetenskappe'

Module outcomes / Module uitkomst:

On completion of the module the learner should be able to:

- *Demonstrate knowledge and the ability to effectively apply the following:*
 - *the most important statistical techniques that are used daily, such as sampling methods, graphical representation of data, descriptive measures of location and spread;*
 - *linear regression curves to bivariate data using the least squares technique;*
 - *simple predictions by means of the fitted curve, and interpretation of the coefficient of correlation;*
 - *time series data and the calculation of the movement components to predict future outcomes;*
 - *simple probability calculations and probability distributions;*
 - *the central limit theorem and the application of the theorem to practical problems;*
 - *estimating population parameters by using point and interval estimation;*
 - *hypothesis testing for population means and population proportions for one and two samples;*
 - *one way and two way ANOVA;*

- chi squared test for independence; and
- principle component analysis.
- Recognise the presence and applicability of statistical concepts in a practical situation and perform statistical methods to summarise, understand and analyse data sets by using statistical computer software.
- Identify the appropriate statistical technique applicable to the problem presented.

Aan die einde van die module behoort die student:

- *Kennis te dra van die volgende begrippe en in staat te wees om die volgende toe te pas:*
 - *statistiese tegnieke wat daagliks gebruik word bv. steekproefmetodes, grafiese voorstelling van die data en beskrywende maatstawwe van lokaliteit en spreiding;*
 - *lineêre regressie krommes te pas op tweeveranderlike data en die kleinste kwadrate metode te kan gebruik;*
 - *eenvoudige voorspellings te maak met die gepaste kromme, asook die interpretasie van die korrelasiekoëffisiënt;*
 - *die hantering van tydreeksdata en die berekening van bewegingskomponente ten einde toekomstige uitkomstes te kan voorspel;*
 - *die uitvoering van eenvoudige waarskynlikheidsberekeninge en die gebruik van waarskynlikheidsverdelings;*
 - *die sentrale limietstelling en die toepassing daarvan op praktiese probleme;*
 - *die beraming van populasieparameters m.b.v. punt- en intervalberaming;*
 - *hipotesetoetsing vir populasiegemiddeldes en populasieproporsies vir een en twee steekproef gevalle;*
 - *Eenrigting- en tweerigting ANOVA;*
 - *Chi-kwadraat toets vir onafhanklikheid; en*
 - *Hoofkomponentontleding.*
- *Die toepaslikheid van bostaande statistiese konsepte in 'n praktiese omgewing te erken en statistiese metodes daarop kan toepas om datastelle op te som, te verstaan en te ontleed d.m.v. statistiese rekenaarsagteware.*
- *Die statistiese tegniek te kan identifiseer wat toepaslik is vir 'n bepaalde probleem.*

NAS.2.8.22 APPLIED MATHEMATICS / TOEGEPASTE WISKUNDE

Module code: APPM121(=TGWN121)	Semester 2	NQF Level: 5
Title / Titel: Statics and Mathematical Modelling / Statika en Wiskundige Modelling		
Module outcomes / Module uitkomstes:		
<p>On completing this module, the students should be able to do the following: demonstrate fundamental knowledge of geometric vectors and their operational rules, vectors, forces, components, scalar and vector product, Cartesian forms, resultant of two- and three-dimensional systems of force through a point, the principle of transmissibility, moments, couples, reduction of systems of forces to a single force and a single couple, equilibrium in a plane and equilibrium in space, friction and moments rotating about axes, the modelling process, geometric similarity and proportionalities, dimensional analysis and the theorem of Buckingham; to demonstrate problem solving skills by analysing familiar and unfamiliar problems, by using knowledge of techniques to determine resultants of different types of systems of force, by solving equilibrium problems in two and three dimensions, by forming and solving models by means of proportionality relations and dimensional analysis, by fitting models to data and by solving simple differential equations.</p>		
<p><i>Na voltooiing van hierdie module behoort die studente die volgende te kan doen: fundamentele kennis demonstreer van meetkundige vektore en hul bewerkingsreëls, vektore, kragte,</i></p>		

komponente, skalaar- en vektorproduk, Cartesiese vorms, resultant van 2 en 3-dimensionele kragtestelsels deur 'n punt, die beginsel van voortplaasbaarheid, momente, koppels, herleiding van stelsels kragte na 'n enkele krag en 'n enkele koppel, ewewig in die platvlak en ewewig in die ruimte, wrywing en momente om asse, die modelleringsproses, meetkundige soortgelykheid en eweredighede, dimensionele analise en die stelling van Buckingham; probleemoplossingsvaardighede demonstreer deur bekende en onbekende probleme te analiseer, kennis van tegnieke gebruik om resultante van verskillende tipes kragtestelsels te bepaal, ewewigsprobleme in 2 en 3-dimensies oplos, modelle met eweredigheidsverbande en deur dimensionele analise te vorm en op te los en modelle by data te pas

Module code: APPM122

Semester 2

NQF Level: 5

Title / Titel: Mathematical Modelling and Vector Algebra / Wiskundige Modellingering en Vektoralgebra

Module outcomes / Module uitkomst:

On completing this module, students should be able to do the following: demonstrate fundamental knowledge of the steps in the mathematical modelling process, geometric similarity, proportionalities, interpolation and fitting of a curve to data by means of least squares, the die L_1 norm and the Tsjebisjef norm, dimensional analysis, the theorem of Buckingham, differential equations, separable differential equations, initial conditions, modelling of growth processes, including Malthus and logistic growth, cooling problems, mixing problems and chemical reactions, geometric vectors, operations with them and use of them, and applications of them to forces and equilibrium problems; demonstrate problem solving skills by analysing familiar and unfamiliar problems, using knowledge of techniques to build mathematical models, solve separable differential equations, fit models to data, modelling by means of dimensional analysis; building models using separable differential equations and modelling and solving geometrical and statics problems by means of vectors.

Na voltooiing van hierdie module behoort die studente die volgende te kan doen: fundamentele kennis demonstreer van die stappe in die wiskundige modelleringsproses, meetkundige soortgelykheid, eweredighede, interpolasie en passing van 'n kromme by data deur kleinste kwadrate, die L_1 -norm en die Tsjebisjef-norm, dimensionele analise, Buckingham se stelling, differensiaalvergelykings, skeibare differensiaalvergelykings, aanvangsvoorwaardes, modellering van groei-prosesse insluitend Malthus en logistiese groei, afkoelingsprobleme, mengprobleme en chemiese reaksies, meetkundige vektore, bewerkings daarop en gebruik daarvan en toepassings daarvan op kragte en ewewigsprobleme; probleemoplossingsvaardighede demonstreer deur bekende en onbekende probleme te analiseer, kennis van tegnieke gebruik om wiskundige modelle te bou, skeibare differensiaalvergelykings op te los, modelle te pas by data, dimensionele analise te gebruik vir modellering, modelle te bou met skeibare differensiaalvergelykings en meetkundige en statika-probleme met vektore te modelleer en op te los

Module code: APPM211 (TGWN211)

Semester 1

NQF Level: 6

Title / Titel: Dynamics I / Dinamika I

Module outcomes:

On completion of this module, students should be able to do the following:

- Demonstrate fundamental knowledge of kinematics and kinetics of a single particle, a system of particles and a rigid body, all moving along a straight line or a curved trajectory.
- Demonstrate problem solving skills by analysing familiar and unfamiliar problems and using knowledge of kinematics and kinetics to calculate time duration, displacements, velocities, accelerations, forces, work done, energy, momentum, impulse, moment of inertia, angular impulse and angular momentum.

Module uitkomstes:

Na voltooiing van hierdie module behoort die studente die volgende te kan doen:

- Fundamentele kennis demonstreer van die kinematika en kinetika van 'n enkel deeltjie, 'n stelsel deeltjies en 'n starre liggaam vir reglynige en kromlynige beweging.
- Probleemoplossingsvaardighede demonstreer deur bekende en onbekende probleme te analiseer en kennis van kinematika en kinetika te gebruik om tydsvloer, verplasing, snelhede, versnellings, kragte, arbeid verrig, energie, momentum, impuls, traagheidsmoment, hoekimpuls en hoekmomentum te bereken.

Module code: APPM212
(=TGWN213 includes part of APMM217)

Semester 1

NQF Level: 6

Title / Titel: Differential Equations / *Differensiaalvergelyking*

On completion of this module, the student will demonstrate a thorough and advanced knowledge of, and skill in

- the underlying principles,
- the methods, and
- the application of the theory regarding selected aspects of the following topics:
 - Solution methods for separable, linear, Bernoulli, homogenous, and exact first order differential equations ;
 - Euler's method for approximating the solution of a differential equation;
 - Solution of homogenous linear second order differential equations with constant coefficients;
 - Solution of linear second order differential equations using the methods of undetermined coefficients and of variation of parameters;
 - Laplace transforms and inverse Laplace transforms;
 - Solution of first and second order initial value differential equations using Laplace transforms of continuous and discontinuous functions;
- Elementary modelling of practical problems using differential equations.

Module uitkomstes

Na voltooiing van die module, sal die student 'n deeglike en geordende kennis van, en vaardigheid in

- *die onderliggende beginsels,*
- *die metodes, en*
- *die toepassings van die teorie rakende geselekteerde aspekte van die volgende onderwerpe demonstreer:*
 - *Oplossingstegnieke vir lineêre, Bernoulli, skeibare, homogene en eksakte eerste orde differensiaalvergelykings;*
 - *Euler se metode om 'n differensiaalvergelyking se oplossing te benader;*
 - *Oplossing van tweede orde lineêre homogene differensiaalvergelykings met konstante koëffisiënte;*
 - *Oplossing van tweede orde differensiaalvergelykings met behulp van die metodes van onbepaalde koëffisiënte, en van variasie van parameters;*

- *Laplace transforms en inverse Laplace transforms;*
- *Oplossing van eerste en tweede orde differensiaalvergelykings met behulp van Laplace transforms vir kontinue en diskontinue funksies;*
- *Elementêre modellering van praktiese probleme met behulp van differensiaalvergelykings.*

Module code: APPM213 (formerly part of APMM227)	Semester 1	NQF Level: 6
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Title / Titel: Linear Programming		
Module outcomes / <i>Module uitkomst:</i> On completion of this module, the student will demonstrate a thorough and advanced knowledge of, and skill in <ul style="list-style-type: none"> • the understanding of linear programming. In particular regarding the topics of Simplex Algorithm; Duality Problems; Sensitivity Analysis; Revised Simplex Algorithm; Integer Programming; Transportation Programming; Dynamic Programming. • The identification of problems and the application of linear programming to solve these problems. • The interpretation of results and ability to communicate principles of linear programming to relevant stake holders. 		

Module code: APPM221 =TGWN221	Semester 2	NQF Level: 6
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Title / Titel: Dynamics II / Dinamika II		
Module outcomes / <i>Module uitkomst:</i> On completing this module students should be able to do the following: demonstrate fundamental knowledge of the theory of flexible cables, internal forces and deformation of simple beams, kinetics of rigid bodies and the motion of satellites and planets; demonstrate problem solving skills by solving familiar and unfamiliar problems involving deformations in beams and cables and motion of rigid bodies acted on by forces, and determining the orbits and positions of satellites. <i>Na voltooiing van hierdie module behoort die studente die volgende te kan doen: fundamentele kennis demonstreer van die teorie van buigbare kables, inwendige kragte en vervorming van eenvoudige balke, kinetika van starre liggame en die beweging van satelliete en planete; probleemoplossingsvaardighede demonstreer deur bekende en onbekende probleme oor die vervormings in balke en kables en beweging van starre liggame onder werking van kragte, sowel as bepaling van bane en posisies van satelliete te doen.</i>		

Module code: APPM222 (=TGWN223, includes part of APMM217)	Semester 2	NQF Level: 6
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Title / Titel: Numerical Methods / Numeriese Metodes		
Module outcomes / <i>Module uitkomst:</i> On completion of this module, the student will demonstrate a thorough and advanced knowledge of, and skill in <ul style="list-style-type: none"> • the underlying principles, • the methods, • the application of the theory, and • the proper use of computer algebra systems (such as MATLAB) 		

regarding selected aspects of the following topics:

Solution of non-linear equations:

- Bisection method
- Regula Falsi method
- Newton's method (single equations)
- Secant method
- Newton's method (systems of non-linear equations)

Interpolation and polynomial approximation:

- Lagrange interpolation
- Newton divided difference interpolation
- Linear and Cubic splines

Numerical integration and differentiation:

- Trapezium method
- Simpson' method
- Romberg's method
- Gauss-quadrature

Numerical solution of initial value differential equations:

- Euler's method
- Taylor's first order and second order method
- Runge-Kutta methods

Na voltooiing van die module, sal die student 'n deeglike en geordende kennis van, en vaardigheid in

- *die onderliggende beginsels,*
- *die metodes,*
- *die toepassings van die teorie, en*
- *die behoorlike gebruik van rekenaar-algebra stelsels (soos MATLAB).*

rakende geselekteerde aspekte van die volgende onderwerpe demonstreer:

Oplossings van nie-lineêre vergelykings:

- *Halveer metode*
- *Regula Falsi metode*
- *Newton se metode (enkel vergelykings)*
- *Sekant (snylyn) metode*
- *Newton se metode (stelsels nie-lineêre vegelykings).*

Interpolasie en polinoom benadering.

- *Lagrange interpolasie*
- *Newton se gedeelde differensie interpolasie*
- *Lineêre en kubiese latfunksies.*

Numeriese integrasie en differensiasie:

- *Trapesium metode*
- *Simpson se metode*
- *Romberg se metode*

- *Gauss-kwadratuurreeël*

Numeriese oplossing van aanvangswaarde differensiaalvergelykings .

- *Euler se metode*
- *Taylor se eerste orde en tweede orde metode*
- *Runge-Kutta metodes.*

Module code: APPM223 (formerly part of APMM227)

Semester 2

NQF Level: 6

Title / *Titel*: Mathematical Methods

Module outcomes / *Module uitkomst*:

On completion of this module, the student will demonstrate a thorough and advanced knowledge of, and skill in

- the understanding of mathematical methods. In particular as regards systems of linear ordinary differential equations, Riccati's equation, Clairaut's and Lagrange's equation, envelopes, reduction of order, equations of the form $Pdx+Qdy+Rdz=0$, $dx/P=dy/Q=dz/R$, first-order partial differential equations, characteristics.
- The identification of problems and the application of mathematical methods to solve the problems.
- The interpretation of results and ability to communicate the principles of this module to relevant stake holders.

Module code: TGWN311

Semester 1

NQF Level: 7

Title / *Titel*: **Partial Differential Equations / *Parsiële Differensiaalvergelykings***

Module outcomes / *Module uitkomst*:

On completing this module the student should be able to do the following: demonstrate fundamental knowledge of real-life problems where the mathematical model led to partial differential equations and the analytical solving of partial differential equations such as the wave, heat and potential equation and the electric charge problem, Fourier series, orthogonal functions and polynomial methods and the Sturm-Liouville problem; demonstrate problem solving skills by analysing familiar and unfamiliar problems, applying knowledge of techniques that are used to solve differential equations with methods using power series, to determine Fourier series and chandelling standard problems with the Fourier method.

Na voltooiing van hierdie module behoort die studente die volgende te kan doen: fundamentele kennis demonstreer van werklikheidsprobleme waarin die wiskundige model lei tot partiële differensiaalvergelykings en die analitiese oplos van partiële differensiaalvergelykings soos die golf-, warmte- en potensiaalvergelyking en die elektriese-lading-probleem; Fourier-reekse, ortogonale funksies en magreeksmetodes en die Sturm-Liouville-probleem; probleemoplossingsvaardighede demonstreer deur bekende en onbekende probleme te analiseer, kennis van tegnieke gebruik om differensiaalvergelykings met magreeksmetodes op te los, Fourier-reekse te bepaal en standaardprobleme met die Fourier-metode te hanteer

Module code: TGWN312

Semester 1

NQF Level: 7

Title / *Titel*: **Partial Differential Equations (Numerical) / *Parsiële Differensiaalvergelykings (numeries)***

Module outcomes / *Module uitkomst*:

On completing this module the student should be able to do the following: demonstrate fundamental knowledge and insight into the discretisation of ordinary and partial linear

differential equations, the special properties of tridiagonal matrices, calculation problems caused by ill-conditioned and sparse systems of linear equations, convergence properties of iterative methods of systems of linear equations and stability properties of numerical methods, solving parabolic, elliptical and hyperbolic differential equations numerically, performing iterative methods with MATLAB on a computer; demonstrate problem solving skills in numerically solving, by means of finite difference methods, two point boundary value problems, the heat equation, the potential equation and the wave equation with the finite difference methods and in implementing these by computer; show a fondness of this field of study and demonstrate insight into the relation between reality and abstraction, model and solution; reveal a Christian or alternative perspective on the subject.

Na voltooiing van hierdie module behoort die student die volgende te kan doen: fundamentele kennis en insig demonstreer in die diskretisering van gewone en partiële lineêre differensiaalvergelykings, spesiale eienskappe van tridiagonale matrikse-, berekeningsprobleme wat sleggeaardheid en yl stelsels lineêre vergelykings meebring, konvergensie-eienskappe van iteratiewe metodes vir stelsels lineêre vergelykings en die stabiliteitseienskappe van numeriese metodes, die numeriese oplossing van paraboliese, elliptiese en hiperboliese differensiaalvergelykings, en die uitvoering van iteratiewe metodes per rekenaar met MATLAB; probleemoplossingsvaardighede demonstreer in die numeriese oplos, deur middel van eindige-verskille-metodes, van tweepuntrandwaardeprobleme, die warmtevergelyking, die potensiaalvergelyking en die golfvergelyking en die rekenaarimplementering daarvan; 'n liefde vir die studieveld openbaar en begrip te toon vir die verband tussen werklikheid, abstraksie, model en oplossing; en ook 'n Christelike, of alternatiewe, perspektief op die vakgebied te hê.

Module code: TGWN321(not applicable to 2019 replaced by TGWN323)	Semester 2	NQF Level: 7
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Title / Titel: Dynamics III / Dinamika III

Module outcome / Module uitkomst:

On completing this module the student should be able to do the following: demonstrate fundamental knowledge and insight into the kinematics and kinetics of a rigid body in space, the Lagrange formulation for dynamics and the basis of variation calculus; demonstrate skills in solving problems describing motion and the constraints on motion, modelling the three-dimensional motion of a rigid body, stationary curves for functionals formed by integrals.

Na voltooiing van hierdie module behoort die student die volgende te kan doen: fundamentele kennis en insig demonstreer oor die kinematika en kinetika van 'n starre liggaam in die ruimte, die Lagrange-formulering van dinamika en die basis van variasierekene; probleemoplossingsvaardighede demonstreer in die oplos van probleme oor die beskrywing van beweging en beperkings op die beweging, modellering van die drie-dimensionele beweging van 'n starre liggaam, stasionêre krommes vir funksionale gevorm deur integrale; 'n liefde vir die studieveld openbaar en begrip te toon vir die verband tussen werklikheid, abstraksie, model en oplossing; en ook 'n Christelike, of alternatiewe, perspektief op die vakgebied te hê.

Module code: TGWN322	Semester 2	NQF Level: 7
Title / Titel: Optimisation / Optimalisering		
Module outcomes / <i>Module uitkomst:</i> On completing this module, students should be able to do the following: demonstrate fundamental knowledge of analytical and numerical optimisation techniques for functions of one or more variables, including problems with restrictions on unevenness and evenness; demonstrate problem solving skills by applying a variety of mathematical optimisation techniques to familiar and unfamiliar unrestricted and restricted problems and implementing these techniques by computer with MATLAB as computer language.		
<i>Na voltooiing van hierdie module behoort die studente die volgende te kan doen: fundamentele kennis demonstreer van analitiese en numeriese optimaliseringstegnieke, vir funksies van een of meer veranderlikes, insluitend probleme met ongelykheid- en gelykheidsbeperkings; probleemoplossingsvaardighede demonstreer deur vir bekende en onbekende, onbeperkte en beperkte probleme 'n verskeidenheid wiskundige optimaliseringstegnieke toe te pas en rekenaarmatig te implementeer, met MATLAB as rekenaartaal</i>		
Module code: TGWN323	Semester 2	NQF Level: 7
Title / Titel: Dynamical Systems / Dinamiese Stelsels		
Module outcomes / <i>Module uitkomst:</i> On completion of this, the student will demonstrate a thorough and advanced knowledge of, and skill in		
<ul style="list-style-type: none"> • the underlying principles, • the methods, and • the application of the theory regarding selected aspects of one or more of the following topics: 		
Linear and non-linear systems for both discrete and continuous time. In particular Markov chains (linear systems); fixed points, linearization, Lyapunov functions, periodicity, chaos and bifurcations (non-linear systems); the elementary theory of fractals.		
<i>Na voltooiing van die module, sal die student 'n deeglike en geordende kennis van, en vaardigheid in</i>		
<ul style="list-style-type: none"> • die onderliggende beginsels, • die metodes, en • die toepassings van die teorie 		
<i>rakende geselekteerde aspekte van die volgende onderwerpe demonstreer:</i> <i>Lineêre en nie-lineêre stelsels vir beide diskrete en kontinue tyd . Spesifiek Markov kettings (lineêre stelsels); dekpunte, linearisering, Lyapunov funksies, periodisiteit, chaos and bifurkasies (nie-lineêre stelsels); die elementere teorie van fraktale.</i>		

NAS.2.8.23 MATHEMATICS / WISKUNDE

Module code: MTHS111 (WISN111)	Semester 1	NQF Level: 5
Title / Titel: Introductory Algebra and Analysis I / Inleidende Algebra en Analise I		
Module outcome / <i>Module uitkomst:</i> On completion of this module, the student will demonstrate a thorough and advanced knowledge of, and skill in		
<ul style="list-style-type: none"> • the underlying principles, • the methods, and • the application of the theory 		

regarding selected aspects of the following topics:

- fundamental knowledge of the system of natural numbers including mathematical induction, integer numbers including the Euclidean algorithm and their applications, rational numbers, irrational numbers, real numbers and complex numbers including De Moivre's theorem and its applications, the concept of functions, absolute value functions, circle measure and trigonometric functions, inverse functions and inverse trigonometric functions, polynomials in one variable, rational functions, exponential and logarithmic functions, limits, continuity, differentiability and indefinite integrals of all the above mentioned functions, l'Hospital's rule and its applications;
- problem solving skills to calculate the domain and range, limits, continuity, derivatives and indefinite integrals of all the above mentioned functions, calculate limits using l'Hospital's rule, prove theorems with mathematical induction, determine greatest common divisors and use it to solve Diophantine equations, and perform operations with complex numbers.

Module uitkomstes

Na voltooiing van die module, sal die student 'n deeglike en geordende kennis van, en vaardigheid in

- *die onderliggende beginsels,*
- *die metodes, en*
- *die toepassings van die teorie*

rakende geselekteerde aspekte van die volgende onderwerpe demonstreer:

- *die stelsels van natuurlike getalle insluitend wiskundige induksie, heelgetalle insluitend Euklidiese algoritme en sy toepassings, rasionale getalle, irrasionale getalle, reële getalle en komplekse getalle insluitend De Moivre se stelling en sy toepassings, funksiebegrip, absolutewaardefunksies, sirkelmaat en trigonometriese funksies, inverse funksies en inverse trigonometriese funksies, polinome in een veranderlike, rasionale funksies, eksponensiale en logaritmiëse funksies, limiete, kontinuïteit, differensieerbaarheid en onbepaalde integrale van al bogenoemde funksies, l'Hospital se reël en sy toepassings;*

probleemoplossingsvaardighede om definisie-en waardeversamelings te bereken, limiete, kontinuïteit, afgeleides en onbepaalde integrale van al bogenoemde funksies te bereken, limiete met behulp van l'Hospital se reël te bereken, stellings deur wiskundige induksie bewys, grootste gemene delers bepaal en dit gebruik om Diofantiese vergelykings op te los, en bewerkings met komplekse getalle uit te voer.

Module code: MTHS112 / MTHS123

Semester 1

NQF Level: 5

Title / Titel: Mathematical Techniques / Wiskundige Tegnieke

Module outcomes / Module uitkomstes:

At the end of this module students have mastered the following topics at an introductory level: the concept of a mathematical function elucidated from examples that include exponential and logarithmic functions; the concepts differentiation and integration; a method to solve systems of linear equations; matrix algebra; linear programming problems in two variables; analysis of the rate of change of mathematical functions by using differentiation to investigate the characteristics of the function. The student has acquired skills to recognise the presence and applicability of mathematical concepts in an economic situation and to construct a mathematical model of the problem situation in order to reach a solution by applying differentiation techniques, arithmetic techniques or linear algebra.

Furthermore, the student have to be able to do simple and compound interest calculations, be able to do simple and complex annuity calculations, evaluate the number of payments, final payment and outstanding balance, be able to take the interest rate and changes in sinking funds in consideration.

Aan die einde van hierdie module het die student die volgende onderwerpe op inleidende vlak bemeester: die konsep van 'n wiskundige funksie vanuit voorbeelde wat eksponensiale en logaritmiëse funksies insluit, die konsepte van differensiasie en integrasie, 'n oplosmetode vir stelsels lineêre vergelykings, matriksalgebra, lineêre programmerings-probleme in twee veranderlikes, analise van die tempo van verandering van wiskundige funksies met die gebruik van differensiasie om die eienskappe van die funksie te ondersoek. Die student verwerf die vaardigheid om die teenwoordigheid en toepasbaarheid van wiskundige konsepte in 'n ekonomiese situasie te herken en 'n wiskundige model van die probleemsituasie te konstrueer ten einde 'n oplossing te verkry deur die toepassing van differensiasie tegnieke, rekenkundige tegnieke of lineêre algebra.

Die student moet verder in staat wees om enkelvoudige en saamgestelde renteberekeninge uit te voer, eenvoudige en komplekse annuïteitsberekeninge uit te voer, die aantal paaiemente, finale paaiement en uitstaande balanse te evalueer, rentekoers en delgingfondse veranderinge in ag te neem.

Module code: MTHS113

Semester 1

NQF Level: 5

Title / Titel: Basic Mathematical Techniques / Basiese Wiskundige Tegnieke

Module outcomes / Module uitkomst:

At the end of this module, students have mastered the following topics at an introductory level: the concept of a mathematical function elucidated from examples that include exponential and logarithmic functions, the concept of differentiation, a method to solve sets of linear equations, matrix algebra, linear programming problems in two variables, analysis of the rate of change of mathematical functions by using differentiation to investigate the characteristics of the function. The student acquires skills to recognise the presence and applicability of mathematical concepts in a scientific situation and to construct a mathematical model of the problem situation in order to reach a solution by applying differentiation techniques, arithmetic techniques or linear algebra.

Aan die einde van hierdie module het die student die volgende onderwerpe op inleidende vlak bemeester: die konsep van 'n wiskundige funksie vanuit voorbeelde wat eksponensiale en logaritmiëse funksies insluit, die konsep van differensiasie, 'n oplosmetode vir stelsels lineêre vergelykings, matriksalgebra, lineêre programmerings-probleme in twee veranderlikes, analise van die tempo van verandering van wiskundige funksies met die gebruik van differensiasie om die eienskappe van die funksie te ondersoek. Die student verwerf die vaardigheid om die teenwoordigheid en toepasbaarheid van wiskundige konsepte in 'n natuurwetenskaplike situasie te herken en 'n wiskundige model van die probleemsituasie te konstrueer ten einde 'n oplossing te verkry deur die toepassing van differensiasietegnieke, rekenkundige tegnieke of lineêre algebra

Module code: MTHS114

Semester 1

NQF Level: 5

Title / Titel: Toegepaste Calculus/ Applied Calculus

Module outcomes / Module uitkomst:

Students will not be credited for more than one of MTHS111 and MTHS114. MTHS114 is intended for students who require mathematics at first year level only, and does not lead to admission to any second year mathematics or applied mathematics module.

On completion of this module, the student will demonstrate a thorough and advanced knowledge of, and skill in

- the basic principles,
- and the application of the theory

regarding selected aspects of the following topics:

- Functions;
- Rates of change, limiting behaviour, and the derivative;

- Techniques of differentiation;
- Functions revisited (exponential and logarithmic en trigonometric);
- Applications of the derivative;
- The concept of integration, its interpretation, and basic properties en basic integration rules.

All topics are studied in the context of applications.

Studente sal nie met meer as een van MTHS111 en MTHS114 gekrediteer word nie. MTHS114 is bedoel vir studente wat wiskunde op slegs eerstejaar vlak nodig het, en gee geensins toegang tot enige tweedejaar Wiskunde of Toegepaste Wiskunde modules nie.

Na voltooiing van die module, sal die student 'n deeglike en geordende kennis van, en vaardigheid in

- *die basiese beginsels,*
- *en die toepassing van die teorie*

rakende geselekteerde aspekte van die volgende onderwerpe demonstreer:

- *Funksies;*
- *Tempos van verandering, limiet gedrag, en die afgeleide;*
- *Differensiasietegnieke;*
- *Funksies herbesoek (eksponensieel, logaritmië, trigonometrië);*
- *Toepassings van die afgeleide;*
- *Die konsep van integrasie, interpretasie, en basiese eienskappe en basiese integrasiereëls.*

Alle onderwerpe word in die konteks van toepassings bestudeer.

Module code: MTHS121 (WISN121)

Semester 2

NQF Level: 5

Title / Titel: Introductory Algebra and Analysis II / Inleidende Algebra en Analise II

Module outcomes / Module uitkomst:

On completion of this module, the student will demonstrate a thorough and advanced knowledge of, and skill in

- the underlying principles,
- the methods, and
- the application of the theory

regarding selected aspects of the following topics:

- vectors in three dimensional space, their properties and applications, rational functions including partial fractions, permutation, combinations, the Binomial theorem, introduction to linear algebra and its applications to systems of linear equations, the use of derivatives in optimisation and curve sketching, Taylor series including the basic theorems on the convergence of series, the fundamental theorems of differential and integral calculus, Riemann sums, the basic properties and applications of the definite integral, advanced integral techniques (including rational functions and partial fractions), hyperbolic and inverse hyperbolic functions, and applications of integration to surfaces, lengths and volumes;
- problem solving skills to describe three dimensional spaces, to calculate dot, cross and triple products and use it to solve a variety of problems, decompose rational functions into partial fractions, determine the number of arrangements and selections from a set, do binomial expansions, solving systems of linear equations with Gauss-

reduction, manipulating matrices, sketch functions, formulate optimisation problems mathematically and use knowledge of derivatives to solve them, calculate Taylor series and judge its convergence, determine Riemann sums, determine definite integrals, and calculate surfaces, lengths and volumes.

Module uitkomst

Na voltooiing van die module, sal die student 'n deeglike en geordende kennis van, en vaardigheid in

- die onderliggende beginsels,
- die metodes, en
- die toepassings van die teorie

rakende geselekteerde aspekte van die volgende onderwerpe demonstreer:

- vektore in die driedimensionele ruimte, hul eienskappe en gebruike, permutasies, kombinasies, die binomiaalstelling, inleiding tot lineêre algebra en toepassing op stelsels lineêre vergelykings, die gebruik van afgeleides in optimalisering en krommesketsing, Taylor-reekse insluitend die basiese stellings oor die konvergensie van reekse, die fundamentele stellings van differensiaal- en integraalrekenre, Riemannsomme, die bepaalde integraal se basiese eienskappe en gebruike, gevorderde integrasietegnieke (insluitend rasionale funksies en parsieële breuke), hiperboliese en inverse hiperboliese funksies, en toepassings van integrasie op oppervlaktes, lengtes en volumes;
- probleemoplossingsvaardighede om drie-dimensionele ruimtes te beskryf, punt-, kruis- en trippelprodukte te bereken en gebruik om 'n verskeidenheid van probleme op te los, rasionale funksies in parsieële breuke te ontbind, die aantal rangskikkings en keuses uit 'n versameling te bepaal, binomiaaluitbreidings te doen, oplos van stelsels lineêre vergelykings met Gauss-reduksie, manipulasie van matrikse, funksies te skets, optimeringsprobleme in 'n wiskundige formulering te giet en die kennis van afgeleides gebruik om dit op te los, Taylor-reekse te bereken en die konvergensie daarvan te beoordeel, Riemannsomme te bepaal, bepaalde integrale te bepaal, en oppervlaktes, lengtes en volumes te bereken.

Module code: MTHS124	Semester 2	NQF Level: 5
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Title / Titel: Toegepaste Calculus / Applied Calculus

Module outcomes / Module uitkomst:

Students will not be credited for more than one of MTHS121 and MTHS124. MTHS124 is intended for students who require mathematics at first year level only, and does not lead to a and does not lead to admission to any second year mathematics or applied mathematics module.

On completion of this module, the student will demonstrate a thorough and advanced knowledge of, and skill in

- the basic principles,
- and the application of the theory

regarding selected aspects of the following topics:

- Anti-derivatives and integration techniques;
- Applications of the integral;
- Introduction to functions of several variables (understanding two-variable functions, partial derivatives, basic optimisation);
- Review of trigonometric functions; differentiation and integration rules;
- Modelling with differential equations : introductory concepts;
- Introduction to series and their applications;

- Introduction to the basic concepts of elementary probability.

All topics are studied in the context of applications.

Studente sal nie met meer as een van MTHS121 en MTHS124 gekrediteer word nie. MTHS114 is bedoel vir studente wat wiskunde op slegs eerstejaar vlak nodig het, en gee geensins toegang tot enige tweedejaar Wiskunde of Toegepaste Wiskunde modules nie.

Na voltooiing van die module, sal die student 'n deeglike en geordende kennis van, en vaardigheid in

- *die basiese beginsels,*
- *en die toepassing van die teorie*

rakende geselekteerde aspekte van die volgende onderwerpe demonstreer:

- *Antiafgeleides en integrasie tegnieke;*
- *Toepassings van die integraal;*
- *Inleiding tot meerveranderlike funksies (verstaan van twee-veranderlike funksies, partiële afgeleides, basiese optimalisering);*
- *Oorsig oor trigonometriese funksies; differensiasie en integrasieëls;*
- *Modellering met differensiaalvergelykings : inleidende konsepte;*
- *Inleiding tot reekse en toepassings;*
- *Inleiding tot die basiese konsepte van elementêre waarskynlikheid.*

Alle onderwerpe word in die konteks van toepassings bestudeer.

Module code: MTHS211
(formerly WISN211 and the first half of MAYM227)

Semester 1

NQF Level: 6

Title / Titel: Advanced Calculus I /Gevorderde Calculus I

Module outcomes / *Module uitkomst:*

Module outcomes

On completing this module, students should be able to do the following:

- Demonstrate a thorough knowledge and insight into all the aspects of the differential calculus of multivariate functions: partial and directional derivatives, the gradient function, optimisation problems, including Lagrange's method, directional derivatives and gradients, and double and triple integrals.
- Demonstrate problem solving skills by analysing familiar and unfamiliar problems, using knowledge of techniques to solve practical problems modelled with multivariate functions.
- Students should demonstrate the ability to use the geometric and physical meaning of the above-mentioned concepts describe the underlying mathematical structure of applied problems and to interpret the significance of the mathematical solutions.

Module uitkomstes

Na voltooiing van hierdie module behoort die studente die volgende te kan doen:

- *Grondige kennis en begrip demonstreer in al die aspekte van differensiaalrekening van meerveranderlike funksies: partiële- en rigtingafgeleides, die gradiëntfunksie; optimeringsprobleme insluitende Lagrange se metode, rigtingsafgeleides en gradiënte, asook berekening van dubbel- en drievoudige-integrale.*
- *Probleemoplossingsvaardighede demonstreer deur bekende en onbekende probleme te analiseer, kennis van tegnieke gebruik om praktiese probleme wat deur meer veranderlike funksies gemodelleer word, op te los.*
- *Die meetkundige en fisiese betekenis van die bogenoemde konsepte kan gebruik om die onderliggende wiskundige struktuur van toegepaste probleme te kan formuleer, en die betekenis van die wiskundige oplossing kan interpreteer.*

Module code: MTHS212 (formerly WISN212 and the first half of MAYM217)

Semester 1

NQF Level: 6

Title / Titel: Linear Algebra I / Lineêre Algebra I

Module outcomes / *Module uitkomste:*

On completion of this module, the student will demonstrate a thorough and advanced knowledge of, and skill in

- the underlying principles,
- the methods, and
- the application of the theory

regarding selected aspects of the following topics:

- Systems of linear equations and their solution(s), including geometrical interpretations where applicable;
- Matrices and their operations, including inverses of matrices;
- The vector spaces \mathbf{R}^n and subspaces, including the column space and nullspace of a matrix, linear dependence and independence, bases, dimension and the rank and nullity of a matrix;
- Linear transformations, including geometrical interpretations in two dimensions;
- Determinants with applications such as Cramer's rule, the area of a parallelogram and volume of a parallelepiped;
- Eigenvalues and eigenvectors of matrices.
- Applications to systems of linear differential equations.

Na voltooiing van die module, sal die student 'n deeglike en geordende kennis van, en vaardigheid in

- *die onderliggende beginsels,*
- *die metodes, en*
- *die toepassings van die teorie*

rakende geselekteerde aspekte van die volgende onderwerpe demonstreer:

- *Stelsels lineêre vergelykings en hulle oplossing(s), insluitend meetkundige interpretasies waar toepaslik;*
- *Matrikse en hulle bewerkings, insluitende inverses van matrikse;*

- Die vektorruimtes \mathbf{R}^n en deelruimtes, insluitend die kolomruimte en nulruimte van 'n matriks, lineêr afhanklikheid en onafhanklikheid, basisse, dimensie en die rang en kerndimensie (nulheidsgraad) van 'n matriks;
- Lineêre transformasies, insluitend meetkundige interpretasies in twee dimensies;
- Determinante met toepassings soos Cramer se reël, die oppervlakte van 'n parallelogram en die volume van 'n parallelipedum;
- Eiewaardes en eievektore van matrikse.
- Toepassings op stelsels lineêre differensiaalvergelykings.

Module code: MTHS225 (WISN223)

Semester 2

NQF Level: 6

Title / Titel: Discrete Mathematics / Diskrete Wiskunde

Module outcomes / *Module uitkomst:*

On completing this module, students should be able to do the following: demonstrate a sound knowledge and understanding proportional- and predicate logic and logical argumentation; general proving techniques, including direct and indirect arguments and counter examples; basic notation and the properties of set theory and Boolean algebra; calculation of probabilities by basic counting techniques; properties of mathematical functions and the pigeonhole principle; the introductory graph theory; demonstrate the ability to solve well-defined, familiar and unfamiliar problems by using mathematical concepts; identify the applicability of the proportional- and predicate logic in

practical situations, formulate a problem in mathematical symbols and obtain new information in the specific situation, to use suitable proving techniques in practical situations, recognise and apply

the properties of set theory and Boolean algebra; basic counting and the pigeonhole principle and

graph theory on practical problems; demonstrate the skills to recognise the presence and applicability of mathematical concepts in a practical situation and be able to program the concepts in the correct way.

Na voltooiing van hierdie module behoort die studente die volgende te kan doen: grondige kennis en begrip te demonstreer van proporsionele- en predikaatlogika en logiese argumentering; algemene bewystegnieke, insluitende direkte en indirekte argumente asook teenvoorbeelde; basiese notasie en die eienskappe van versamelingsteorie en Boleense algebra; die berekening van waarskynlikhede deur gebruik te maak van basiese teltegnieke; eienskappe van wiskundige funksies en die vakkiebeginsel; inleidende grafiekteorie; die vermoë demonstreer om goed gedefinieerde, bekende en onbekende probleme op te los deur wiskundige konsepte te gebruik; identifiseer die toepaslikheid van proporsionele- en predikaatlogika in praktiese situasies; formuleer 'n probleem in wiskundige notasie, om gepaste bewystegnieke te gebruik in praktiese situasies; die eienskappe van versamelingsteorie en Boleense algebra kan erken en kan toepas; basiese teltegnieke, die vakkiebeginsel en grafiekteorie se toepassing op praktiese probleme; vaardighede kan demonstreer om die teenwoordigheid en toepaslikheid van wiskundige konsepte in praktiese situasies te identifiseer en die vermoë om die konsepte op die korrekte wyse te kan programmeer.

Module code: MTHS221 (formerly WISN224 and the second half of MAYM227)	Semester 2	NQF Level: 6
Title / Titel: Advanced Calculus II / Gevorderde Calculus II		
<p>Module outcomes / <i>Module uitkomst</i>: On completion of this module, the student will demonstrate a thorough and advanced knowledge of, and skill in</p> <ul style="list-style-type: none"> the underlying principles, the methods, and the application of the theory regarding selected aspects of the following topics: Functions from \mathbb{R}^n to \mathbb{R}^m (vector fields), the differentiation of and chain rule for such functions, Taylor's theorem, line integrals and the Fundamental Theorem of line integrals, Green's theorem, oriented surfaces and surface integrals, rotation and divergence, the theorems of Stokes and Gauss. Convergence criteria for sequences of real numbers (monotone convergence, Cauchy sequences, $\limsup = \liminf$), description of topological aspects in terms of sequences (Bolzano-Weierstrass property for sequences, limit and continuity of functions, properties of continuous functions). Convergence of series, standard convergence tests, absolute and conditional convergence, power series and convergence intervals for power series, power series representations of functions, differentiation and integration of power series, Taylor and Maclaurin series (approximating functions with polynomials). 		
<p><i>Na voltooiing van die module, sal die student 'n deeglike en geordende kennis van, en vaardigheid in</i></p> <ul style="list-style-type: none"> <i>die onderliggende beginsels,</i> <i>die metodes, en</i> <i>die toepassings van die teorie</i> <p><i>rakende geselekteerde aspekte van die volgende onderwerpe demonstreer:</i></p> <ul style="list-style-type: none"> <i>Funksies van \mathbb{R}^n na \mathbb{R}^m (vektor velde), die differensiasie van en kettingreel vir sulke funksies, Taylor se stelling, lynintegrale en die Grondstelling van lynintegrale, Green se stelling, gerigte oppervlakke en oppervlakintegrale, rotasie en divergensie, die stellings van Stokes en Gauss.</i> <i>Konvergensie kriteria vir rye reele getalle (monotone konvergensie, Cauchy rye, $\limsup = \liminf$), beskrywing van topologiese aspekte in terme van rye (Bolzano-Weierstrass eienskap vir rye, limiet en kontinuiteit van funksies, eienskappe van kontinue funksies).</i> <i>Konvergensie van reekse, standaard konvergensie toetse, absolute en voorwaardelike konvergensie, magreekse en konvergensieintervalle vir magreekse, magreeksvoorstellings van funksies, differensiasie en integrasie van magreekse, Taylor- en Maclaurinreekse (benadering van funksies met polinome).</i> 		
Module code: MTHS223	Semester 2	NQF Level: 6
Title / Titel: Engineering Analysis / Ingenieursanalise		
<p>Module outcomes / <i>Module uitkomst</i>: On completing this module, students should be able to demonstrate advanced knowledge of and insight into the application of:</p>		

- Vector fields, line integrals and the Fundamental Theorem of line integrals, Green's theorem, oriented surfaces and surface integrals, rotation and divergence, the theorems of Stokes and Gauss.
- Convergence criteria for sequences of real numbers and the monotone convergence principle, Convergence of series, standard convergence tests, absolute and conditional convergence, introduction to power series, Taylor's theorem.
- Definition of derivatives and contour integrals of complex functions, Laurent's theorem (as an extension of Taylor's theorem), algebraic manipulation of Laurent series, formal definition of the Z-transform and basic rules for Z-transforms, partial fraction method for computing inverse transforms, applications to difference equations.

By voltooiing van die module, behoort studente gevorderde kennis en insig in die toepassing van die onderstaande kan demonstreer:

- *Vektorvelde, lynintegrale en die Grondstelling van lynintegrale, Green se stelling, gerigte oppervlakke en oppervlakintegrale, rotasie en divergensie, die stellings van Stokes en Gauss.*
- *Konvergensie kriteria vir rye reële getalle en die monotoon konvergensiebeginsel, konvergensie van reekse, standaard konvergensie toetse, absolute en voorwaardelike konvergensie, inleiding tot magreekse, Taylor se stelling.*
- *Definisie van afgeleides en kontoerintegrale van komplekse funksies, Laurent se stelling (as 'n uitbreiding van Taylor se stelling), algebraïese manipulasie van Laurent reekse, formele definisie van die Z-transform en basiese reëls vir Z-transforms, die parsiele breuke metode om inverse transforms te bereken, toepassings op verskillergelykings.*

Module code: MTHS222 (formerly WISN226 and the 2nd half of MAYM217)

Semester 2

NQF Level: 6

Title / Titel: Linear Algebra II / Lineêre Algebra II

Module outcomes / Module uitkomst:

On completion of this module the student should:

- demonstrate a thorough knowledge of and insight into general vector spaces and bases; inner products; vector norms; linear transformations, the use of eigenvalues and eigenvectors, diagonalisation and the advanced skill to apply vector norms, orthogonalisation, symmetric matrices, quadratic forms, and matrix factorisations.
- demonstrate skill in problem solving and proof techniques by analysing known and unknown problems and applications and applying the knowledge and techniques of linear algebra.

By voltooiing van die module, behoort studente:

- *'n deeglike kennis te hê van en insig te toon in algemene vektorruimtes en basisse; inprodukte; vektornorme; lineêre transformasies; die gebruik van eiewaardes en eievektore; diagonalisering; vaardigheid in die toepassing van elk van vektornorme, ortogonalisering, simmetriese matrikse, kwadratiese vorme en matriksfaktoriserings.*
- *Vaardigheid in probleemoplossing en bewystegnieke te toon deur bekende en onbekende probleme en toepassings te ontleed en die kennis en tegnieke van lineêre algebra toe te pas.*

Module code: MTHS224	Semester 2	NQF Level: 6
Title / Titel: Applied Linear Algebra / Toegepaste Lineêre Algebra		
<p>Module outcomes / <i>Module uitkomst</i>: On completion of this module the student should:</p> <ul style="list-style-type: none"> • demonstrate advanced knowledge of and insight into bases and linear independence of functions, and be able to use it in applications; • be able to use concepts like eigenvalues and eigenvectors in applications such as diagonalisation, discrete dynamical systems and systems of linear differential equations; • be able to use the concepts of inner product, length and orthogonality to find orthogonal bases and master their applications such as for example the least squares method and linear models; symmetric matrices and further applications; • demonstrate problem-solving skills by analysing known and unknown problems and applications and applying the knowledge and techniques of linear algebra. • be able to do different matrix decomposition of matrices and know where and how it is applicable in applications. <p><i>By voltooiing van die module, behoort studente:</i></p> <ul style="list-style-type: none"> • 'n deeglike kennis van en insig te toon in basisse en lineêr onafhanklikheid van funksies toon en in staat wees om dit in toepassings te gebruik; • in staat te wees om begrippe soos eiewaardes en eievektore in toepassings soos diagonalisering, diskrete dinamiese stelsels en stelsels lineêre differensiaalvergelykings te gebruik; • in staat wees om die begrippe van inproduk, lengte en ortogonaliteit te gebruik om ortogonale basisse te vind en hulle toepassings te bemeester, soos byvoorbeeld die kleinste-kwadratemetode en lineêre modelle, simmetriese matrikse en verdere toepassings; • probleemoplossingsvaardighede te demonstreer deur bekende en onbekende probleme en toepassings te ontleed en die kennis en tegnieke van lineêre algebra te gebruik. • in staat wees om verskillende matriksontbindings te doen en te weet hoe en waar dit van toepassing is. 		
Module code: WISN312	Semester 1	NQF Level: 7
Title / Titel: Combinatorics / Kombinatorika		
<p>Module outcomes / <i>Module uitkomst</i>: On completing this module, students should be able to do the following: demonstrate a rounded and systematic knowledge and insight into the fundamental counting principles; the binomial theorem; the pigeon hole principle; generalised permutations and arrangements; recursion relations and their solutions, and generating functions; fundamental graph theoretical concepts; partition numbers; imbedding of graphs into surfaces; concept of connectedness; Menger's theorem; independence numbers; factorisation; Hamilton cycles and Eulerian revolutions; colouring of graphs; demonstrate problem solving skills by interpreting familiar and unfamiliar combinatorial problems and using known techniques to solve them; by formulating problems in terms of graphs; by applying and calculating generating functions; by recognising classical discrete probability problems and solving them; by understanding the arguments and their motivations in proving of theorems and being able to give own formulations of them, and applying these results to solve concrete or abstract problems.</p> <p><i>Na voltooiing van hierdie module behoort die studente die volgende te kan doen: afgeronde en sistematiese kennis en begrip demonstreer van grondliggende telbeginsels, die binomiaalstelling, die vakkiebeginsel, veralgemeende permutasies en rangskikkings, rekursierelasies en hulle oplossings, en voortbrengende funksies, asook van grondliggende grafiekteoretiese begrippe, partisiegetalte, inbeddings van grafieke in oppervlakke, begrippe van</i></p>		

samehang, Menger se stelling, onafhanklikheidsgetalle, faktoriserings, Hamiltonsiklusse en Eulertoere, en kleurings van grafieke; probleemoplossingsvaardighede demonstreer deur bekende en onbekende kombinatoriese probleme te interpreteer en met behulp van die bekende tegnieke op te los, probleme in terme van grafieke te formuleer, voortbrengende funksies toe te pas en te bereken, probleme in klassieke diskrete waarskynlikheid herken en oplos, die argumente en motiverings in die bewyse van stellings te verstaan en in eie formuleringe te kan weergee, en hierdie resultate toe te pas om konkrete of abstrakte probleme op te los.

Module code: WISN313 (Replaced by WISN324= Real Analysis)	Semester 1	NQF Level: 7
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Title / Titel: Complex Analysis / Komplekse Analise

Module outcomes / Module uitkomstes:

After completion of this module students ought to be able to do the following:

- Be able to define and determine the derivatives of complex and vector functions, demonstrate knowledge of the concept of differentiability and analyticity and be familiar with its use, demonstrate knowledge of the concept of a line integral and complex contour integral, be familiar with the theorems of Cauchy and their application in computing complex contour integrals.
- Be familiar with diverse consequences of Cauchy's theorem and their application, demonstrate knowledge of the theorems of Taylor and Laurent and their applications, demonstrate knowledge of singular points and residues of complex functions, be familiar with the description of singular points and the computation of residues, be familiar with Cauchy's Residue theorem and its use.
- Be able to solve several improper integrals and other important real integrals by means residue theory and be able to calculate the maxima and minima of complex functions, be able to apply these theorems in other areas.

Na voltooiing van hierdie module behoort die studente die volgende te kan doen

- *Die afgeleide van komplekse- asook vektorfunksies van meer veranderlike funksies kan definieer en bepaal, kennis demonstreer van die begrippe differensieerbaar en analities en vertrou wees met die gebruike daarvan, kennis demonstreer van die begrip van 'n lynintegraal en komplekse kontoerintegraal, vertrou wees met die stellings van Cauchy en die gebruik daarvan in die berekening van kontoerintegrale*
- *Vertrou wees met diverse gevolge van Cauchy se stelling en die toepassing daarvan, kennis demonstreer oor die stellings van Taylor en Laurent en die gebruike daarvan, kennis demonstreer oor singuliere punte en residue van komplekse funksies, vertrou wees met die beskrywing van singuliere punte en berekening van residue, vertrou wees met Cauchy se residustelling en die gebruik daarvan.*
- *Verskeie oneintlike integrale en ander belangrike integrale kan oplos met behulp van residuerekening, die maksima en minima van komplekse funksies kan bereken, en kan toepas in ander gebiede*

Module code: WISN322	Semester 2	NQF Level: 7
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Title / Titel: Algebraic Structures / Algebraiese Strukture

Module outcome / Module uitkomstes:

On completing this module, students should be able to do the following: demonstrate a rounded and systematic knowledge and insight into general algebraic structures, for instance groups, rings and fields, permutations, polynomials with integer coefficients and factor rings formed from polynomial rings; demonstrate skills to prove the fundamental theorems of the theory and apply the concepts amongst others to the integer numbers modulo "n" by means of logical, axiomatic arguments; to give a cyclical representation of permutations; to perform calculations with polynomials with integer coefficients (modulo n); demonstrate skills to apply the theory of factor rings formed from polynomial rings and to perform error correcting coding and decoding; to have

the ability to solve in unknown contexts problems that relate to algebraic structures by applying relevant techniques.

Na voltooiing van hierdie module behoort die studente die volgende te kan doen: afgeronde en sistematiese kennis te demonstreeer van algemene algebraïese strukture soos bv. groepe, ringe en liggame, permutasies, polinome met heelgetalkoëffisiënte en faktorringe gevorm uit polinoomringe; vaardighede demonstreeer om die fundamentele stellings oor die teorie te bewys en met behulp van logiese, aksiomatiese redenasie hierdie begrippe te kan toepas op o.a. die heelgetalle modulo n , permutasies in siklusvoorstelling kan gee, rekenwerk met polinome met heelgetalkoëffisiënte (modulo n) kan doen; vaardig wees om die teorie rakende faktorringe gevorm uit polinoomringe te kan toepas en foutkorrigerende kodering en dekodering uit te voer; vermoë hê om in onbekende kontekste probleme rakende algebraïese strukture te kan oplos deur toepassing van toepaslike tegnieke.

Module code: WISN314 (Old code WISN323)

Semester 1

NQF Level: 7

Title / Titel: Real Analysis / Reële Analise

Module outcomes / Module uitkomst:

After the completion of this module the students should be able to do the following

- demonstrate a fundamental knowledge of the theory of real numbers; the topology of finite dimensional vector spaces; compactness and connectedness; continuous and uniformly continuous functions; continuous images of compact and connected sets; convergence of sequences and Cauchy-sequences; convergence and uniform convergence of sequences of functions; Riemann- integration; differentiation of vector functions of several variables; implicit function theorem for such functions; bijections, diffeomorphisms and open mappings; extreme values with and without constraints; Lagrange's method; inequalities of Cauchy-Schwarz, Hölder and Minkowski.
- demonstrate the ability to solve problems in the area of real analysis; be able to test functions for their continuity and differentiability, be able to solve problems in integration and differentiation theory, be able to solve extreme value problems with and without constraints, be able to apply abstract mathematical theorems and concepts in related areas such as probability theory.

Na voltooiing van hierdie module behoort die studente die volgende te kan doen

- *fundamentele kennis demonstreeer van die teorie van reële getalle; die topologie van eindig dimensionele vektorruimtes; kompaktheid en samehangendheid van versamelings; kontinue en gelykmatig kontinue funksies; kontinue beelde van kompakte en samehangende versamelings; konvergensie van rye en Cauchy-rye; konvergensie en gelykmatige konvergensie van rye funksies; Riemann- integrasie; differensiasie van vektorwaardige funksies van meer veranderlikes; implisiete funksiestelling; bijeksies, diffeomorfismes en oop afbeeldings; ekstreemwaardes met en sonder beperkings; Lagrange se metode; ongelykhede van Cauchy-Schwarz, Hölder en Minkowski.*
- *probleemoplossingsvaardighede demonstreeer deur bekende en onbekende analise-probleme te analiseer, funksies te toets vir kontinuïteit, probleme uit integrasie en differensiasieteorie op te los, ekstreemwaarde probleme met en sonder beperkings op te los en om abstrakte wiskunde-stellings en begrippe in gebiede soos waarskynlikheidsleer toe te pas.*

**NAS.2.8.24 UNDERSTANDING THE ECONOMIC AND NATURAL WORLDS /
VERSTAAN DIE EKONOMIESE EN NATUURLIKE WÊRELD**

Module code: WVES221	Semester 2	NQF Level: 6
Title / Titel: Understanding the economic world / Verstaan die Ekonomiese Wêreld		
<p>Module outcomes / <i>Module uitkomst</i>: Upon completion of this module, you should be able to:</p> <ul style="list-style-type: none"> • have a fundamental knowledge base of a selection of world views and ideologies; • demonstrate their critical understanding through an ability to compare the nature and function, as well as different contemporary manifestations of these world views and ideologies; • have the ability to understand the interrelatedness of phenomena such as occurs in natural and social systems, and from this vantage point, analyse and evaluate real life problems or case studies based on core issues of our time, such as poverty, constant change, human rights, HIV-AIDS, power abuse, corruption, racism, xenophobia, etc.; • be able to articulate their personal world view and use it as a point of departure for arguing and communicating feasible solutions to core issues and problems of our time in a typical academic manner. <p><i>Na afhandeling van hierdie module behoort u in staat te wees om:</i></p> <ul style="list-style-type: none"> • 'n grondige kennisbasis te hê van 'n verskeidenheid wêreldbeskouings en ideologië en sy/haar kritiese verstaan daarvan te demonstreeer deur die aard en funksie, sowel as die verskillende moderne/kontemporêre manifestasies van die wêreldbeskouings en ideologië te vergelyk; • die vermoë te hê om die verbande van fenomene soos dit in die natuurlike en sosiale sisteme voorkom te verstaan en vanuit sy/haar vertrekpunt, werklike lewensvraagstukke of gevalle studies te analiseer en evalueer, gebasseer op kernvraagstukke van ons tyd, soos armoede, voortdurende verandering, menseregte, HIV-VIGS, magsmisbruik, korrupsie, rassisme, rassehaat, ens.; • sy/haar persoonlike wêreldbeskouing te kan oordra en dit te gebruik as 'n vertrekpunt om werkbare oplossings vir kernvraagstukke en probleme van ons tyd, op 'n tipies akademiese wyse te kan argumenteer en kommunikeer. 		
Module code: WVES311	Semester 1	NQF Level: 7
Title / Titel: Business ethics / Bedryfsetiek		
<p>Module outcomes: / <i>Module uitkomst</i> After completion of this module you should:</p> <ul style="list-style-type: none"> • Possess knowledge of <ul style="list-style-type: none"> ➢ selected ethical theories <ul style="list-style-type: none"> ➢ moral decision-making strategies ➢ selected socio-economic ethical issues ➢ selected issues and approaches with regard to business ethics ➢ the nature of organizations and management from an ethical perspective • Possess the ability and skills to apply the above knowledge to case studies • Possess the ability and skills to analyse and evaluate the abovementioned theories and issues from different philosophical and ideological perspectives. <p><i>Na afhandeling van hierdie module behoort u in staat te wees om:</i></p> <ul style="list-style-type: none"> • kennis te dra van: <ul style="list-style-type: none"> ➢ geselekteerde etiese teorieë; ➢ strategieë vir morele besluitneming; 		

- *geselekteerde sosio-ekonomiese etiese kwessies;*
- *geselekteerde kwessies en benaderings in besigheidsetiek; en*
- *die aard van organisasies en van bestuur vanuit 'n etiese perspektief.*
- *oor die vermoë en vaardighede te beskik om bogenoemde kennis toe te pas op gevallestudies;*
- *die bogenoemde teorieë en kwessies te kan analiseer en evalueer vanuit verskillende filosofiese en/of ideologiese perspektiewe*

Module code: WVNS211

Semester 1

NQF Level: 6

Title / Titel: Understanding the natural world / Verstaan die natuurlike wêreld

Module outcomes / *Module uitkomst:*

This module will, upon its successful completion, serve as a fundamental source of knowledge for students regarding the nature and function of worldviews and ideologies as these have developed historically from science, from the ancient to the postmodern era. Student will also understand the relationship between norms and science, the influence of science and technology on the spiritual, cultural and material worldview of mankind, its community and environment. Students must be able to understand, discuss and explain key concepts regarding the development of science in the context of value systems as they function in their worldview. The module strives to achieve the following overarching outcomes:

1. That students will develop a knowledge base consisting of a selection of world pictures/views and ideologies and be able to demonstrate their critical understanding thereof in the light of an ability to set out, analyse and evaluate the nature, function and various contemporary manifestations thereof.
2. That students will be able to demonstrate and make allowance for the influence of various world pictures/views on the scientific and technological development in their own forming of paradigms.
3. That students will develop the ability to understand the interrelationship between scientific and social phenomena and to analyse and evaluate from this paradigm contemporary problems and to offer appropriate solutions.
4. That students will be able to articulate and defend their personal world picture/view while using this as a point of departure in a quest for effective solutions for the major problems of our time.

“Hierdie module sal, ná die suksesvolle voltooiing daarvan, vir die student as fundamentele kennisbron dien van die aard en funksie van wêreldbeskouings en ideologieë soos dit geskiedkundig uit die wetenskap ontwikkel het van die antieke tot die postmoderne era. Die student sal ook die verhouding tussen norme en wetenskap, die invloed van wetenskap en tegnologie op die geestelike, kulturele en materiële wêreldbeskouing van die mens, sy gemeenskap en omgewing, verstaan. Die student moet kernbegrippe rondom die ontwikkeling van die wetenskap in die konteks van waardesisteme, soos dit in hulle wêreldbeskouing funksioneer, kan verstaan en bespreek en verduidelik”. Die Module streef daarna om die volgende oorkepelende uitkomst te bereik:

1. *Dat studente 'n kennisbasis van 'n seleksie van wêreldbeelde en ideologieë sal ontwikkel en hul kritiese begrip daarvan sal kan demonstreer aan die hand van 'n vermoë om die aard, funksie en verskillende kontemporêre manifestasies daarvan te kan weergee, analiseer en evalueer*
2. *Dat studente die invloed van verskillende wêreldbeelde op die natuurwetenskaplike en tegnologiese ontwikkeling sal kan demonstreer en verdiskonteer in hul eie paradigmatvorming.*
3. *Dat studente die vermoë sal ontwikkel om die interverwantskap van natuurwetenskaplike en sosiale fenomene te verstaan, en vanuit hierdie paradigma hedendaagse probleme te analiseer, te evalueer en oplossings aan te bied.*

4. *Dat studente in staat sal wees om hul persoonlike wêreldbeeld te artikuleer en te verdedig, en dit as vertrekpunt te gebruik in 'n soeke na effektiewe oplossings vir die hoof-probleme van ons tyd*
5. *Dat studente in staat sal wees om die wetenskaplike navorsingsmetodiek met integriteit toe te pas.*

Module code: WVNS221

Semester 2

NQF Level: 6

Title / Titel: Science, Technology and Society Understanding the natural world? / Wetenskap, Tegnologie en samelewing Verstaan die natuurlike wêreld?

Module outcomes / *Module uitkomst:*

The module Science, Technology and Society strives to achieve the following overarching outcomes:

That students may develop the ability to identify, analyse and evaluate the reciprocal influence of world views and ideologies (society) on the development and continuation of science and technology.

That students will be able to demonstrate and make allowance for the influence of various world views on the natural scientific and technological development in forming their own paradigm.

That students will develop the ability to understand the interrelationship of natural scientific and social phenomena and to analyse from this paradigm by means of systems thinking and an interdisciplinary approach, the ethical aspects of contemporary problems that pose a threat to sustainable development on earth.

That students will be able to write down their personal convictions regarding STS, put these into words and present it by means of a PowerPoint presentation.

That students will be able to apply scientific research methodology with integrity.

The specific outcomes for this module (WVNS 211) as expressed in the NWU

Yearbook/Calendar are as follows:

On successful completion of this module, the student must be able to identify, demonstrate and critically respond to the basic issues in contemporary discussions with regard to science, technology and society, with specific reference to the scientific and technology systems in South Africa. The student must also be able to identify the most important ethical issues in the subject areas of a programme and react critically to these in accordance with a value-based orientation within a specific world view. Students must be able to form a carefully thought-out, reasoned point of view regarding the idea of sustainable development, one including the socio-economic implications thereof. Students must be able to discuss perspectives with regard to different systems of thought and to look closely at contemporary issues in science and technology within a system perspective.

Die Module oor "Wetenskap, Tegnologie en samelewing" streef daarna om die volgende oorkoepelende uitkomst te bereik:

Dat studente die vermoë sal ontwikkel om die wedersydse invloed van wêreldbeelde en ideologieë (samelewing) op die ontwikkeling en voortgang van die wetenskap en tegnologie te kan identifiseer, analiseer en evalueer

Dat studente die invloed van verskillende wêreldbeelde op die natuurwetenskaplike en tegnologiese ontwikkeling sal kan demonstreer en verdiskonteer in hul eie paradigmavorming.

Dat studente die vermoë sal ontwikkel om die interverwantskap van natuurwetenskaplike en sosiale fenomene te verstaan, en vanuit hierdie paradigma m.b.v. stelsel denke en 'n interdisiplinêre benadering die etiese aspekte hedendaagse probleme wat volhoubare ontwikkeling op aarde bedreig te analiseer, te evalueer en oplossings aan te bied.

Dat studente in staat sal wees om hul persoonlike oortuigings oor wetenskap, tegnologie en samelewing te kan neerskryf in referaatvorm, dit te kan artikuleer en dit te kan oordra m.b.v. 'n Powerpoint aanbieding.

Dat studente in staat sal wees om die wetenskaplike navorsingsmetodiek met integriteit toe te pas.

Die spesifieke uitkomst van hierdie module (WVNS211), soos in die Jaarboek verwoord, is soos volg:

"Na suksesvolle voltooiing van hierdie module, moet die student die basiese kwessies in kontemporêre gesprekke oor wetenskap, tegnologie en die gemeenskap, met spesifieke verwysing na die wetenskap- en tegnologiesisteme in SA kan identifiseer, demonstree en krities daarop reageer. Die student moet ook van die belangrikste etiese kwessies in die onderwerpareas van 'n program kan identifiseer en krities daarop reageer volgens 'n waardegebaseerde oriëntasie binne 'n spesifieke wêreldbeskouing. 'n Deurdagte, beredeneerde standpunt oor die idee van volhoubare ontwikkeling, wat die sosio-ekonomiese implikasies daarvan insluit, moet deur die student gevorm kan word. Die student moet perspektiewe op verskillende denksisteme kan bespreek en kontemporêre kwessies in wetenskap en tegnologie moet binne 'n sisteemperspektief beskou kan word."

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