Republic of Namibia

MINISTRY OF EDUCATION

JUNIOR SECONDARY PHASE

COMPUTER STUDIES SYLLABUS

JUNIOR SECONDARY PHASE

GRADES 8 - 10

FIRST IMPLEMENTATION
Grade 8 – 2012
Grade 9 – 2013
Grade 10 – 2014

Syllabus Junior Secondary Computer Studies (Grades 8 - 10)

Publication date: 2012

TABLE OF CONTENTS

1. INTRODUCTION

This syllabus describes the intended learning and assessment for Computer Studies in the Junior Secondary Phase. As a subject, Computer Studies is within the Technological area of learning in the curriculum, but has thematic links to other subjects across the curriculum. In the Technological area of learning, learners acquire skills in technology that include applying knowledge of how to do work more efficiently and effectively using tools, materials and processes. Technology is a specific way of solving problems through planning, design, realisation and evaluation. Learners develop the necessary knowledge, skills and attitudes to perform tasks using appropriate technology.

Under optimal circumstances, this subject would need 4 periods in a 5 day cycle or 5 periods in a 7 day cycle.

2. RATIONALE

The application of computers has become an integral part of the present-day society, also in Namibia, to the extent that the skill to use a computer is a major requirement for many vocations and contributes to efficiency in many others. The subject Computer Studies is designed to provide vocational orientation and training in this important domain and is in itself a complete course.

The syllabus for Computer Studies aims to:

- prepare the learner to have a basic knowledge of the computer and to be able to utilize it.
- enable the learner who leaves school to use the computer practically in his/her vocation.
- enable the learner who continues with school to use the computer effectively as an aid to his/her studies or in his/her occupation in the future.
- enable the learner who continues with his/her school career with Computer Studies as a subject to have a sound foundation to build on.
- broaden the horizon and insight of the learner and to make him/her aware of the possibilities and limitations of a computer.
- give the learner a basic education in the methods of gathering and processing data by the use of modern technology.
- develop the learner's knowledge of correct English computer terminology.

3. COMPETENCIES AND LEARNING OUTCOMES

On entry to the Junior Secondary Phase, all learners are expected to be able to read, write, calculate and communicate in English.

A few learners will just be able to manage the minimum, and must receive compensatory teaching through adapted teaching approaches, adapted materials, and assistance from peers.

A small number of learners have special educational needs to a degree which requires greater individual attention or resources. Some will have handicaps which do not necessarily limit cognitive and affective learning and development (visually impaired, hearing impaired, physically challenged). Learners who are intellectually impaired or have Attention Deficit Disorder will have very differing competency profiles. Teaching, materials and assessment for these learners will be more specifically adapted in inclusive classes.

On completing Grade 10, the learners will be computer literate and will have the theoretical background to continue with Computer Studies on Senior Secondary level.

4.   **PARTICULAR CHARACTERISTICS OF THE SUBJECT AT THIS PHASE**

The skill of using a computer, various application packages, and does basic computer programming.

5.   **GENDER ISSUES**

This syllabus promotes equality of opportunity for males and females, enabling both sexes to participate equally and fully. Teachers should know and understand how to treat learners equally, and all materials should support gender equity. During presenting the subject teachers should be gender sensitive and balanced.

6.   **LOCAL CONTEXT AND CONTENT**

Computer Studies will be most relevant and meaningful for learners if it is used in relation to their immediate environment. Although Computer Studies is universal, it is only by local contextualisation and application that learners will understand and appreciate the uses of Computer Studies. Where textbooks can only give general examples, it is up to the teacher to use local examples instead.

7.   **LINKS TO OTHER SUBJECTS AND CROSS-CURRICULAR ISSUES**

The cross-curricular issues including Environmental Learning; HIV and AIDS; Population Education; Education for Human Rights and Democracy (EHRD) and Information and Communication Technology (ICT) have been introduced to the formal curriculum to be dealt with in each subject and across all phases because each of the issues deals with particular risks and challenges in our Namibian society. All of our learners need to:

- understand the nature of these risks and challenges
- know how they will impact on our society and on the quality of life of our people now and in the future
- understand how these risks and challenges can be addressed on a national and global level
- understand how each learner can play a part in addressing these risks and challenges in their own school and local community

The main risks and challenges have been identified as:

- the challenges and risks we face if we do not care for and manage our natural resources
- the challenges and risks caused by HIV and AIDS
- the challenges and risks to health caused by pollution, poor sanitation and waste
- the challenges and risks to democracy and social stability caused by inequity and governance that ignores rights and responsibilities
- the challenges and risks we face from globalisation

Links in this syllabus to cross-curricular issues:

Cross curricular issues	
HIV and AIDS	Statistics can be applied as an exercise to teach spreadsheets and graphs.
Population Education	Information retrieval on this topic from the Internet. This information could be used to create a database.
Human Rights and Democracy Education	Information retrieval from the Internet, e.g. to create a database.
Environmental Learning	Information retrieval from the Internet, e.g. text on pollution

All these topics could be applied for desktop publishing, e.g. create a newsletter or brochure. |

8.   APPROACH TO TEACHING AND LEARNING

The approach to teaching and learning is based on a paradigm of learner-centred education described in Ministry policy documents, curriculum guides, and the conceptual framework. This approach ensures optimal quality of learning when the following principles are put into practice.

The aim is to develop learning with understanding, and the skills and attitudes to contribute to the development of society. The starting point for teaching and learning is the fact that the learner brings to the school a wealth of knowledge and social experience gained continually from the family, the community, and through interaction with the environment. Learning in school must involve, build on, extend and challenge the learner's prior knowledge and experience.

Learners learn best when they are actively involved in the learning process through a high degree of participation, contribution and production.   At the same time, each learner is an individual with his/her own needs, pace of learning, experiences and abilities. The teacher must be able to sense the needs of the learners, the nature of the learning to be done, and how to shape learning experiences accordingly.   Teaching strategies must therefore be varied but flexible within well-structured sequences of lessons.

The teacher must decide, in relation to the learning objectives and competencies to be achieved, when it is best to convey directly; when it is best to let learners discover or explore information for themselves; when they need directed learning; when they need reinforcement or enrichment learning; when there is a particular progression of skills or information that needs to be followed; or when the learners can be allowed to find their own way through a topic or area of content.

Work in groups, in pairs, individually, or as a whole class must therefore be organised as appropriate to the task in hand.   Co-operative and collaborative learning should be encouraged wherever possible. In such cases, tasks must be designed so that pair or group work is needed to complete it, otherwise the learners will not see any relevance in carrying out tasks together. As the learners develop personal, social and communication skills, they can gradually be given increasing responsibility to participate in planning and evaluating their work, under the teacher's guidance.

JSC Computer Studies Syllabus NIED 2012

9. OVERALL PLAN OF THE SYLLABUS

THEMES AND TOPICS	GRADE 8	GRADE 9	GRADE 10
1. Computer Applications			
1.1 Uses of computers	Identify and explain uses		
1.2 Economic implications			
– viruses		Define and explain effects of viruses, the prevention and removal of viruses	
– copyright		Define and explain software copyright	
– security measures		Identify, define and describe security measures	
1.3 Social implications		Changes caused by computers and other technology	
2. Architecture of a Microcomputer			
2.1 Components of a computer	Hardware and software	Systems and application software	Install and uninstall software
2.2 Input devices	Define, describe and use input devices		
2.3 Output devices	Define, describe and use different output devices		
2.4 Input/output devices	Define and explain the uses of input/output devices		
2.5 Storage devices	Identify and explain the uses of different storage devices Formatting a disk Maintenance		
2.6 Data paths			Define and explain data paths
2.7 Number s Systems			Conversions

4

THEMES AND TOPICS	GRADE 8	GRADE 9	GRADE 10
3. Operating systems	List different operating systems	Perform basic operating system functions Define types of operating systems	
4. Application Software	Keyboard and mouse skills Word Processing - basic and advanced commands	Spreadsheets – basic and advanced commands; create formulae Desktop publishing - define and apply basic applications; combine text and graphics Multimedia	Word Processing - merge application software Database – commands and functions
5. Programming	Logo programming	Algorithm design	Algorithm design and Programming
6. Internet		Internet terminology Hardware and software needed Types of links Internet usage	
7. Communication		Transmission of data Network systems	

- **Teachers of grade 9 and -10 learners have to revisit the previous grades' work, for example by giving a test. Examinations should cover all the work done thus far in the PHASE, not only in that grade.**

10. LEARNING CONTENT

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10
1. COMPUTER APPLICATIONS **1.1 Introduction to Computer Uses**	• examine the presence of computers in our everyday lives	• briefly describe the advantages and disadvantages of using computers in everyday life (rural /urban) • briefly debate the uses of using computers world wide		
1.2 Economic implications	• examine the impact of viruses		• define a computer virus • explain the causes and effects of computer viruses • explain the prevention of infection of computer viruses • explain how to remove computer viruses • Classify various types of viruses • Explain the effects of these various types of viruses • Investigate the implications of virus "attacks" on corporations/businesses etc.	

6

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10
1.2 Economic implications (continued)	• examine the impact of viruses (continued)		• Construct a strategy (for your school) to prevent possible virus attacks. • Demonstrate how to use the different features of an anti-virus program	

	• understand software copyright		• define software copyright
			 • explain the importance of a software copyright act (i.e. Digital Millennium Copyright Act)
			 • discuss the consequences of a software copyright act in today's society
			 • compare and contrast the following:
			   - open source software
			   - freeware and shareware
			 • discuss the effects of software piracy locally and world wide
			 • Develop a strategy to reduce software piracy within the community.	

	• understand computer security issues		• explain the following security concepts:
			   - password
			   - physical security
			 • demonstrate good password principles	

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10
1.2 Economic implications (continued)	understand computer security issues (continued)		• explain the following concepts: - firewalls - proxy servers - data protection • explain the following: - hacking - data privacy • propose how you would protect computer systems in the school's computer lab, in corporations and/or banks, etc. - biometric passwords - back-ups - mirror systems - levels of authorisation - encryption	
1.3 Social implications	• examine the social and economic implications of the use of computers		• Describe the impact of computer technology in society: - education - medical field - social interaction - business and employment - communication - information access and storage	

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10

2. ARCHITECTURE OF A MICRO-COMPUTER
2.1 Components of a computer
	• understand the functions, components and the handling of a computer	• explain the functions of the following components:
		- system unit
		- monitor
		- keyboard
		- memory
		- units of measurement
		   ~ internal memory
		   ~ external memory
		• explain the difference between hardware and software
		• define the term 'driver'
			• classify the different types of software as systems or applications software	• install and uninstall an application program and application software

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10
2.2 Input devices	• understand the different types of input devices	• describe the following input devices and explain suitable uses/applications: - keyboard - pointing devices - scanner - joystick - digital cameras - microphones - card reader - web cam - light pen - OMR - OCR - bar code reader - biometric scanners - radio frequency identification (RFID)		
2.3 Output devices	• understand different types of output devices	• identify, define and explain the features and applications of the following output devices: - monitors (cathode ray, LCD, plasma) - printers (matrix, ink, laser) - plotters - speakers/headphones - data projectors		

10

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10

2.4 Input/output devices	• understand different input/output devices	• define and explain the uses and features of the following input/output devices:
		- modem
		    ~ smart phone
		    ~ 3G device
		- fax machine
		- smart board
		- MP3 player
		- wireless devices, e.g. Bluetooth
		- network adaptor
		- Bluetooth adaptor
		- infrared adaptor
		- sound card
		- ISDN adaptor		

2.4 Input/output devices (continued)	• understand different input/output devices (continued)	• identify the following ports: - PS2 port - USB port - serial port - parallel port		
2.5 Storage devices	• understand different storage devices and the handling of such devices	• identify, discuss the functions and describe how to use the following storage devices: - hard disk - magnetic tape - CD-ROM - CD-R ; CD-RW - DVD-ROM		

11

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10
		- DVD-R; DVD-RW - flash disk - memory stick - blu-ray disk - smart cards - MP3 player - solid state drive (SSD) – external hard drive • explain the formatting of a disk • name and apply the rules for maintenance of disks • explain the usefulness of making back-ups		
2.6 Data paths	• examine the way data flows through the computer			• explain how data flows through computers, e.g. a storage device; data to a printer; listen to music from the Internet • explain the role of memory in the data path • explain the advantages of buffering, spooling and cache memory
2.7 Number systems	• understand the difference between the decimal- and binary number systems			• convert decimal numbers into binary numbers convert binary numbers into decimal numbers

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10
3. OPERATING SYSTEMS	• understand operating systems	• define an operating system • start-up and shut down a computer system • run an application program	• list different operating systems, e.g. DOS, Windows, UNIX, Macintosh, etc. • define booting; • find out which application programs are available on a computer system • load a program/ document from a storage device • install a program • perform the following functions on files: copy, cut, paste, delete	

THEMES AND TOPICS	LEARNING OBJECTIVES	BASIC COMPETENCIES Learners should be able to		
	Learners will	GRADE 8	GRADE 9	GRADE 10

3. OPERATING SYSTEMS (continued)	• understand operating systems (continued)		• identify and react on error messages
			• perform the following functions on files and folders:
			  - create
			  - rename
			  - delete
			  - move
			  - copy
			  - sort
			  - access
			  - drag
			• create and delete shortcuts
			• define and compare command line-, menu-driven and graphical user interfaces
			• define and describe the application of the following:
			  - multitasking
			  - time sharing
			  - terminals
			  - batch processing
			  - real-time processing
			  - multi-user
			  - multi-access
			     multi processing	

14

THEMES AND TOPICS	LEARNING OBJECTIVES	BASIC COMPETENCIES Learners should be able to		
	Learners will	GRADE 8	GRADE 9	GRADE 10
3. OPERATING SYSTEMS (continued)	• understand operating systems (continued)		• define and describe various types of utility programs - disk defragmenter - disk compression - anti-virus software - backup and restore - system restore	
4. APPLICATION SOFTWARE **4.1 Keyboard and mouse skills**	• examine the layout and use of the keyboard and the mouse	• name and explain the functions and the various parts of the keyboard and the different keys • master the desired techniques, acquire the necessary skills, ability and speed to type all letters and figures with a high degree of accuracy by using a typing tutor, e.g. Kyrans • use the mouse effectively • open and close a program • develop an awareness of the health- and safety issues associated with computer usage		

THEMES AND TOPICS	LEARNING OBJECTIVES	BASIC COMPETENCIES Learners should be able to		
	Learners will	GRADE 8	GRADE 9	GRADE 10
4.2 Different types of software	• identify and understand the use of general application software	• classify the different types of software as systems or applications software ▪ system software: – operating systems – utility programs ▪ applications software: – word processing – spreadsheet – database – graphics – information retrieval – desktop publishing – computer-aided learning – authoring packages – computer-aided design (CAD) and computer-aided manufacture (CAM) – communication software e.g. FTP software, VOIP		

16

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to GRADE 8	GRADE 9	GRADE 10
4.2 Different types of software (continued)	• identify and understand the use of general application software (continued)	• define the term a suite of software • describe the purpose of a suite of software in terms of their features, advantages and disadvantages describe the purpose of custom-designed software in terms of features, advantages and disadvantages		

4.3 Word Processing	• utilise word processing to type, edit and print a document	• identify the various features of the work area: display areas, status and control areas
		• explain the following terms:
		  - word wrap
		  - insert
		  - overwrite
		• type elementary sentences
		• save files without closing the program
				• create form letters
				• print documents making use of mail merge

THEMES AND TOPICS	LEARNING OBJECTIVES	BASIC COMPETENCIES Learners should be able to		
	Learners will	GRADE 8	GRADE 9	GRADE 10

4.3 Word Processing (continued)	• utilise word processing to type, edit and print a document (continued)	• load saved files
		• apply the following:
		  - setting and changing margins
		  - change the font type, size, colour and style
		  - select, cut, copy, paste and delete text
		  - change alignment
		  - print a document
		  - spell check a document
		  - insert graphics
		• create the following:
		  - tables
		  - columns
		• apply the following:
		  - change page margins using the ruler
		  - search and replace
		  - headers and footers
		  - thesaurus
		  - insert graphics (e.g. clipart), word art and use drawing toolbar		

18

THEMES AND TOPICS	LEARNING OBJECTIVES	BASIC COMPETENCIES Learners should be able to		
	Learners will	GRADE 8	GRADE 9	GRADE 10

4.4 Spreadsheets	• create, edit and print a spreadsheet		• distinguish between different areas of a spreadsheet
			• distinguish between entering values and labels
			• apply the following:
			  - load and save a document
			  - adjust column width and row height
			  - align text
			  - format numbers to two decimal figures
			  - wrap text
			  - select, cut, copy, paste and delete text
			  - change font type, size and style
			  - fill command
			  - print a document
			  - sort
			  - name worksheets
			• create formulae:
			  - own formulae, e.g. A1+A2+A3
			• pre-defined formulae (Sum, Average, Max, Min, Count, Counta)	

19

THEMES AND TOPICS	LEARNING OBJECTIVES	BASIC COMPETENCIES Learners should be able to		
	Learners will	GRADE 8	GRADE 9	GRADE 10

4.4 Spreadsheets (continued)	• create, edit and print a spreadsheet (continued)		• distinguish between entering values, absolute value and labels
			 • create a template for a letterhead or an order form on one page
			 • draw graphs of different types with data from the spreadsheet
			 • utilise the following features:
			   - referencing
			   - data validation
			   - paste special
			   - filter
			 • use complex formulae:
			   - if then…
			 • create a spreadsheet with a chart. Modify the chart with titles, data ranges, size of the chart, colour/textures and labels	

20

THEMES AND TOPICS	LEARNING OBJECTIVES	BASIC COMPETENCIES Learners should be able to		
	Learners will	GRADE 8	GRADE 9	GRADE 10

4.5 Desktop Publishing	• create desktop publishing documents		• define desktop publishing
			• explain the following ways to combine text and graphics:
			  - load a graphics file
			  - use a scanner
			  - cut and paste option
			  - import a picture
			• customise existing templates by changing the following:
			  - font type, size and style
			  - pictures
			  - borders, etc.
			• create a simple publication, e.g. :
			  - brochure
			  - advertisement
			  - business card
			  - letterhead, etc.
			• print the publication by using different features, e.g.:
			  - paper size
			  - format
			  - double-sided printing, etc.	

21

THEMES AND TOPICS	LEARNING OBJECTIVES	BASIC COMPETENCIES Learners should be able to		
	Learners will	GRADE 8	GRADE 9	GRADE 10

4.6 Databases	• create, edit and print a database			• define the term database
				• explain the purpose of a database
				• define the following types of databases:
				  - flat file
				  - relational database
				• describe the following terms:
				  - table
				  - record
				  - field
				  - primary key
				  - foreign key
				  - database file
				• explain the different types of fields
				• explain the difference between design view, form view, query view and report view
				• apply the following:
				  - create a database
				  - change field width
				  - add fields
				  - delete fields
				  - change field types
				• enter data in a database file

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	**GRADE 9**	**GRADE 10**
5. PROGRAMMING	• understand basic programming using LOGO	• use the following commands in Logo: FD, BK, PU, PD, PE, PPT, HT, ST, LT, RT, HOME, CS • draw a picture using Logo • use the repeat command for drawing figures • draw tessellations		

	• understand basic algorithm design		• define an algorithm
			• distinguish between a
			  - pseudo code
			  - flowchart
			• write an algorithm on your daily activities, e.g. what are the steps you follow from waking up until you arrive at school?
			• define a variable
			• initialise variables
			• write algorithms using variables
			• distinguish between problems that could be solved using algorithms and those that do not
			• draw trace tables to test algorithms with suitable test data	

JSC Computer Studies Syllabus NIED 2012

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10

5. PROGRAMMING (continued)	• understand basic algorithm design (continued)
	
	• understand basic algorithm design and programming
			• use a sentinel value in an algorithm
			• use the if.. then.. else.. and case statements in an algorithm
			• use the following loop structures in an algorithm:
			  - for.. do
			  - while.. do
			  - repeat.. until
			• define a sentinel value
			• use a sentinel value in an algorithm
				• explain the following terms: low level language, high level language, compiler, interpreter, assembler
				• construct a program that uses the following concepts:
				  - constant
				  - variable
				  - data types (i.e., integer, real, char, string, Boolean)
				  - assignment statement
				  - simple conditions (e.g. <, >, =, < =, > =, < >)
				  - boolean expressions (e.g. and, or, not)
				  - div and mod
				  - if…then… else…and case statements
				  - loop structures
				    ° for..do
				    ° while..do
				    ° repeat..until
				• distinguish between the use of each of the repetition structures

24

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10
6. INTERNET AND E-MAIL	• utilise the Internet and e-mail for research and communication purposes • understand the requirements for Internet connectivity		• explain why we use e-mail and Internet • describe the advantages and disadvantages of using e-mail and Internet • specify the hardware and software needed for Internet connection (modem, Web browser) • explain the term service provider and its functions • explain proper netiquette • create an e-mail account • write and send an e-mail • search the Internet for cross-curricular issues • send an e-mail with an attachment • compose a drawing illustrating the different elements that comprise an e-mail address.	

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10

6. INTERNET AND E-MAIL (continued)	• utilise the Internet and e-mail for research and communication purposes
	• understand the requirements for Internet connectivity (continued)
			• explain the following:
			  - world wide web (www)
			  - search engines
			  - newsgroups
			  - FTP (file transfer protocol, download and upload)
			  - web site
			  - web page
			  - URL (uniform resource locator)
			  - Hyperlink
			• examine different technologies to connect to the Internet (i.e., ISDN lines, analogue lines, satellite links, wireless, microwave, etc.)
			• create a simple website using Publisher
			• define and describe video conferencing	

∗ Teachers can set up e-mail in the computer lab on a peer-to-peer network so that e-mails are sent only to those connected within the computer classroom.
∗ Internet searches can be simulated using a CD-ROM such as Encarta or similar.

26

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10

7 COMMUNICATION AND NETWORKING
 7.1. Communication
	• examine data communications in terms of data transmission and communication speeds		• define the term data communication
			 • distinguish between receiving and sending devices
			 • list the hardware and software needed for communication:
			 ▪ hardware
			   ° modem (internal and external)
			   ° telephone link
			   ° ISDN adaptor
			   ° ADSL adaptor
			 ▪ software
			   ° e-mail program
			   ° communication software (skype, sms, mms, etc.)
			 • describe how data is transmitted and received
			 • describe how errors can occur during the transmission of data, e.g.
			   ° electrical interference
			   ° changing of bits
			   ° lack of memory
			   ° power failure
			   ° physically damaged medium	

27

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10
7 COMMUNICATION AND NETWORKING **7.1. Communication** (continued) * The Communication theme should be expanded as part of the Internet theme	• examine data communications in terms of data transmission and communication speeds (continued)		• explain what is meant by rate of data transmission • distinguish between serial and parallel transmission of data • differentiate between the following communication ports: - USB - serial - infrared - Bluetooth	
7.2 Networking	• Distinguish between the different types of networks		• explain the purpose of the following network devices: - node - workstation - hub - switch - router - wireless devices - NIC (Network Interface card) - gateway - bridge	

28

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	**GRADE 9**	**GRADE 10**

7.2 Networking (continued)	• Distinguish between the different types of networks (continued)		• differentiate between the following transmission media:
			 - infrared
			 - Bluetooth
			 - satellite
			 - microwave
			 - wireless
			 - cables
			   ° coaxial
			   ° fibre-optic
			   ° twisted pair
			
			 • describe the following:
			 - file server
			 - application server
			 - printer server
			 - web server
			 - proxy server
			
			 • define communications protocol
			
			 • explain why communications protocol is necessary	

JSC Computer Studies Syllabus NIED 2012

THEMES AND TOPICS	LEARNING OBJECTIVES Learners will	BASIC COMPETENCIES Learners should be able to		
		GRADE 8	GRADE 9	GRADE 10
7.2 Networking (continued)	• Distinguish between the different types of networks (continued)		• distinguish between different networks according to ▪ size - local area network (LAN) - metropolitan network (MAN) - wide area network (WAN) (explain why organisations would use a LAN, MAN or WAN, e.g. schools, governments, banks, businesses big or small, medical centres, etc.) ▪ network topology - star - bus - ring - hybrid (describe and draw diagrams of the different topologies) ▪ network architecture - client server - peer-to-peer (describe and compare the above-mentioned networks)	

11   ASSESSMENT

A learner-centred curriculum and learner-centred teaching use a broad range of knowledge and skills, which are relevant to the knowledge-based society. The basic competencies in the syllabuses state what understanding and skills a learner must demonstrate as a result of a teaching-learning process, and which will be assessed. However, it is intended that the curriculum be learning-driven, not assessment and examination driven. Assessment and examination are to support learning.

11.1   Continuous assessment

In order to capture the full range and levels of competence, a variety of formal and informal continuous assessment situations is needed to give a complete picture of the learner's progress and achievements in all subjects. Continuous assessment must be clear, simple and manageable, and explicitly anchored in learner-centred principles and practice. Teachers must elicit reliable and valid information of the learner's performance in the basic competencies. The information gathered about the learners' progress and achievements should be used to give feedback to the learners about their strong and weak points, where they are doing well, and why, and where they need to try more, how, and why. The parents should be regularly informed about the progress of their child in all subjects, be encouraged to reward achievements, and given suggestions as to how they can support their learning activities.

The learner's progress and achievements in all subjects must be reported to parents on the school report.

11.2   Formative and summative assessment

The two modes of assessment used are formative continuous assessment and summative assessment. Formative continuous assessment is any assessment made during the school year in order to improve learning and to help shape and direct the teaching-learning process. Assessment has a formative role for learners if and when:
- it is used to motivate them to extend their knowledge and skills, establish sound values, and to promote healthy habits of study
- assessment tasks help learners to solve problems intelligently by using what they have learned
- the teacher uses the information to improve teaching methods and learning materials

Summative assessment is an assessment made at the end of the school year based on the accumulation of the progress and achievements of the learner throughout the year in a given subject, together with any end-of-year tests or examinations. The result of summative assessment is a single end-of-year promotion grade.

11.3   Informal and formal methods

The teacher must assess how well each learner masters the basic competencies described in the subject syllabuses and from this gain a picture of the all-round progress of the learner. To a large extent, this can be done in an informal way through structured observation of each learner's progress in learning and practice situations while they are investigating things, interpreting phenomena and data, applying knowledge, communicating, making value judgements, and in their participation in general.

When it is necessary to structure assessment more formally, the teacher should as far as possible use the same sort of situation as ordinary learning and practice situations to assess the competency of the learner. The use of formal written and oral tests can only assess a limited range of competencies and therefore should not take up a great deal of time. Short tests in any subject should be limited to part of a lesson and only exceptionally use up a whole lesson. End-of-term tests should only be written in the first lesson of the day, so that teaching and learning can continue normally for the rest of the time.

In Grade 10 a mock examination may be held to learn examination skills and to identify areas of the syllabus which may need extra attention. Mock examinations only serve a useful purpose if they are

used as a learning experience in how to organise oneself, how to read the paper, how to interpret and answer examination-type questions, and how to allocate time in an examination. This involves the teacher going through the paper systematically with the class when their answers are returned.

11.4 Evaluation

Information from informal and formal continuous assessment is to be used by the teacher to know where it is necessary to adapt methods and materials to the individual progress and needs of each learner. At the end of each main unit of teaching, and at the end of each term, the teacher together with the learners should evaluate the process in terms of tasks completed, participation, what the learners have learnt, and what can be done to improve the working atmosphere and achievements of the class.

11.5 Criterion-referenced grades

When grades are awarded in continuous assessment, it is essential that they reflect the learner's actual level of achievement in the Basic Competencies, and are not related to how well other learners are achieving or to the idea that a fixed percentage of the learners must always be awarded a Grade A, B, C, and so on (norm-referencing). In criterion-referenced assessment, each letter grade must have a descriptor for what the learner must demonstrate in order to be awarded the grade. Grade descriptors must be developed for each subject for each year. It is important that teachers in each department/section work together to have a shared understanding of what the grade descriptors mean, and how to apply them in continuous assessment, so that grades are awarded correctly and consistently across subjects. Only then will the assessment results be reliable.

11.6 Grade descriptors in the Junior Secondary Phase

In the Junior Secondary phase, grades A-G and U (ungraded) apply as follows:

Grades	Mark range	Grade descriptor
A	80%+	**Achieved Basic Competencies exceptionally well**. The learner is outstanding in all areas of competency.
B	70-79%	**Achieved Basic Competencies very well**. The learner is highly proficient in most areas of competency.
C	60-69%	**Achieved Basic Competencies well**.
D	50-59%	**Achieved Basic Competencies satisfactorily**.
E	40-49%	**Achieved a sufficient number of Basic Competencies** to exceed the minimum competency level.
F	30-39%	**Achieved the Basic Competencies needed to be considered competent**. The learner needs learning support.
G	20-29%	**Achieved the minimum number of Basic Competencies worthy of a grade**. The learner needs learning support
U	0-19%	**Did not achieve the minimum level of competence**. The learner needs learning support

11.7 Conducting and recording assessment

Continuous assessment should be planned and programmed at the beginning of the year, and kept as simple as possible. Marks given for class activities, practical activities, project work, assignments, homework, and short tests on completion of a topic may be recorded for continuous assessment. Non-promotional subjects in the Upper Primary and Secondary grades should be assessed through informal continuous assessment methods and letter grades awarded directly. These grades must be reported to the parents on the termly school report, but will not count for promotion purposes.

JSC Computer Studies Syllabus NIED 2012

11.8 Assessment Objectives

The three assessment objectives for Computer Studies are:

A. Knowledge with Understanding

Learners should be able to demonstrate knowledge with understanding about computing, in
relation to:
1. the range and scope of information processing applications;
2. the effects of the use of computers;
3. the range of equipment, tools and techniques used to solve problems;
4. the functions of the main hardware and software components of information processing
systems.

(Questions assessing these objectives will often begin with words such as:
name, identify, define, state).

B. Problem Solving and Realisation

Learners should be able to:
1. identify problems within the field of information processing;
2. analyse problems by considering relevant functional, practical, human and economic factors;
3. draw up specifications for the computer-based solutions of problems;
4. select from a range of resources those which are most suitable for solving problems;
5. develop solutions using appropriate methodologies;
6. implement solutions using equipment, tools and techniques sensibly;
7. test, evaluate and refine solutions systematically;
8. document problem solutions.

(Questions assessing these objectives will often begin with: explain, compare, write a
program/algorithm).

C. Application

Learners should be able to:
1. organise, interpret and present data to provide useful information;
2. recognise and present information in a variety of forms;
3. communicate in appropriate ways information about applications of computers, problems
and their solutions;
4. propose and describe using appropriate methods, ideas related to information processing and
problem solving.

(Questions assessing this objective will often begin with: name, explain/describe the use of ....).

11.9 Continuous Assessment: Detailed guidelines

Continuous assessment at Junior Secondary level consists of informal and more formal assessment. The
table in 11.9.2 specifies how formal assessments are required for assignments, projects and shorter tests,
in order to give an overall picture of the learner's knowledge and skills.

11.9.1 Types of continuous assessment

Project: A project is a longer assignment than a topic task and gives learners an opportunity to
complete an investigation into one of the themes/topics outlined in the syllabus. This type of
investigation will enable the teacher and learner to pursue a topic in greater depth and in a more lively
and creative way than possible with short discrete topic tasks. At least one project per trimester for the
first two trimesters.

Note: For Grade 10, the comprehensive project may be spread over the first two trimesters, e.g. the Word Processing part could be dealt with in the first trimester and the other in the second trimester. Marks will be allocated to each project. (See Annexure 1: Guide to assess projects)

Topic Tasks: These are activities that most teachers already use in their day to day teaching. These are recorded, assessed activities that could introduce a topic or be used during teaching of a topic and/or revision of a topic. They may include assessment involving competencies to do with locating information, conducting surveys, analysing information or presenting information. Topic task will involve assessment of basic competencies in all assessment objectives, however not all assessment objectives need to be present in every topic task. The greatest emphasis should be placed on assessment objectives B and C to meet the weighting shown in the Specification Grid on page 31.
At least two topic tasks per trimester and these marks should be converted to 25 marks when entered into the final mark sheet.
Note: Topics not covered in a project should be included in topic tasks.

Topic Tests: Completed topics should be ended off with a test indicating the achievements of the learners in these topics.

End of term test: Will be a comprehensive test of the whole term's work. No homework should be assigned during the time of writing end of term tests.

11.9.2 Summary of Continuous Assessment Tasks

CONTINUOUS ASSESSMENT GRADES 8 & 9						
	TERM 1		**TERM 2**		**TERM 3**	
COMPONENTS	**Number & Marks**	**Total**	**Number & Marks**	**Total**	**Number & Marks**	**Total**
Projects	1 x 40	40	1 x 40	40		
Topic Tasks	2x25	50	2x25	50	2x25	50
Topic Tests	2x15	30	2x15	30	2x15	30
End of Term Tests	1x30	30	1x30	30		
Term Marks		150		150		80
Weighted Term Marks		(150÷1.5) 100		(150÷1.5) 100		

CONTINUOUS ASSESSMENT GRADE 10				
COMPONENTS	**TERM 1**		**TERM 2**	
	Number & Marks	**Total**	**Number & Marks**	**Total**
Projects	1 x 40	40	1 x 40	40
Topic Tasks	2x25	50	2x25	50
Topic Tests	2x15	30	2x15	30
End of Term Tests	1x30	30	1x30	30
Term Marks		150		150
Weighted Term Marks		(150÷1.5) 100		(150÷1.5) 100

JSC Computer Studies Syllabus NIED 2012

11.10 End of year examinations: Detailed guidelines

In grades 8 and 9 there will be internal end-of-year examinations. As before, the purpose of these examinations is to focus on how well learners can demonstrate their thinking, communication, and problem-solving skills related to the areas of the syllabus which are most essential for continuing in the next grade. Preparing for, and conducting these examinations should not take up more than two weeks altogether right at the end of the year.

It is of utmost importance that learners are assessed on their knowledge of all the topics covered during the PHASE, not in that year. Thus grade 9 learners will write an examination based on work done in grade 8 and grade 9.

There will be an external examination at the end of Grade 10. The purpose of the examination is to assess how far each learner can demonstrate their achievement in reaching the competencies as a preparation for everyday life and for further studies or training, and to what extent the system as a whole is enabling learners to achieve optimally.

The aim of the papers is to be more practical. No question within a section should count more than 4 marks (but questions having sub-questions can count more than 4 marks). The learner should know how and why the computer is performing certain tasks. The description of the paper is shown below:

Written Examination Grade 8		
Description Of Questions	**Duration**	**Marks**
PAPER 1	1h 30 min	
SECTION A: Multiple choice (30 questions of 1 mark each) Differentiated questions on all topics		30
SECTION B: Question 1: 5 Definitions (2 marks each) covering the syllabus		10
Further questions: A variety of compulsory questions of variable mark value, which require answers of varying length and difficulty. The questions will be based on all sections of the syllabus in line with the assessment objectives. **At least one question** will assess learners on LOGO programming (10 marks).		90
		100
TOTAL		130

JSC Computer Studies Syllabus NIED 2012

Written Examination Grade 9		
Description Of Questions	**Duration**	**Marks**
PAPER 1	1h 30 min	
SECTION A: Multiple choice (30 questions of 1 mark each) Differentiated questions on all topics		30
SECTION B: Question 1: 5 Definitions (2 marks each) covering the syllabus		10
Further questions: A variety of compulsory questions of variable mark value, which require answers of varying length and difficulty. The questions will be based on all sections of the syllabus in line with the assessment objectives. **At least one question** will assess learners on trace tables and algorithms (20 marks).		90
TOTAL		130

Written Examination Grade 10		
Description Of Questions	**Duration**	**Marks**
PAPER 1	2h 15min	
SECTION A: Multiple choice (30 questions of 1 mark each) Differentiated questions on all topics		30
SECTION B: Question 1: 5 Definitions (2 marks each) covering the syllabus		10
Further questions: A variety of compulsory questions of variable mark value, which require answers of varying length and difficulty. The questions will be based on all sections of the syllabus in line with the assessment objectives. **At least one question** will assess learners on algorithms, trace tables and programming (30 marks). The remaining 60 marks should have the following weighting: Hardware and software / Operating systems: 10 marks; Application software: 25 marks; Structured questions relating to computer usage and its effects on society: 25 marks.		90
TOTAL		130

11.11 Promotion marks

In Grades 8-10, Continuous Assessment contributes 35% of the summative mark.

The weighting of each assessment component is as follows:

Component	Description	Marks	Weighting
End-of-year Examination	Section A	30	15%
	Section B	(100):	
	Definitions	10	5%
	Hardware and software Operating system	10	5%
	General application software	25	12.5%
	Structured questions relating to computer usage and its effects on society	25	12.5%
	Algorithm segments, trace table and problem solving	30	15%
Continuous Assessment	Projects	19	9.5%
	Topic Tasks	23	11.5%
	Topic Tests	14	7%
	End of Term Test	14	7%
	TOTAL MARKS	**200**	**100%**

JSC Computer Studies Syllabus NIED 2012

The promotion marks are calculated as follows:

PROMOTION MARK FOR GRADES 8 & 9				
	Term 1	**Term 2**	**Term 3**	**Total**
Term mark	150	150	80	380
CA mark	380÷38×7			70
End-of-year examination				130
Promotion Mark	200÷2			100

PROMOTION MARK FOR GRADE 10			
	Term 1	**Term 2**	**Total**
Term mark	150	150	300
CA mark	300÷30×7		70
End-of-year examination			130
Promotion Mark	200÷2		100

11.12 Specification Grids

The specification grids below indicate the mark weighting allocated to each objective for both Continuous Assessment and for the Written Examination.

		CONTINUOUS ASSESSMENT (%)			EXAMINATION (%)			TOTAL (%)		
		GR 8	**GR 9**	**GR 10**	**GR 8**	**GR 9**	**GR 10**	**GR 8**	**GR 9**	**GR 10**
A	Knowledge With Understanding	10	5	5	40	30	15	50	35	20
B	Problem Solving And Realisation	10	10	20	15	20	25	25	30	45
C	Application	15	20	10	10	15	25	25	35	35
Weighting		35%	35%	35%	65%	65%	65%	100%	100%	100%

JSC Computer Studies Syllabus NIED 2012

ANNEXE 1: Guide to Assess a Project

Grade 8 and 9

Program (Any two of the suggested 5)	Spelling Use of Spell checker	Font size - Important headings bigger	Fonts	Display - over whole page	Formatting Width, height	Formulae program	Total
Word Processing e.g. Menu Advertisement	4 4	8 8	2 2	6 6			20 x 2 = 40 20 x 2 = 40
Spreadsheet e.g. Mark sheet	2				8	10	20 x 2 = 40

Logo
e.g. proposed design
  -   tessalation
  -   relative design with variables
				8
				8
						12
						12
							20 x 2 = 40
							20 x 2 = 40

Grade 9 and 10

Program (Any two of the suggested topics per year)	Design layout	Spelling and grammar	Use of columns	Headings (font, alignment) use of symbols, Import files	Graphics, pictures, insert table	Page layout (displayed well over A4 sheet)	Background	Create tables	Create queries	Design layout	Use mail merge	Design the spreadsheet	Correctness of information	Formatting	Use formulae	Create a chart/graphs	Display of spreadsheet	Total
Word Processing e.g. Price list Newspaper article	10	5	5	5	10	5												40
Database e.g. School reports Sports club								15	15	5	5							40
Spreadsheet e.g. Tuck-shop Budget												4	4	10	10	10	2	40
Desktop Publishing e.g. Brochure Cards Certificates	15			5	15		5											40

Grade 10 (Comprehensive Project)

Possible course work: This schedule is for a comprehensive project which include documents created by different applications (This could be dealt with over two trimesters)	Fonts - Different fonts (2) - Different sizes(2) - Consistent & appropriate (2)	Formatting - Alignment (1) - Bold, Underline, Italics (2) - Bullets/numbering (2)	DTP (use of graphics)	Columns/Tables	Page numbering	Mail Merge	Word count & Spell check	Header/Footer (not page)	Different margins	Orientation	General impression	Design Layout - centre - heading - page layout	Sort (ascending /descending)	Formatting, e.g. bold, centred, cells, decimal values, currency, percentage	Filter & Auto fill	Use of formulae	Create charts	Design of Database	Create tables - type fields etc.	Create Queries	Different Views	Reports	TOTAL
WORD PROCESSING e.g. Create a document using Mail Merge.	6	5	3	3	2	7	2	3	2	2	5												40
SPREADSHEETS e.g. Budgets, Price lists, Score Cards, Mark sheet, Reports etc.												3	2	3	4	3	5						20
DATABASE e.g. Clients, Learners, Members																		5	5	5	3	2	20

Optional (for extra marks) Web page, Programming, Power Point presentation

41

Grade 10 (Programming)

Course work on programming	Identification of the problem: How well is the problem identified? (Not at all 0, vaguely 1, clearly 2)	Statement of specific objectives: How clearly stated are the specific objectives to be achieved? (Not stated 0, implicitly 1, explicitly 2)	Clarity of plan of action: How clear is the candidate's overall plan for the solution of the problem? (No plan 0, difficult to follow 1, clear 2)	Use of separate modules: Are separate modules easy to distinguish and connect? (No stages 0, confused 1, clear 2)	Clarity of Algorithms: How clear are the algorithms for each stage? (No algorithms 0, confused 1, clear but incomplete 2, clear 3)	Explanation of need for hardware: Is the need for each piece of hardware related to the information requirements of the solution? (No connection 0, vaguely 1, clearly but incomplete 2, well 3)	Plausibility of Algorithms: How plausible are the algorithms? (No logic 0, most fail 1, most work 2)	Appropriateness of tools and techniques: Have appropriate tools and techniques been employed?	Simplicity of user documentation: How well could a novice use the solution by following the instructions provided? (No instructions 0, with difficulty 1, easily 2)	Usefulness of sample runs: How useful are the sample runs provided? (None provided 0, a little use 1, very useful 2)	Candidate's evaluation of the solution: How sound is the candidate's solution? (None offered 0, fanciful or inaccurate 1, reasonable 2)	Technical skill: What level of technical skill and mastery is shown in the use of software or programming? (None 0, weak 1-4, competent 5-8, high level 9-13)	Testing of standard data: How good is the testing of standard data? (Not done 0, one or both weak 1, one thorough 2)	Total
PROGRAMMING Studies should include the following: 1. Procedures 2. Repetition structures 3. Decision structures	2	2	2	2	3	3	2	3	2	2	2	13	2	40

42

ANNEXE 2: Assessment Record Sheet for Grades 8 and 9

| ASSESSMENT RECORD SHEET COMPUTER STUDIES | | Grade: .... | | Year: .... |

| School: .... | | Teacher: .... |

Name of Learner	Term	Project	Topic Task		Topic Test		End of Term Test		Term Mark	Weighted Term Mark (150÷1.5)	Total of Term Marks	CA Mark (380÷38×7)	End-of-year Examination	Promotion Mark (200÷2)
		40	25	25	15	15	30	150	80	100	380	70	130	100
	1													
	2													
	3													
	1													
	2													
	3													
	1													
	2													
	3													
	1													
	2													
	3													
	1													
	2													
	3													

JSC Computer Studies Syllabus NIED 2012

ANNEXE 3: Assessment Record Sheet for Grade 10

| ASSESSMENT RECORD SHEET COMPUTER STUDIES | | | | | | | | | | | | Grade: .... | | Year: .... |
| School: .... | | | | | | | | | | | | Teacher: .... | | |

Name of Learner	Term	Project	Topic Task		Topic Test		End of Term Test	Term Mark	Weighted Term Mark (150÷1.5)	Total of Term Marks	CA Mark (300÷30×7)
		40	25	25	15	15	30	150	100	300	70
	1										
	2										
	1										
	2										
	1										
	2										
	1										
	2										
	1										
	2										
	1										
	2										
	1										
	2										

44

JSC Computer Studies Syllabus NIED 2012