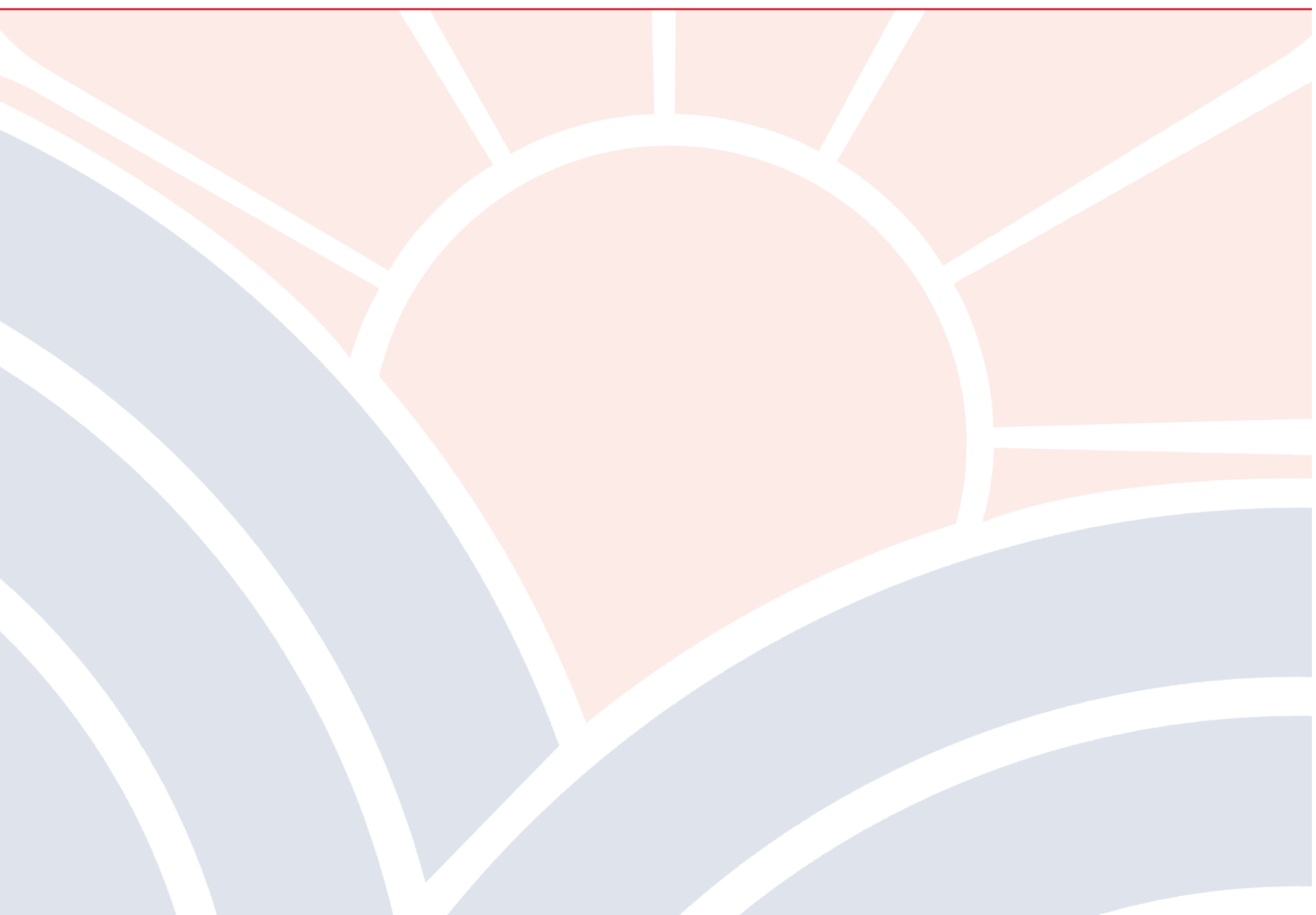


Programme Specification

HNC Aeronautical Engineering



Programme Specification

Title of Programme: HNC Aeronautical Engineering

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

- | | |
|---|---|
| 1. Awarding Body | Pearson BTEC |
| 2. Teaching location | Woodlands Campus, Solihull College |
| 3. Accreditation details | N/A |
| 4. Final award | Higher National Certificate |
| 5. Name of award | Pearson BTEC Level 5 HNC Diploma Aeronautical Engineering |
| 6. Codes | |
| a. UCAS code | N/A |
| b. Solihull Qualification Code | ENENA041 |
| c. Edexcel Programme Code (& approval dates) | 500/8991/2 10 th October 2008 |
| 7. QAA Subject Benchmark or other external reference such as published by Edexcel if the course is a Higher National | Engineering 2015 Subject Benchmark |
| 8. Date this specification applies from | 01.09.2015 |

Approved

Mick Nicholl

Head of School – Engineering & Construction

9. Educational Aims of the Programme

This programme aims to:

- Equip individuals with knowledge, understanding and skills for success in employment in the Aerospace engineering and related sectors.
- Enable progression to an undergraduate degree or further professional qualification in Aerospace engineering or related areas.
- Provide opportunities for specialist study relevant to individual vocations and contexts.
- Develop the individual's ability to make an immediate contribution to employment in the Aerospace engineering sector, through effective use and combination of the knowledge and skills gained in different parts of the programme.
- Develop a range of skills and techniques, personal qualities and attributes essential for successful performance in working life and thereby enabling learners to make an immediate contribution to employment.
- Provide education and training for a range of careers in the Aerospace Engineering sector.
- Provide opportunities for learners to gain a nationally-recognised vocationally-specific qualification to enter employment in the sector or progress to higher education qualifications such as a fulltime degree in a related area.
- Present opportunities for learners to focus on the development of the higher level skills in Aerospace engineering and related areas.
- Provide opportunities for learners to develop a range of skills and techniques and attributes essential for successful performance in working life.
- Assist in the development of learners' knowledge, understanding and skills in the field of Aerospace Engineering.

10. Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

Subject knowledge and critical understanding includes:

A sound basic knowledge and understanding that includes:

- Analytical methods relevant to Aerospace Engineering such as differentiation and integration relating to aerodynamics.
- Engineering practice (including codes of practice, regulatory frameworks and requirements for safe operation). This is developed in visits to industrial sites and work placement.
- Scientific principles underpinning the specific engineering discipline such as energy transfer systems i.e. heat transfer through lagged pipe work system and power transmission in machinery
- Application of computers for quantitative analysis, simulation and solution of engineering problems and the manipulation and presentation of engineering Information, such as the use of VisSim and Flight Simulator.
- General principles and techniques of design and the characteristics of basic engineering materials and components
- Management and business practices

Higher level academic/ intellectual skills including ability to:

- Plan, conduct and report a programme of research
- Analyse and solve engineering problems
- Design a system, component or process to meet a need
- Be creative in the solution of problems and in the development of designs
- Evaluate design, processes and products, and make improvements.
- Integrate and evaluate information and data from a variety of sources.
- Use of commercial software to solve engineering problems

Higher practical and professional skills including the ability to:

- Plan and execute safely a series of experiments.
- Use laboratory equipment and software packages to generate data
- Design a system, component or process to meet a need.
- Be creative in the solution of problems and in the development of designs.
- Evaluate design processes and products and make improvements
- Integrate and evaluate information and data from a variety of sources.
- Produce a design for a system, component or process to meet specified requirements, such as CAD/CAM, Design and Project
- Research and undertake tests for a design solution and report the results effectively, such as design and materials engineering

- Cognitive skills of critical thinking, analysis and synthesis
- Effective problem solving and decision making using appropriate quantitative and qualitative skills including identifying, formulating and solving problems
- Effective communication skills, both oral and written, using a range of media widely used in the sector, e.g. the preparation and presentation of reports
- Numeric and quantitative skills including data analysis, interpretation and extrapolation
- Effective use of communication and information technology for aerospace related areas.
- Effective self-management in terms of time, planning and behaviour motivation, self-starting and individual initiative.
- Developing an appropriate learning style.
- Effective performance within a team environment including leadership, team building, influencing and project management skills
- Interpersonal skills, e.g. effective listening, negotiating, persuading and presentation

Higher Level transferable skills development including:

- The ability to manage and develop self
- The ability to communicate ideas effectively both orally and in writing
- The ability to apply numeracy in an aerospace engineering context
- The ability to apply technology in an aerospace engineering context
- To manage tasks and solve problems
- Apply design and creativity to solving an array of aerospace engineering problems
- The ability to work effectively as an individual and as part of a team
- The ability to be flexible and respond to the change within the aerospace engineering sector
- Designing, planning, conducting and reporting on the needs of the aerospace engineering sector.
- The ability to use ICT and Management Information Systems in an aerospace engineering setting.
- Read and use appropriate literature with a full and critical understanding
- Solve problems applying subject knowledge and understanding to address familiar and unfamiliar problems within an aerospace engineering context.
- Think scientifically, statistically and logically in relevant contexts.
- Think independently and take responsibility for their own learning whilst recognising their learning style

Teaching and Learning Methods

The following opportunities are provided to enable learners to develop and demonstrate their achievement of learning outcomes:

- Acquisition of core knowledge is through a mixture of lecture/presentations/demonstrations, tutorials, group seminars and directed study
- Analytic thinking skills are developed through discussion and debate in-group and tutorial sessions and question sheets.
- Practical skills are an essential component of the programme and will involve group work, presentations, demonstrations, laboratory experiments,
- Common skills such as oral and written communication are developed by means of course notes, presentations of project work, appropriate reading, and written tutor feedback.
- Design skills and the ability to create simple engineering designs using multi-disciplinary approach is developed by means of sample project work and the final year team projects.
- The global hours for this programme are 420 hours per year including tutorial.

Assessment methods

Summative assessment methods include:

- Written work required in various formats such as reports, essays, blogs, dissertation
- Oral presentations to a group audience using teaching aids such as PowerPoint, poster, Electronic Whiteboard, Practical Models.
- Assessment is enhanced by encouraging the students to use technology e.g. digital cameras, flip videos, analysis software to augment their presentational work.
- Project work.
- Small scale research studies
- Work-based learning

As far as possible all assignment work is connected to a vocational relevant scenario. Students receive individual written and oral feedback within 2 weeks of submission date.

Formative assessment for learning and feedback includes:

- Interactive lectures and question & answer sessions can be used to examine student understanding and identify any additional guidance required.
- Group activities involve students actively contributing to, leading and participating in discussions and debates on a wide range of subject areas, undertaking games or group activities allowing immediate assessment and feedback.
- Subject related tutorials are led by the subject tutor and aim to address a particular module or assignment. These tutorials can be linked to workshop sessions where necessary.
- Workshops are for students to develop skills in self-directed study with the support of tutors. These sessions will be supported by staff but not staff led. There will also be self-directed time for students to further develop these skills and spend time reading around topics using a variety of recommended sources.
- Extension activities/quizzes/Discussion forums on Moodle.

- Presentations are used to support research skills, organisation, time-management skill and are also a confidence-building tool.
- The need for IT support in general will be identified and where necessary, IT support will be organised.
- Diagnostic testing identifying Maths and English support where necessary.

11. Programme Structure

Module code	Module title	CATS Credit value	Level	Year
Unit 1: A/601/1401	Analytical Methods for Engineers	15	4	1
Unit 2: L/601/1404	Engineering Science	15	4	1
Unit 3: L/601/0995	Project Design, Implementation and Evaluation	20	5	2
Unit 6: A/601/1463	Health, Safety and Risk Assessment in Engineering	15	4	1
Unit 20: A/601/1558	Quality and Business Improvement	15	5	2
Unit 21: F/601/1626	Materials Engineering	15	4	2
Unit 83: H/601/7189	Aerodynamic Principles and Aircraft Design	15	4	2
Unit 89: J/601/7248	Aircraft Structural Integrity	15	5	1
Unit 92: J/601/7251	Aircraft Gas Turbine Science	15	5	1

Progression to Year 2

Progression onto the second year of the programme normally requires the completion of all 1st year units

Completion of the Award

All units studied must be completed with a minimum grade of a Pass in order to complete the award.

Module Descriptors

Unit 1: A/601/1401 Analytical Methods for Engineers

This unit will provide the analytical knowledge and techniques needed to carry out a range of engineering tasks and will provide a base for further study of engineering mathematics

Unit 2: L/601/1404 Engineering Science

This unit aims to provide learners with an understanding of the mechanical and electrical principles that underpin mechanical and electrically focused engineering systems.

Unit 3: L/601/0995 Project Design, Implementation and Evaluation

To develop learners' skills of independent enquiry by undertaking a sustained investigation of direct relevance to their vocational, academic and professional development.

Unit 6: A/601/1463 Health, Safety and Risk Assessment in Engineering

This unit aims to provide learners with an understanding of health and safety planning, implementation and legislation within an engineering environment.

Unit 20: A/601/1558 Quality and Business Improvement

This unit will provide learners with the necessary background knowledge and understanding of the properties, selection, processing and failure of engineering materials

Unit 21: F/601/1626 Materials Engineering

This unit will provide learners with the necessary background knowledge and understanding of the properties, selection, processing and failure of engineering materials.

Unit 83: H/601/7189 Aerodynamic Principles and Aircraft Design

This unit will develop learners' understanding of how aerodynamic principles influence aircraft design.

Unit 89: J/6017248 Aircraft Structural Integrity

This unit aims to develop the understanding and techniques necessary to ensure that aircraft are manufactured and maintained in such a manner that the integrity of their structure is assured

Unit 92: J/601/7251 Aircraft Gas Turbine Science

This unit will develop learners' understanding of the principles of aircraft gas turbine technology and their application in gas turbine engine modules and systems

12. Support for Students and Their Learning

Student progression on course is supported both by subject tutors and central College services and includes:

- An induction programme introducing new students to the subject of study, higher level skills that need to be developed, and the college facilities (including the library, IT facilities, staff and other students).
- College and course/ module handbooks available in print and electronic format on Moodle.
- Personal and academic support is integrated in teaching provided by supportive and accessible tutors and identified 1:1 support sessions are also available.
- A modern well-equipped library and Up-to-date ICT equipment.
- Study skills sessions integrated in programme.
- Personal development planning sessions integrated into programme
- Up-to-date Computer laboratories with specialist facilities for computer networking and multimedia computing.
- Various workshops including wind tunnel and flight simulator
- Study skills sessions integrated in programme and organised on a regular basis;
- High specification computers with latest educational software.
- Planned visits and speakers
- Access to counsellors and support for students with special needs.
- Written assignment / assessment feedback (normally provided with 2 weeks of assessment submission).
- Regular 1:1 and group tutorial support
- Access to regularly updated course section and college wide sections on the college's intranet Moodle

13. Criteria for Admission

Normally, the course enrolls students who have reached the minimum age of 18.

Students should have at least:
Entry Requirements:

4 GCSEs grade C or above, plus

Full-time Entry

1 A-level (80 UCAS Points)

Diploma in Engineering (PP)

Students with existing level 4/5 qualifications may be eligible for some accreditation for prior learning which can be discussed on an individual basis.

Mature students, over the age of 21, with a suitable background or experience may be accepted without formal qualifications.

All students will be invited to interview before an offer is made.

14. Progression

It may be possible to progress onto a HND Aeronautical Engineering programme at Solihull College.

Previous graduates from the HND Aeronautical Engineering programme have successfully progressed to degree level courses at Coventry University, Loughborough University, Sheffield University and Farnborough College.

With a HND, it may be possible to join the second year of a degree programme or be accepted onto a top-up BSc if available at the institution. With a HNC, it may be possible to join the first year of a degree programme.

15. Evaluating the Quality of Teaching and Learning

Evaluation of the Standards of Teaching and Learning is undertaken using the results of the following documents;

- Student feedback questionnaires, both initial impressions and the spring survey
- Module review forms completed by students at the end of every module and summarised by the course leader.
- Student input to the Programme Quality Board held twice a year.
- Student representations made through the HE Student Council.
- Action areas fed by the above to the course based Annual Monitoring report.
- Findings of the peer teaching observation scheme and recommendations for improvement that are made
- Quality Audit of the programme undertaken by Director of HE and an external observer.
- External Verifiers report and audit of assessed work

Students have the opportunity to comment on the quality of the programme in the following ways

- Submitting module evaluation questionnaires which are shared in team meetings and relevant actions raised are included in the Annual Monitoring Review.
- Student Representatives volunteer from each group to bring forward the views of their colleagues informally and within bi-annual programme quality boards (PQB). The minutes of student meetings are placed on Moodle and actions are reviewed at each PQB.

The ways in which the quality of this programme is checked, both inside and outside the college, are:

- External Examiners, who produce an annual report which is available to view on Moodle and also results in an action plan for the following academic year.
- Annual module review in the form of student evaluations which are discussed in a team meeting
- Periodic programme review to identify best practice and invite employers to contribute to the design of the programmes
- Invitation to attend Programme Quality Boards to all students and create a transparent discussion to share ideas, best practice and areas for improvement.

16. Regulation of Assessment

- The programme is the subject of an Annual Monitoring Report (AMR) the last section of which is a Quality Improvement Plan (QIP), written by the course leader with help and input from the teaching and tutoring team this is passed to the Head of School for audit and from them to the quality unit for further audit and acceptance as part of the College plan.
- Assessment rules and regulations and quality standards are those that are laid down in the Quality standards requirements of the College Academic Board.
- Assessment and assessment vehicles are regulated by the internal verification system for each programme which is itself audited by the quality unit within the College and also by the External Verifier appointed by Edexcel.
- External verification of assessment and of the provision and standards of teaching are regulated by Pearson BTEC and their quality unit, the programme has to seek approval for continuance every 5 years. Their requirements are monitored annually by the visit and report of their appointed external verifier (Standards Verifier)
- Also the programme is the subject of periodic review by QAA, ensuring that national benchmarks are met throughout the programme.

Standards Verifiers (External Examiners) are appointed by the Pearson

The role of Standards Verifier is that of moderator. In order to do this they check and review:

- action points from previous reports
- Centre assessment policy and boards
- effectiveness of assignments and internal verification
- the maintenance and audit of assessment records
- student registration and certification claims
- student support and review
- areas of good practice

17. Enhancement

- An action plan is provided in each annual programme report and progress in achieving enhancements is regularly reviewed
- Good practice in teaching and learning is developed and disseminated through regular staff development workshops and through participation in internal verification of completed student work.
- Staff development activities are discussed at annual appraisal interviews and are actively encouraged to develop their professional practice and industrial experience.

18. Programme Resources

Advanced Manufacturing Centre
Aircraft Workshop
Materials Testing Laboratory
NASA Software for Simulation
Electronic Simulation Software
CAD Software

These resources will be updated once the Aviation Academy has been established.

Student Employability

This programme is part of Solihull College's commitment to meeting the needs of local, national and international employers by delivering a diverse range of educational models including part-time and work-based study for learners drawn from non-traditional backgrounds in addition to internal progressions from FE vocational programmes.

As part of this commitment, the HNC Aeronautical Engineering will:

1. Support students by providing professional, impartial advice and guidance to enable students to make considered career decisions before and during their studies to enable them to be prepared for their future employment and development by:
 1. identifying the skills needed for progression into employment,
 2. enhancing their existing employment prospects.
2. Provide subject-related resources and information on local, national and international labour markets;
3. Be responsive to the needs of employers in order to maximise students' employability and career progression prospects;
4. Include study skills which will improve students' academic writing and research capabilities to enable further study and facilitate career progression;
5. Support equality and diversity, and minimise barriers to learning, as described in the college's Equality Policy which can be found on the website under Mission and Policies.
6. Ensure that employers play a key part in module content, course design and assessment criteria by formally seeking their views through individual employer meetings and meetings with industry groups, and the use of a specialist employer service researcher to help to ensure that the course content meets industry expectations and requirements;
7. Professional Body recognition - successful completion of the HNC enables students to apply to become an Associate Member of Royal Aeronautical Society.

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook or [online](#).

Document History

1. 05.05.15
- 2.
- 3.

Programme Leader

Rosa Wells

Web address

<http://solihull.devclever.net/courses/aeronautical-engineering-hnc-diploma/>

Date checked against public information

03.05.15

Specification Author

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