University of the West of Scotland

Undergraduate Programme Specification

Session: 2023/24

Last modified: 19/04/2023 22:07:55

Status: Proposal

Named Award Title:	**BEng (Hons) Aircraft Engineering Single**

Award Title for Each Award:	**BEng (Hons) Aircraft Engineering** **BEng /BSc Aircraft Engineering** **Dip HE Engineering** **Cert HE Engineering Science**

Date of Validation:	March 2019
Details of Cohorts Applies to:	All cohorts entering from Sept ~~22~~23 onwards

Awarding Institution/Body:	University of the West of Scotland
Teaching Institution:	University of the West of Scotland
Language of Instruction & Examination:	English
Award Accredited By:	Institution of Mechanical Engineers
Maximum Period of Registration:	5 Years Full Time
Mode of Study:	Full Time Part Time
Campus:	Paisley

School:	School of Computing, Engineering and Physical Sciences
Programme Board	Engineering
Programme Leader:	Dr Bassam Rakhshani

Admission Criteria

Candidates must be able to satisfy the general admission requirements of the University of the West of Scotland as specified in Chapter 2 of the University Regulatory Framework together with the following programme requirements:

SQA National Qualifications

Standard Entry Requirements: ABBB (114 UCAS Tariff points) including Mathematics, plus SQA National 5 (Grade B, or above) / Intermediate 2 (Grade B, or above) / Standard Grade (Credit) Physics

or GCE

BBC (112 UCAS Tariff points) including Mathematics and Physics

or SQA National Qualifications/Edexcel Foundation

An appropriate HNC/HND award with the level of entry and/or credit awarded being subject to the content of the HN programme.

Other Required Qualifications/Experience

Applicants may also be considered with other academic, vocational or professional qualifications deemed to be equivalent. We welcome applications from international students with equivalency of qualifications. Scholarships may be available on application.

Further desirable skills pre-application

General Overview

Graduates from the BEng (Hons) Aircraft Engineering programme will have an ability to, and focus on developing solutions for aircraft engineering and broader engineering problems using new or existing technologies, through innovation, creativity and change.

Graduates will possess the following defining charateristics. A coherent body of knowledge including mathematics, natural science and engineering principles, and a proven ability to apply that knowledge to analyse and solve complex aircraft and broader engineering problems. Some of the knowledge will be at the forefront aircraft engineering. Graduates will be able to select and apply quantitative and computational analysis techniques, recognising the limitations of the methods employed. They will have an appreciation of professional engineering practice and ethics, graduates will be commercially aware and be able to apply their knowledge and skills to design and deliver new products or services to meet defined needs using new or existing technologies.

The BEng (Hons) Aircraft Engineering programme is contextually aligned with the Engineering Council's AHEP4 Learning Outcomes as oulined below.

C1- Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study.

C2- Analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

C3- Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed.

C4- Select and evaluate technical literature and other sources of information to address complex problems

C5- Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.

C6- Apply an integrated or systems approach to the solution of complex problems

C7- Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts

C8- Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

C9- Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.

C10- Adopt a holistic and proportionate approach to the mitigation of security risks.

C11- Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.

C12- Use practical laboratory and workshop skills to investigate complex problems.

C13-Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.

C14- Discuss the role of quality management systems and continuous improvement in the context of complex problems.

C15- Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.

C16- Function effectively as an individual, and as a member or leader of a team

C17- Communicate effectively on complex engineering matters with technical and non-technical audiences

C18- Plan and record self-learning and development as the foundation for lifelong learning/CPD

General Overview of Programme

Graduates from this programme are equipped to enter careers in a variety of aircraft engineering sectors or to progress to further study. Graduates from this programme should find employment in the local, national and international aerospace industry and wider engineering sectors.

The teaching and learning methods employed by staff in the delivery of the module portfolio covers a wide range of established and some novel approaches. Lectures and tutorials form the basis for much of the teaching within engineering but ‘flipped’ classroom and online content, video recording of sessions is now found in all modules.

Extensive use is also made of laboratories, seminars, group work, independent learning and demonstrations. Synoptic learning is undertaken in a number of modules within the same level replicating how engineering problems are addressed within industry. One of the main objectives in this area is to keep teaching materials as interesting and as relevant as possible to ensure student enthusiasm for the subjects being presented. Staff make full use of all technologies when delivering material to students including high quality notes, use of multimedia presentations and use of the internet/electronic technology.

The Engineering group has a policy of using small tutorial groups in key subject areas and either sub-divides cohorts into small groups or increase staff numbers in classes or laboratories. All modules are taught by subject experts with staff making use of materials and topics raised through their professional activities whether prior industrial experience, research KTP, and/or consultancy based. Many case studies and examples of applications are taken from live industrial situations. The School of Computing, Engineering and Physical Sciences has always taken a lead in the use of IT to either deliver material or to supplement and reinforce the traditional teaching and learning approaches. At the Paisley Campus Engineering has its own extensive networks to support all of the area's activity. Students have access to 100+ high specification PC workstations in state of the art air- conditioned laboratories dedicated specifically for Engineering students. Indeed, all modules are now supported electronically, providing notes, copies of lectures, models, sample simulations etc. A VLE (Virtual Learning Environment) is used by all staff as both a repository for material and a social learning platform and is used for online formative and summative assessment, assessment submissions and discussion forums. A variety of assessment methods are used throughout programmes. These range from class tests, laboratory reports, design assignments, individual and group presentations and formal open-book examinations. Both group project work and individual project work are incorporated into the curriculum so that students develop the learning skills associated with group and independent working as well as giving presentations on their work. Formative feedback and constructive comments are given to the student on their coursework submissions. Anonymous marking is undertaken, where possible. Mixtures of formative and summative methods are used in the assessment of student performance within the group. It is recognised that while most of the assessments are summative in nature formative assessment is also found in all modules, delivering timely and regular feedback.

The programme and programme specification has been reviewed and updated taking cognisance of the University's Curriculum Framework principles as discussed below.

Student Centred
Reflection on learning is inherent and credit bearing in all years of the programme.
Advanced entry to the programme is available where RPL/CPD/informal learning is evidenced.
Access to student support (programme team, peers and wider University student services) is promoted at induction, through personal tutoring/year/programme leader, group activity in all levels of the programme, SCQF Level appropriate employability and careers sessions and within modules evident in entry level of the programme.
Engagement and progress is monitored by module coordinators, this takes the form of VLE analytics, assessment engagement, on-campus activity engagement and formative and summative assessment engagement. Monthly meetings with year leads and programme leads allows the programme teams to respond appropriately and quickly both from a student and programme learning, teaching and assessment perspective.
Co-creation of curriculum is challenging due to the need to demonstrate that Engineering Council learning outcomes are met by all students. However, within a number of modules students can determine the direction of their learning with boundaries set to ensure the assessment is fit for purpose. [1]

Programme Delivery
Delivery of the programme is on-campus lectures, tutorials, laboratory and group work activity. The timetables are produced to ensure on-campus learning time is efficiently maximised.

Simple and Coherent
The programme has multiple exit award points as demonstrated in the programme specification and students are supported/counselled appropriately by the programme leader after examiners' panels.
Programme teams are aware of the programme learning outcomes through ongoing programme development meetings. The importance of the modular outcomes and assessment approaches on the overall programme outcomes and Engineering Council's learning outcomes, student feedback and sustainability are core to the discussions at these meetings. Students are made aware of the programme learning outcomes at induction, module introductions and programme development workshops. A capstone module is present at L10- Final Year Project.
Assessment, wherever possible, follows real-world activities examination is required as part of the accreditation requirements however this follows an open-book approach providing time-bound, individually assessed, unfamiliar problems- assessing content and developing a number of important meta-skills. All modules have inherent tutorial activity with formative assessment providing concurrent feedback allowing implementable feed-forward.
Academic accreditation is the mark of assurance that individual engineering programmes within higher education meet the required overall standards set by the engineering profession and defined by the Engineering Council (EngC). The programme prepares students for a career in engineering and the content is guided and evaluated by the Engineering Councils Standard for Professional Engineering Competence and Commitment.
Meta-skills are embedded in the programme as is required by the Engineering Council and these include digital skills, creativity, critical thinking, innovation, and entrepreneurship and social enterprise.
Students are assessed in a variety of ways and settings including, practical, written, oral, time-bound, group, real-world environment, creative, critical thinking and this broad approach to assessment provides a number of transferrable skills to be developed whilst assessing.

Inclusivity
The programme team have reviewed the content of the AdvanceHE Anti-Racist Curriculum Project [2] and are aware that in this regard 'curricular reform is a continual process rather than a final destination'. With this in mind, further

institutional guidance is welcomed to ensure that every effort has been made to safeguard that the curriculum is and will continue to be anti-racist and inclusive for all.

Sustainability
Wherever possible modules are shared with other engineering programmes to maximise efficiency with specific programme contextualised components of learning, teaching and assessment. All modules have been reviewed to ensure they meet the norms around contact hours.

[1]- https://www.uws.ac.uk/media/8142/assessment-handbook-2021-22.pdf

[2]- https://www.advance-he.ac.uk/anti-racist-curriculum-project

Graduate Attributes, Employability & Personal Development Planning

Graduate Attributes
UWS' Graduate Attributes focus on academic, personal and professional skills and throughout the programmes that these skills develop graduates who are universally prepared, work-ready and successful. The Aircraft Engineering programme provides opportunities throughout the levels to enable these skills to be developed and focussed appropriately.
Aircraft Engineering knowledge is assembled throughout the programme and wherever possible digital literacy skills and ability to provide effective solutions is enhanced utilising industry standard appropriate technologies such as MATLAB, MATHCAD, CAD, FEA and CFD software.
Particularly, but not exclusively, in later years of the programme, critical analytical and inquiry skills are developed and used to solve industry related problems. Many of these are set in and constrained by consideration of aerospace regulatory body design specifications such as CS25.
Aerodynamic and structures design and analysis exercises are utilised where incisive and innovative solutions are required to be effectively presented as part of collaborative groups or as individual autonomous learning activities.
The programme promotes cultural awareness and emotional intelligence with a variety of group exercises developing resilient, ambitious and enterprising leadership qualities whilst ensuring that group members are emotionally and culturally aware and respectful communication and behaviours are the norm.
Commercial awareness is linked to aircraft design activities during the programme ensuring that costs associated with staff, materials, manufacture, in-service and decommissioning are considered when developing transformational/innovative solutions with commercial potential.
Ethical awareness and social responsibility is developed throughout and is formalised in final year project studies where School/University ethical approval is sought if required.
Links to current University and programme research are promoted through the programme with opportunities for students to become involved in aspects of the research from the earliest opportunity either discretely or as part of an assessment.

Employability

The local aerospace market contains a number of international companies such as BAE Systems, Spirit AeroSystems United Technologies, British Airways, Woodward etc and the programme has been developed with feedback from those local companies. Such is the diversity of the work these companies undertake the skills the graduates gain from undertaking the programme are internationally transferrable.

The majority of the final year projects are offered in collaboration with these partner industries and this in tandem with short term placements at the end of third year with many of the local companies is providing graduate employment opportunites at the end of the students' studies.

The programe is also organised to allow part time entry allowing those in employment to undetake degree award on a day release manner and thereby supporting employers to increase qualification levels of their employees manageably.

Personal Development Planning

Across the programme of study, the Personal Development Planning (PDP) process gives the opportunity for engagement of students with a set of core activities, which include

- reflection on prior experience, personal attributes and goals;
- audits of skills and feedback on their development;
- opportunities and guidance on the recording of achievements;
- the identification/development of learning goals;
- opportunities to reflect on this material and to gain feedback;
- opportunities (and guidance) on presentation of evidence for different audiences and planning of future
- learning and career development (such as CVs);
- maintaining an effective PDP record.

Work Based Learning/Placement Details

A number of local employers are offering short term unpaid placements at the end of year 3 and this is leading to further opportunities for paid internships at the end of year 4.

Engagement

In line with the Academic Engagement Procedure, Students are defined as academically engaged if they are regularly engaged with timetabled teaching sessions, course-related learning resources including those in the Library and on the relevant learning platform, and complete assessments and submit these on time.

Where a programme has Professional, Statutory or Regulatory Body requirements these will be listed here:

Students are expected to attend all timetabled sessions and to engage with all formative and summative assessment elements of all the modules that are included in the programme specification as core modules as well as any optional module when applicable.

Equality and Diversity

The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: UWS Equality and Diversity Policy

Aligned with the University's commitment to equality and diversity, this module supports equality of opportunity for students from all backgrounds and learning needs. Using the VLE, material will presented electronically in formats that allow flexible access and manipulation of content. This module complies with University regulations and guidance on inclusive learning and teaching practice. Specialist assistive equipment, support provision and adjustment to assessment practice in accordance with the University's policies and regulations. More information on the University's EDI policies can be accessed at: https://www.uws.ac.uk/about-uws/uws-commitments/equality-diversity-inclusion/ (N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School).

Programme structures and requirements, SCQF level, term, module name and code, credits and awards (Chapter 1, Regulatory Framework)

A. Learning Outcomes (Maximum of 5 per heading)

Outcomes should incorporate those applicable in the relevant QAA Benchmark statements

Knowledge and Understanding	
A1	Demonstrate and application of knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex aircraft and broader engineering problems. Some of the knowledge will be at the forefront of the particular subject of study.
A2	Demonstrate a basic knowledge and understanding of introductory principles and contexts with respect to multi-disciplinary aspects of aircraft engineering.
A3	Demonstrate knowledge and understanding of the relevant materials, equipment and processes and technologies underpinning aircraft design.
A4	Demonstrate an understanding of the commercial context and sustainability of aircraft engineering activities.
Practice - Applied Knowledge and Understanding	
B1	Demonstrate the analysis of complex aircraft engineering problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.
B2	Use practical laboratory and workshop skills to investigate complex problems.
B3	Select and evaluate technical literature and other sources of information to address complex problems.
B4	Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed.
B5	Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts.
Communication, ICT and Numeracy Skills	
C1	Develop an appropriate range of transferable skills in communication, the use of IT facilities and information retrieval.

C2	Use computer software relevant to aircraft engineering.
C3	Adopt a holistic and proportionate approach to the mitigation of security risks.
C4	Communicate effectively on complex engineering matters with technical and non-technical audiences.
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Apply appropriate quantitative science and engineering tools to basic problems.
D2	Develop an appropriate range of transferable skills and apply these in problem solving.
D3	Apply an integrated or systems approach to the solution of complex problems.
Autonomy, Accountability and Working With Others	
E1	Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.
E2	Function effectively as an individual, and as a member or leader of a team.
E3	Develop skills in planning self-learning and improving performance, as the foundation for PDP, lifelong learning and CPD.
E4	Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

Core Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
7	ENGG07002	Applied Engineering Science	20	✓	✓		
7	ENGG07004	Technical Communications	20	✓			
7	ENGG07011	Aircraft Aerodynamics, Structures and Systems	20	✓			
7		Mathematics for Engineering 1 *	20	✓	✓		
7	ENGG07001	Engineering Mechanics	20		✓		
7	ENGG07016	Programming for Engineers	20		✓		

* Indicates that module descriptor is not published.

Footnotes

Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	

* Indicates that module descriptor is not published.

Footnotes

Criteria for Progression and Award

To progress from SCQF 7 to SCQF 8 in this programme, students are normally required to obtain 120 credits from the above programme.

Refer to Regulatory Framework 3.13 regarding progression with credit deficit.

Students obtaining 120 credits at SCQF 7 or above, with 100 from the programme are eligible for the exit award of the Certificate of Higher Education in Engineering Science.

All pre-requisite modules must be passed before progression is allowed.

B. Learning Outcomes (Maximum of 5 per heading)

Outcomes should incorporate those applicable in the relevant QAA Benchmark statements

Knowledge and Understanding	
A1	Demonstrate and apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study.
A2	Demonstrate an extended knowledge of the different types and characteristics of engineering materials and manufacturing processes.
A3	Discuss the role of quality management systems and continuous improvement in the context of complex problems.
A4	Demonstrate an understanding of the environmental and societal impact of solutions to complex problems and minimise adverse impacts.
A5	
Practice - Applied Knowledge and Understanding	
B1	Demonstrate the analysis of complex aircraft engineering problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles. Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed Select appropriate materials and manufacturing methods for a range of aircraft and broader engineering components.
B2	Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts. Select and evaluate technical literature and other sources of information to address complex problems.
B3	Apply an integrated or systems approach to the solution of complex problems. Discuss the role of quality management systems and continuous improvement in the context of complex problems.
B4	Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.
B5	Demonstrate skills in the application and use of computer aided design software and use practical laboratory and workshop skills to investigate complex problems.
Communication, ICT and Numeracy Skills	
C1	Communicate design ideas through the use of 3D modelling software.
C2	Adopt a holistic and proportionate approach to the mitigation of security risks
C3	Demonstrate an understanding of the computer techniques available to enhance the communication of engineering ideas and concepts.
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Use appropriate quantitative science and engineering tools to the analysis of basic engineering problems.
D2	Demonstrate the ability to monitor, interpret and apply the results of analysis and modelling.
D3	Demonstrate the ability to apply basic quantitative methods relevant to mechanical engineering design problems.
D4	Demonstrate the ability to define a problem and identify constraints.
D5	Demonstrate the ability to use appropriate codes of practice and industry standards.
Autonomy, Accountability and Working With Others	
E1	Communicate effectively on complex engineering matters with technical and non-technical audiences.
E2	Develop an enhanced level of transferable skills that will be of value in working with others in more complex situations
E3	Function effectively as an individual, and as a member or leader of a team.
E4	Plan and record self-learning and development as the foundation for lifelong learning/CPD.

Core Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
8	ENGG08028	Fluids and Aerodynamics	20	✓			
9		Computer Aided Design 1 *	20	✓			
8	MATH08001	Mathematics For Design	20	✓			
8	ENGG08001	Materials & Manufacture	20		✓		
8	ENGG08017	Design Analysis 1	20		✓		
8	ENGG08029	Thermodynamics and Aircraft Propulsion	20		✓		

* Indicates that module descriptor is not published.

Footnotes

Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	

* Indicates that module descriptor is not published.

Footnotes

Criteria for Progression and Award

To progress from SCQF 8 to SCQF 9 in this programme, students are normally required to obtain 240 credits from the above programme.

Refer to Regulatory Framework 3.13 regarding progression with credit deficit.

Students obtaining 240 credits of which 100 are at SCQF 8 or above from the programme are eligible for the exit award of the Diploma of Higher Education in Engineering.

All pre-requisite modules must be passed before progression is allowed.

C. Learning Outcomes (Maximum of 5 per heading)

Outcomes should incorporate those applicable in the relevant QAA Benchmark statements

Knowledge and Understanding	
A1	Demonstrate and apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study.
A2	Demonstrate an understanding of manufacturing and operational practice relevant to engineering and design and the ability to apply them to analyse key engineering processes.
A3	Demonstrate an Knowledge and understanding of the characteristics of engineering materials and components and the ability to apply them to the analysis of key engineering components.
A4	Demonstrate a knowledge and understanding of the principles of IT and specialist software relevant to engineering and design, particularly CAE and the ability to use such software to the analysis and design of components and systems.
Practice - Applied Knowledge and Understanding	
B1	Demonstrate the analysis of complex aircraft engineering problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles. Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.
B2	Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed. Apply an integrated or systems approach to the solution of complex problems.

B3	Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts. Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.
B4	Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.
B5	Select and evaluate technical literature and other sources of information to address complex problems. Use practical laboratory and workshop skills to investigate complex problems. Discuss the role of quality management systems and continuous improvement in the context of complex problems. Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.
Communication, ICT and Numeracy Skills	
C1	Apply appropriate mathematical and analytical techniques in the solution of engineering and design problems;
C2	Demonstrate the ability to use relevant test, modelling, and measurement equipment in the laboratory;
C3	Adopt a holistic and proportionate approach to the mitigation of security risks.
C4	Ability to apply a systems approach to engineering problems through know-how of the application of relevant technologies;
C5	Communicate effectively on complex engineering matters with technical and non-technical audiences.
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Demonstrate problem solving skills appropriate to a mechanical, aircraft or design engineer;
D2	Assess the requirements of International Standards and their impact on system design
D3	Develop the ability to work independently or as part of a team;
D4	Develop the ability for effective use of information technology;
D5	Develop effective technical based communication skills;
Autonomy, Accountability and Working With Others	
E1	Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.
E2	Recognise the need for professional and ethical conduct in engineering and awareness of environmental issues
E3	Function effectively as an individual, and as a member or leader of a team. Communicate effectively on complex engineering matters with technical and non-technical audiences.
E4	Understanding of the requirement of Risk Assessments, and demonstrate the ability to compile a risk assessment
E5	Plan and record self-learning and development as the foundation for lifelong learning/CPD.

Core Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
9	ENGG09004	Project Management	20	✓			
9	ENGG09020	Design Analysis 2	20	✓			
9	ENGG09027	Aircraft Design and Performance	20	✓			
9	ENGG09011	Analysis & Simulation 1	20		✓		
9		Computer Aided Design 2 *	20		✓		

* Indicates that module descriptor is not published.

Footnotes

Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
9	ENGG09001	Design Prototyping & Testing	20		✓		2
9	ENGG09018	Independent Study	20		✓		1
9	ENGG09019	Applied Intelligent Systems	20		✓		1,2

* Indicates that module descriptor is not published.

Footnotes
1. Applied Intelligent Systems ENGG09019 & Independent Study ENGG09018 are options for Part-Time students only.
2. Applied Intelligent Systems ENGG09019 & Design Prototyping and Testing ENGG09001 are options for Full-Time students.

Criteria for Progression and Award

To progress from SCQF 9 to SCQF 10 in this programme, students are normally required to obtain 360 credits (240 already from HND) of which 100 credits are at SCQF 9 from the above programme.

Refer to Regulation 3.14 regarding progression with credit deficit.

To be eligible for the award of a BEng. Aircraft Engineering a candidate must normally obtain a minimum of a C grade in each module with Students obtaining 360 credits of which 100 are at SCQF9 or above and where all credits are from the core programme.

All pre-requisite modules must be passed before progression is allowed.
The award of distinction can be made to a student obtaining a pass degree as stated in the University Regulations.

Any student who has completed 360 credit points, 300 being in Engineering, and not as laid out above, may be entitled to exit with BSc Aircraft Engineering, at the discretion of the SBE.

All pre-requisite modules must be passed before progression is allowed.

D. Learning Outcomes (Maximum of 5 per heading)

Outcomes should incorporate those applicable in the relevant QAA Benchmark statements

Knowledge and Understanding	
A1	Demonstrate and apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study.
A2	Demonstrate a detailed knowledge and understanding of design principles and apply them to the development of an engineering design
A3	Demonstrate a detailed knowledge and understanding of advanced engineering principles including creep, plasticity, fracture mechanics, vibrations and condition monitoring.
A4	Demonstrate a detailed knowledge and understanding of aerodynamics as applied to aircraft design,
A5	Demonstrate a clear understanding of the scope, application and limitations of Finite Element Analysis and Computational Fluid Dynamics.
Practice - Applied Knowledge and Understanding	
B1	Demonstrate the analysis of complex aircraft engineering problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles. Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.
B2	Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed. Apply an integrated or systems approach to the solution of complex problems. Select and evaluate technical literature and other sources of information to address complex problems
B3	Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.
B4	Apply an integrated or systems approach to the solution of complex problems. Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts. Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty)

	associated with a particular project or activity. Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights
B5	Undertake research into a number of aircraft engineering related areas Undertake static and dynamic assessments of a range of aircraft engineering components or equipment Use practical laboratory and workshop skills to investigate complex problems Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations Discuss the role of quality management systems and continuous improvement in the context of complex problems.
Communication, ICT and Numeracy Skills	
C1	Use computer simulation to communicate design solutions
C2	Adopt a holistic and proportionate approach to the mitigation of security risks.
C3	Use computer software to present project results to a variety of audiences including peers, academics and industrialists
C4	Ability to apply a systems approach to engineering problems through know-how of the application of relevant technologies;
C5	Apply project management techniques and tools to an engineering problem;
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Demonstrate creative skills in preparing engineering design solutions
D2	Demonstrate the ability to investigate and solve engineering problems through the use of computer simulation
D3	Assess the requirements of international standards and how they impact on aircraft and component design
D4	Carry out individual and group projects in a professional manner
D5	Develop effective technical based communication skills;
Autonomy, Accountability and Working With Others	
E1	Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion
E2	Function effectively as an individual, and as a member or leader of a team.
E3	Plan and record self-learning and development as the foundation for lifelong learning/CPD
E4	Communicate effectively on complex engineering matters with technical and non-technical audiences
E5	Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct

Core Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
10	ENGG10001	Final Year Project	40	✓	✓		
10	ENGG10019	Analysis & Simulation 2	20	✓			
10	ENGG10027	Advanced Aerodynamics	20	✓			
10	ENGG10038	Model Aircraft Design Group Project	20	✓	✓		
10	ENGG10021	Composite Structures	20		✓		

* Indicates that module descriptor is not published.

Footnotes

Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	

* Indicates that module descriptor is not published.

Footnotes

Criteria for Award

To be eligible for the award of BEng Honours degree a candidate must hold 480 credits, including 120 at SCQF 10 from the above programme.
The Classification of Honours will be determined by University Regulatory Framework 3.20-3.24.Students must have obtained a pass in all modules listed as pre-requisites.

Regulations of Assessment

Candidates will be bound by the general assessment regulations of the University as specified in the University Regulatory Framework.

An overview of the assessment details is provided in the Student Handbook and the assessment criteria for each module is provided in the module descriptor which forms part of the module pack issued to students. For further details on assessment please refer to Chapter 3 of the Regulatory Framework.

To qualify for an award of the University, students must complete all the programme requirements and must meet the credit minima detailed in Chapter 1 of the Regulatory Framework.

Combined Studies

There may be instances where a student has been unsuccessful in meeting the award criteria for the named award and for other more generic named awards existing within the School. Provided that they have met the credit requirements in line with the SCQF credit minima (please see Regulation 1.21), they will be eligible for an exit award of CertHE / DipHE or BA / BSc in Combined Studies.

For students studying BA, BAcc, or BD awards the award will be BA Combined Studies.

For students studying BEng or BSc awards, the award will be BSc Combined Studies.

Changes

Changes made to the programme since it was last published:

v1.10
Programme Leader Updated to Dr Bassam Rakhshani
General Overview updated to reflect full return to campus delivery.
Admissions criteria updated to reflect current requirements.
Engagement text updated to reflect current institutional position.
EDI text updated to reflect current institutional position.
Level 7
Mathematics for Engineering 1 (T1 & T2) added in lieu of Engineering Mathematics 1 (T1) & 2 (T2).
Level 8
Computer Aided Design 1 (T1) added in lieu of Computer Aided Design (T1)
Level 9
Computer Aided Design 2 (T2) added in lieu of Aircraft Design Modelling and Analysis (T2)
Design Prototyping and Testing (T2) added as optional for Full-Time students, footnotes added to provide explanation.

v1.09
Details of Cohorts Applies to: Changes applies to Sept 22 onwards

General Overview
Text updated to reflect new AHEP4 specific learning outcome terminology, note the programme learning content has not changed merely the wording/terminology.

Text demonstrating how the programme aligns with UWS' Curriculum Framework principles added.

Work Based Learning/Placement Details
Module text withdrawn as module is now withdrawn.

Programme Structure/Learning Outcomes
Level 7-
Outcomes reworded to better reflect AHEP4 terminology. Aircraft Flight Studies ENGG07019 (10 Credits) and Aircraft Simulation and Programming ENGG07018 (10 Credits) replaced with Programming for Engineers ENGG07016 (20 Credits)- Alignment with Curriculum Framework Principle of 20 Credit norm.
Missing Module delivery terms added.
All reference to RBS and the modules ENGG07008 and MATH07003 removed as RBS no longer offer Level 7 Aircraft

Engineering.

Level 8-
Outcomes reworded to better reflect AHEP4 terminology.
ENGG08028 and ENGG08029 renamed to better reflect content.
Missing Module delivery terms added.
Level 9-
Outcomes reworded to better reflect AHEP4 terminology.
Level 10-
Outcomes reworded to better reflect AHEP4 terminology.
Missing Module delivery terms added.

v1.08
All cohorts entering from Sept 21 onwards
Level 7 Modules
Engineering Mathematics MATH07006 added to core (was optional) however there was effectively no other optional modules therefore inherently core.
Applied Engineering Science (ENGG07002) added as core to replace Applied Engineering Science 1 & 2 (ENGG07015/ENGG07013) - Curriculum Framework Development 2021.
Technical Communications in Engineering (ENGG07012) and Introduction to Intelligent Systems (ENGG07014) replaced by Technical Communications (20 Credits) (ENGG07004) - Curriculum Framework Development 2021.
Aircraft Aerodynamics Structures and Systems (ENGG07011) added to core, was optional, however there was no other optional modules therefore inherently core.
Footnotes updated accordingly.
Modules re-ordered
Level 8 Modules
Computer Aided Design (ENGG08002) added to core (was optional) however there was no other optional modules therefore inherently core.
Modules re-ordered

Level 9 Modules
Engineering Project Management (ENGG09046) and Manufacturing Systems Management (ENGG09047) deleted from core. These modules were replaced in 2020/21, retained in 2020/21 Programme Specification for resit students only but are now deleted.

Workplace Learning (Mech) (ENGG09030) deleted, this option has never been taken and is removed to reduce module numbers.
Modules re-ordered.

Level 10 Modules
Design Analysis 3 (ENGG10020) deleted from optional this is due to the term the module being offered switching and therefore no longer being available as an option in the correct term. As a result Model Aircraft Design Group Project (ENGG10038) added to core (was optional) as there are no longer options at Level 10.
Modules re-ordered.

v1.07
"We welcome applications from international students with equivalency of qualifications. Scholarships may be available on application" added to Other Required Qualifications/Experience section.

Level 9
ENGG09046 Engineering Project Management moved to optional from core with Footnote 1 to explain.
ENGG09047 Manufacturing Systems Management moved to optional from core with Footnote 1 to explain.
ENGG09019 Applied Intelligent Systems added to optional for Part-Time and RBS students, this will however effectively remain core for Full-Time students with Footnote 2 to explain.
Core Footnotes 1 and 2 deleted.
Optional Footnotes 1 and 2 added.
Level 10
ENGG10019 Analysis and Simulation 2 changed to T1 only was T1 and T2

v1.1 - Honours Year added 28 June 2011

V1.2 - Revised for Sept 2013-14 intake
1. Composite Structures (L10) moved from year 3 to year 4 as a option
2. Design Analysis 3 (L10) offered as an option
3. Design Analysis 2 (l9) is now core in year 3 replacing Composite Structures.

This will allow students to choose a composites design theme or a general analysis design theme
the underpinning for these modules will now be provided by introducing Design Analysis 2 (L9) in year 3 as a core subject. The HND is also being revised at Ayr College to underpin the DA2, as it has been noted that Engineering Mechanics underpinning for the Composite Structures and DA3 are weak coming from the HND.

4. Applied Intelligent Systems has been removed as an option from year 3 as the proposed Avionics themed route has not had any uptake and only the Structural theme has had student interest.

5. Aircraft Design and Modelling has changed trimester delivery with Aerodynamics and Performance in year 3

6. Aircraft Design & Modelling 2 has been replaced with Analysis & Simulation 2 now Core (which was an option) as to provide indepth CFD and FEA teaching.

In summary DA2 added to assist in student underpinning. Composite Structures is moved to L10 and is an option with DA3 which now becomes an option. Design and Modelling 2 is replaced with Analysis and Simulation 2 as content is identical and hence now a core.
7. Amended Workplace Learning module to ENGG09030, the 20 credit version.

v1.3
1. Level 9 (All Modules delivered at Paisley Campus Only in 16/17)
2. Aerodynamics and Aircraft Performance moved to T2.
3. Applied Intelligent Systems added as core in T1.
4. Avionics Systems Integration removed from Core and added to Optional
Level 10
5. Aicraft Systems moved to T2 and Optional
6. Analysis and Simulation 2 moved to T1
7. Composite Structures moved to Core from Optional
Level 9 and 10

8. Ayr College changed throughout to Ayrshire College.

v1.4
Ayrshire College removed from module descriptor as no longer collaborative partner on this programme.
Level 7
Aerodynamics, Structures and Systems added as optional with Engineering Industry moving from Core to optional.
Level 10
Model Aircraft Design Group Project added as optional.

v1.5
Admissions Criteria-
Entry qualifications updated for SQA Highers and A Levels to reflect current prospectus.

Study/Progression-
Graduate Attributes added in line with 2018 Graduate Attributes.
Placement information added.

Level 7 Modules-
ENGG07002 - Applied Engineering Science - Footnote 2
MATH07003 - Mathematics of Space and Change - Footnote 2
ENGG07004 - Technical Communications - Footnote 2
ENGG07008 - Intelligent Systems Concepts - Footnote 2
ENGG07012 - Technical Communications in Engineering - Added to Core & Footnote 1 (T1)
ENGG07013 - Applied Engineering Science 2 - Added to Core & Footnote 1 (T2)
ENGG07015 - Applied Engineering Science 1 - Added to Optional & Footnote 1 (T1)
ENGG07016 - Programming for Engineers - Added to Core & Footnote 1 (T2)
MATH07006 - Engineering Mathematics 1 - Added to Optional & Footnote 1 (T1)
MATH07007 - Engineering Mathematics 2 - Added to Core & Footnote 1 (T2)

Footnote 1 and 2 added.

Level 8 Modules-
ENGG08001 - Materials and Manufacture - Moved from T1 to T2
ENGG08002 - Computer Aided Design - Moved to Optional from Core (T1)
ENGG08021 - Introduction to Thermofluids - Delete
ENGG08025 - IT for Engineering - Delete
ENGG08026 - Engineering Management - Delete
ENGG08028 - Principles of Aerodynamics - Added to Core (T1)
ENGG08029 - Thermofluids for Aircraft Engineers - Added to Core (T2)

Level 9 Modules-
ENGG09019 - Applied Intelligent Systems - Moved T1 to T2
ENGG09027 - Aerodynamics and Aircraft Performance- Moved T2 to T1

Level 10 Modules-
ENGG10019 - Analysis and Simulation 2- Changed from T1 only to T1 & T2.
ENGG10028 - Aircraft Systems Engineering - Delete from Optional
ENGG10038 - Model Aircraft Design Group Project - Changed from T2 only to T1 and T2

v1.06
Date of Validation changed to March 2019 as a result of the March 2019 ILR event.
Details of Cohorts Applies to All cohorts entering from Sept 19 onwards added.
Maximum period of registration set to 5 Years for Full Time.

Programme Leader name added.
Programme engagement details added to section 29a.
Level 7
Aircraft Flight Studies ENGG07019 (10 Credits) added to T2 core Paisley Campus only.
Aircraft Simulation and Programming ENGG07018 (10 Credits) added to T2 core Paisley Campus only.
Programming for Engineers ENGG07016 (20 Credits) moved to T2 optional Paisley Campus only.
Regulation 7.3.4 changed to 3.13.

Level 8
Regulation 7.3.4 changed to 3.13.

Level 9
Engineering Project Management ENGG09046 (10 Credits) added to T1 Paisley campus only
Manufacturing Systems Management ENGG09047 (10 Credits) added to T1 Paisley campus only
Project Management ENGG09004 (20 Credits) changed to Rushmore Business School only.
Aerodynamics and Aircraft Performance name changed to Aircraft Design and Performance, Module Code ENGG09027 retained.

Level 10.
Regulation 7.5 changed to 3.20-3.24

Version Number: 1.10