University of the West of Scotland

Undergraduate Programme Specification

Session: 2023/24

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Status: Proposal

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

Award Title for Each Award:	**BEng (Hons) Engineering Management** **BEng Engineering Management** **Dip HE Engineering** **Cert HE Engineering Science**

Date of Validation:	April 2020
Details of Cohorts Applies to:	All students from Sept 2023

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:	N/A
Maximum Period of Registration:	Full-Time : 6 years, Part-Time : 8 years
Mode of Study:	Full Time Part Time
Campus:	Lanarkshire

School:	School of Computing, Engineering and Physical Sciences
Programme Board	Engineering
Programme Leader:	Dr Farhad Anvari

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:

or SQA National Qualifications/Edexcel Foundation

Year 3 Entry- SQA HND / BTEC Level 5 HND: Aircraft Engineering or Electrical Engineering or Architectural Technology or Engineering Systems or Engineering: Mechanical or Mechanical Engineering or other relevant discipline (for SQA HND, with Grade B in the Graded Units)

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

N/A

General Overview

This programme is a development of a previous award of a similar name which has been offered for the past 20 years Most years have yielded an average of 30 graduates.

This programme has been developed in response to three major influences; an identified skills shortage of competent engineers in industry, constant demand for courses in engineering management at all levels in HE and a recognised need for the University to produce 'generalists' in order to improve student recruitment, retention, achievement and employment.

The Engineering sector has shrunk and has restructured, leaving behind a 'leaner and fitter' industry. There are fewer large firms due to downsizing and outsourcing and as a result many small firms take on more responsibility which in turn has changed the required skills mix. The content of this programme reflects this and more than 40 companies continue to sponsor students on a part time mode of study.

Three main themes influence this programme and are developed throughout the four years of the programme. The themes combine to produce effective graduates that can work initially as Incorporated Engineers but may eventually progress to become Chartered Engineers. Underpinning all three themes is the development of key interpersonal and transferable skills. In addition the themes are informed by the use of industrial visits, specialist visitors, project work and case studies.

The three themes that influence the programme are as follows:

Engineering and Technology

The Engineering and Technology theme develops an understanding of fundamental engineering theory, basic design and the use of graphical and analytical methods in the early years. The theme is developed throughout later years with the study of applications of engineering with particular reference and relevance to current practices within Industry.

Industry Practice and Engineering Management

The theme of Industry Practice and Engineering Management combines academic study with industrial practice and experience of the application of Planning and of Engineering Management. This is supported by the use of case studies, role play exercises, individual and group work and the application of current continuous improvement tools and strategies. The theme is further developed by evaluating the effectiveness of the various techniques studied.

Project and Business Management

This theme encompasses the study of project and business management with the aim of strengthening and broadening the students' management skills that are required at all levels within the engineering profession. The theme develops students' abilities in critically appraising engineering systems and service functions with the aim of determining the contribution made by each.

Student may progress to an MSc in Engineering Management or others on offer at UWS. 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. Much of this is left to the professionalism of the staff delivering the material with traditional lectures and tutorials still forming the basis for much of the teaching within engineering. Extensive use is also made of laboratories, seminars, group work, independent learning and demonstrations. More use is now being made of problem-based learning materials in the teaching environment. One of the main objectives in this area is to keep teaching materials as interesting and as relevant 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 VLE. Engineering has a policy of using small tutorial groups in key subject areas and either sub-divides cohorts into small groups or increases staff numbers in classes or laboratories. All modules are taught by subject experts and for final year students staff make use of case study materials and topics raised through their industrial activities whether project, research or consultancy based. Many case studies and examples of applications are taken from live industrial situations. Design and Engineering 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. Design and Engineering has its own extensive Networks (currently running five servers) to support all of the area's activity. Students have access to 40+ higher specification PC workstations in laboratories dedicated specifically for the Design and Engineering students. Students and staff have personal accounts for the Design and Engineering networks with students able to gain 12 hour access to one of the area's Computing Laboratories, most days per week. Staff use the networks to deliver materials electronically. Indeed, many modules are now supported electronically, providing notes, copies of lectures, models, sample simulations etc. The standard system for providing a VLE (Virtual Learning Environment) within the University is Moodle, which is used all most staff. This system is used mainly for dissemination of materials and information regarding module administration. Students can also contact staff via e-mail and vice-versa. Students are supplied with staff contact details (including e-mail addresses) in the Programme handbooks. There are examples within engineering teaching where staff make use of this VLE to perform additional Teaching and Learning activities such as on-line tests and assessments. A variety of assessment methods are used throughout programmes. These range from class tests, laboratory reports, design assignments, individual and group presentations and formal examinations. In the 1st trimester of the 1st year, assessment is by class test and coursework. This aims to build confidence in the student's ability to pass modules. Some examinations are introduced into the 2nd trimester of the 1st year and thereafter most of the modules have a substantial examination element. 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. Honours projects and group projects are double marked. Mixtures of formative and summative methods are used in the assessment of student performance within engineering. It is recognised that while most of the assessments are summative in nature, demands from students have indicated a desire for more assessment, which delivers regular feedback. This has been attempted where possible but puts extreme demands on the available time which staff within Design and Engineering have for marking. There are a number of modules with PDP elements that are integrated with the module content (eg Engineering Management and IT). However there are additional hours and a number of PDP activities that will be scheduled and presented outwith the selected modules in accordance with school PDP guidelines. These will be presented, where possible, on the normal days of student attendance.

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 many modules of this programme 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 demonstrated through the recording of accessible lecture content and onby on-campus lectures, tutorials, laboratory orand 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.
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 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

During the course of this programme students will develop their UWS Graduate Attributes. Academic Universal and Work-ready attributes: Students will gain knowledge and understanding of this important discipline as well as having the opportunity to develop a broad range of ICT, technical and transferable skills.

Graduate Attributes, Employability & Personal Development Planning

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 Engineering Management programme provides opportunities throughout the levels to enable these skills to be developed and focussed appropriately.

Engineering Management knowledge is assembled throughout the programme and wherever possible digital literacy skills and ability to provide effective solutions is enhanced utilising industry standard appropriate methods and technologies such as Lean, Six Sigma, TPM, TQM, and CAD, CAM, Simulation and Project Management softwares.

Particularly, but not exclusively, in later years of the programme, critical analytical and inquiry skills are developed and used to solve industry related problems.

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 opearations 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 the 4th year during project studies where School/University ethical approval is sought if required.

Employability

The local engineering management market contains a number of international companies 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 the programme is also organised to allow part time entry allowing those in employment to undertake 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

This programme offers an optional 20 credit, level 9, Work-Based-Learning (WBL) module which must be agreed and documented according to the module descriptor before the module can be undertaken. Also an optioanal 20 credit, level 10 WBL module.

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

Further information on the institutional approach to Equality, Diversity and Inclusion can be accessed at the following link: https://www.uws.ac.uk/about-uws/uws-commitments/equality-diversity-inclusion/

Aligned with the University's commitment to equality and diversity, this programme 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	.
Practice - Applied Knowledge and Understanding	
B1	
Communication, ICT and Numeracy Skills	
C1	
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	
Autonomy, Accountability and Working With Others	
E1	

Core Modules

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

* Indicates that module descriptor is not published.

Footnotes

Optional Modules

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

* Indicates that module descriptor is not published.

Footnotes

Criteria for Progression and Award

B. Learning Outcomes (Maximum of 5 per heading)

Outcomes should incorporate those applicable in the relevant QAA Benchmark statements

Knowledge and Understanding	
A1	Demonstrate a deeper knowledge of the management concepts as applied to an engineering or engineering service type industry
A2	Demonstrate an extended knowledge of the different types and characteristics of engineering materials.

A3	Demonstrate a knowledge of primary and secondary manufacturing processes
Practice - Applied Knowledge and Understanding	
B1	
Communication, ICT and Numeracy Skills	
C1	
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	
Autonomy, Accountability and Working With Others	
E1	

Core Modules

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

* Indicates that module descriptor is not published.

Footnotes

Optional Modules

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

* Indicates that module descriptor is not published.

Footnotes

Criteria for Progression and Award

C. Learning Outcomes (Maximum of 5 per heading)

Outcomes should incorporate those applicable in the relevant QAA Benchmark statements

Knowledge and Understanding	
A1	Demonstrate knowledge and understanding of 3D Modelling and Rapid Prototyping techniques.
A2	Demonstrate an integrated knowledge and understanding of project organisation, management and execution.
A3	Demonstrate an integrated knowledge and understanding of the team based approach to project management.
A4	Demonstrate a knowledge of advanced troubleshooting techniques and their application
Practice - Applied Knowledge and Understanding	
B1	Undertake testing, data-collection and analysis for engineering products and systems
B2	Compare the results from a laboratory test with the theoretical values generated from computer analysis software.
B3	Undertake a risk assessment for a selected engineering procedure or test
B4	Apply project tools to execute a prescribed project with set boundaries
Communication, ICT and Numeracy Skills	
C1	Demonstrate the ability to create 3D models of engineering products as a communication aid.

C2	Demonstrate the application of further analysis as an integrated CAE application
C3	Demonstrate to ability to present complex engineering or system data to an audience
C4	Use project management software as a planning tool to improve the probability of completing a project on time and within budget.
C5	Use computer software to develop a rapid prototype to assist in communicating ideas and concepts to potential customers

Generic Cognitive Skills - Problem Solving, Analysis, Evaluation

D1	Undertake a critical analysis of a current manufacturing system and propose alterations to improve efficiency
D2	Analyse business data as the basis for financial decision making
D3	Undertake a comparison between several engineering approaches to manufacturing methods

Autonomy, Accountability and Working With Others

E1	Ability to work independently or as part of a team
E2	Prepare, under supervision a risk assessment in line with current industry practice
E3	Carry out testing, or another engineering activity in line with agreed procedures

Core Modules

SCQF Level	Module Code	Module Name	Credit	Term 1	Term 2	Term 3	Footnotes
9	ENGG09006	Engineering Management 1	20	✓			
9	ENGG09004	Project Management	20	✓			
9	ENGG09001	Design Prototyping & Testing	20		✓		
9	ENGG09008	H&S and Risk Assessment	20		✓		

* Indicates that module descriptor is not published.

Footnotes

Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term 1	Term 2	Term 3	Footnotes
9	ENGG09007	Project Tool Box	20	✓			Recommended option.
9	ENGG09018	Independent Study	20		✓		Recommended option.
		Any other appropriate option at level 9 or 8					Note 1

* Indicates that module descriptor is not published.

Footnotes
Note 1: Students who do not wish to take one of the recommended option modules shown above can select any other Level 9 or Level 8 20 credit module that is deemed suitable by the programme leader and which is appropriately timetabled.

Criteria for Progression and Award

To progress from SCQF 9 to SCQF 10 in this programme, students are normally required to obtain 360 credits of which 120 credits are at SCQF 9 or higher from the above programme.

Students obtaining 360 credits of which 120 credits are at SCQF 9 from the above programme are eligible for the exit award of BEng Engineering Management.

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 Engineering, at the discretion of the PAB.

D. Learning Outcomes (Maximum of 5 per heading)

Outcomes should incorporate those applicable in the relevant QAA Benchmark statements

Knowledge and Understanding	
A1	Demonstrate a detailed and innovative understanding of the integration of a range of engineering techniques through project activity
A2	Demonstrate a detailed knowledge and understanding of engineering principles and apply them to the development of an engineering system.
A3	Demonstrate a clear understanding of the scope, application and limitations of computer simulation when applied to engineering processes
A4	Demonstrate a deep understanding of the essential relationships between service and engineering functions.
A5	Demonstrate a further in-depth knowledge and understanding of the key elements of a managed project activity involving multiple projects.
Practice - Applied Knowledge and Understanding	
B1	Integrate a number of engineering planning activities through a major individual project
B2	Undertake a design, evaluate, manufacture and test team-based project
B3	Apply computer based simulation to optimise a process
B4	Apply discrete event simulation to the design and optimisation of a system.
B5	Apply continuous improvement tools to record and improve engineering systems
Communication, ICT and Numeracy Skills	
C1	Use computer simulation to communicate system solutions and the optimisation of a range of processes
C2	Analyse and evaluate advanced process data as a means of optimising a process or system
C3	Use computer software to present project results to a variety of audiences including peers, academics and industrialists
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Demonstrate creative skills in preparing system improvement solutions
D2	Demonstrate the ability to investigate and solve system problems through the use of advanced techniques
D3	Assess the requirements of international standards and how they impact system design
D4	Carry out individual and group projects in a professional manner
Autonomy, Accountability and Working With Others	
E1	Practice project planning, time and resource management techniques
E2	Working with peers demonstrate a high level of ability to function effectively as a team member, demonstrating leadership when required
E3	Undertake and complete an individual product or process design project
E4	Investigate and apply relevant international standards to a particular design study.
E5	Analyse the risk involved in the design and operation of a product or process

Core Modules

SCQF Level	Module Code	Module Name	Credit	Term 1	2	3	Footnotes
10	ENGG10008	Engineering Management 2	20	✓			
10	ENGG10007	Advanced Project Management	20		✓		
10	ENGG10001	Final Year Project	40	✓	✓		

* Indicates that module descriptor is not published.

Footnotes

Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term 1	2	3	Footnotes
10	WRKB10002	WBL 4 - Industrial Project (20 Point)	20	✓			Recommended option.
10	ENGG10010	Manufacturing Systems Engineering	20		✓		Recommended option.
10	WRKB10001	WBL 4 - Industrial Project (40 Point)	40	✓	✓	✓	Recommended option for Part-time students. (Note 1)
		Any other appropriate option at level 10 or 9					Note 2

* Indicates that module descriptor is not published.

Footnotes
Note 1: WRKB10001 WBL4 - Industrial Project is an option only available to students who are in employment within a relevant company who can provide a suitable industrial project. Students taking WRKB10001 must also complete the ENGG10001 Final Year Project module.

Note 2: Students who do not wish to take one of the recommended option modules shown above can select any other level 10 or level 9 20 credit module that is deemed suitable by the programme leader and which is appropriately timetabled.

Criteria for Award

To be eligible for the award of BEng Honours degree a candidate must hold 480 credits, including 100 at SCQF 10 from the above programme.

The Classification of BEng (Hons) Engineering Management will be determined by University Regulation 3.20-3.24.

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
Details of Cohorts Applies to: Changes applies to Sept 23 onwards
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 9
ENGG09030- Workplace Learning (Mech) deleted. Module has been withdrawn
Level 10
Digital Transformation Trends in projects ENGG11052 deleted as an option as it is no longer offered by the School.
24/10/2022
Digital transformation trends in projectsENGG11052 added to options for L10

Version Number: 1.10