University of the West of Scotland

Undergraduate Programme Specification

Session: 2024/25

1	**Named Award Title:**	BEng (Hons) Chemical Engineering (Sandwich Available) Single	
2	**Award Title for Each Award:**	MEng (Hons) Chemical Engineering (Sandwich Avail.) BEng (Hons) Chemical Engineering (Sandwich Available) BSc Chemical Engineering (Sandwich Available) Dip HE Engineering Cert HE Engineering Science	
3	**Date of Validation / Approval:**	March 2019	
4	**Details of Cohorts Applies to:**	All those entering SCQF Levels 7, 8, 9, 10 and 11 from Sept 2022	
5	**Awarding Institution/Body:**	University of the West of Scotland	
6	**Teaching Institution:**	University of the West of Scotland	
7	**Language of Instruction & Examination:**		English
8	**Award Accredited By:**	CEng accreditation by the IChemE will be pursued in due course.	
9a	**Maximum Period of Registration:**	7 years (including **optional** Sandwich placement)	
9b	**Duration of Study:**	Full Time Part Time	
10	**Mode of Study:**	Full Time	
11	**Campus:**	Paisley	
12	**School:**	School of Computing, Engineering and Physical Sciences	
13	**Programme Board:**	Engineering	
14	**Programme Leader:**	Mojtaba Mirzaeian	

15. 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:

Year 1: H: BCCC (90 UCAS Tariff points) including Maths and Chemistry plus SQA National 5 (Grade C or above) or Intermediate 2 (Grade B, or above), or Standard Grade (Credit) English.

Year 2: Entry may be possible with: SQA Advanced Highers: CCC (120 UCAS Tariff points) including Maths and Chemistry.

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or GCE

Year 1: BCC (112 UCAS Tariff points) including Maths and Chemistry
Year 2: CCC (120 UCAS Tariff points) including Maths and Chemistry

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or SQA National Qualifications/Edexcel Foundation

Year 2 HNC Chemical Engineering or related subject (including Process Technologies).
Year 3 HND Chemical Engineering or related subject (including Process Technologies).

Other Required Qualifications/Experience

Applicants may also be considered with other academic, vocational or professional qualifications deemed to be equivalent.

Further desirable skills pre-application (i.e. to satisfy additional PSRB requirements or other)

16	**General Overview** The MEng in Chemical Engineering is a unique UK integrated masters taught programme that draws upon the industrial experience and research strengths of the University of The West of Scotland in Chemical Engineering and other engineering disciplines. It offers an advanced qualification for engineering students wishing to progress their career and develop an in-depth and practical understanding of Chemical Engineering in the chemical process industries such as food, petrochemicals, pharmaceuticals, energy, electronics, cosmetics, fine chemicals, etc. The content of the programme is both timely and is desired by industry both locally and globally. The MEng is intended to be completed in a minimum of 5 years period synchronised with the main undergraduate intake in September. Student learning is through an arrangement of lectures, tutorials, case studies, laboratory work, research and independent learning. The units are continuously assessed (reports, projects, oral presentations, seminars), examined by a written exam, or a combination of these assessment methods. The programme is designed to provide a sound fundamental knowledge of engineering and related enabling sciences, and the practical skills to operate successfully in the chemical industry in areas such as the pharmaceutical industry, energy industry, environmental sector, food industry, electronic industry, nuclear industry, as well as in academic research and teaching. Chemical engineering degrees at the university are recognised by employers as having a strong applied focus which is a good preparation for work in many industries. Professional skills are developed throughout the programme through practical and project work, problem solving activities with the aid of computer technology, group working, together with the analytical, numerical, management and communication skills which are expected of the modern engineer. The programme combines a strong academic content with the opportunity for direct, hands-on experience in the laboratory and during industrial placement with modern processing equipment and process design and analysis software. The programme includes an optional industrial placement which allows the development of additional skills and can enhance employability. Chemical Engineering covers a wide variety of theoretical, conceptual and practical areas, and requires its practitioners to display and exercise a range of knowledge and skills. Delivery of the programme therefore involves a diversity of teaching and assessment methods appropriate to the learning outcomes of the modules and of the overall programme, as indicated below: Lectures are used to present, discuss and evaluate subject matter and content. Tutorial work is closely integrated with the lecture material, and generally requires students to solve problems or otherwise to develop understanding of the materials presented. Investigations and case studies require students to gather, organise and evaluate numerical or non-numerical information, either individually or on a group basis (the latter specifically designed to develop team work skills). Most modules involve an element of practical work, to develop laboratory skills, to familiarise students with modern process equipment and experimental techniques and to enhance practical, analytical, investigative, evaluative and presentational skills. Assignments, investigations, laboratory results and other coursework require presentation in a variety of forms, developing skills in oral and written presentation and in the application of various forms of IT. The syllabus is designed to encourage enquiry and several modules use open ended problems to develop students' skills. The level and intensity of the programme is developed throughout the programme in line with SCQF criteria for each level, while the content is closely aligned with QAA subject benchmark statements at all stages. Student autonomy and individual responsibility for learning is encouraged at all levels and PDP is developed throughout the programme.

	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]. **Flexible and Hybrid** Programme Delivery Delivery of the programme is by on-campus lectures, tutorial, laboratory or 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 L11- MEng Research Project, although students also participate in the L10 capstone for BEng(Hons) Chemical Engineering - Chemical Engineering Design Study. 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 ensure the curriculum is and continues 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
17	**Graduate Attributes, Employability & Personal Development Planning**
	UWS' Graduate Attributes focus on academic, personal and professional skills and throughout the programmes that these skills develop competent and innovative graduates who are universally prepared, work-ready and successful (https://www.uws.ac.uk/current-students/your-graduate-attributes/). Upon completing this programme the students will be equipped with tools that will help them in their journey to be work-ready, successful and universal. The programme develops critical thinking and analytical skills that enhance the students' ability to deal with complicated issues and make them problem solvers. It encourages them to become motivated, innovative, autonomous, inquisitive, creative and imaginative. The programme and the teaching approaches encourage collaborative working, effective communications, resilience and perseverance, and development of research and inquiry skills. The aim is to produce graduates who are knowledgeable with excellent digital skills fit for the 21st century and aware of the global context in which they operate and the challenges that face humanity in the 21st century in the areas of water, food, energy, environment and well-being, who strive to lead, influence and dare to make transformational changes while being ethically-minded, socially responsible, critically aware of the environmental and social impacts of their decisions and actions, and culturally sensitive. The chemical and process engineering knowledge is developed throughout the programme using a variety of means including direct contact, projects, research, simulation and other productivity software utilisation wherever possible. This allows the development of graduates who are continuous learners, adaptive, innovative and leaders with the requirements of the 21st century chemical and process industries. 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 engineering, safety, environmental protection, economics, and the over-arching regulatory frameworks for the chemical industry. Projects and research activities are used to prepare designs and analyse problems 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 process design activities throughout the programme ensuring that costs associated with any process including capital costs, operating costs and/or decommissioning costs are evaluated and compared to other possible alternatives. Ethical awareness and social responsibility are developed throughout as integral part of the programme. A total approach that considers impact on human, biota and the environment is followed. 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. The existing arrangements for PDP (Personal Development Planning) are being phased out as the UWS replace them with a university-wide approach. The timetabled PDP sessions will be associated with the following core modules for the Chemical Engineering programme: Level 8: Term 1: Chemical Engineering Fundamentals Term 2: Process Modelling and Simulation Level 9: Term 1: Chemical Process Principles Term 2: Process Design, Control and Safety Level 10: Term 1 & 2: Chem Eng Design Study Term 2: Process Dynamics and Control Level 11: Term 1 & 2: MEng Chem Eng Research Project
18	**Work Based Learning/Placement Details** The programme includes a thick based approach to Workplace learning which involves a year placement between third and fourth year. If a student completes at least 36 weeks of work placed learning the student is eligible for the 'sandwich award' title The programme offers a 40 credit, Workplace Learning module which must be agreed and documented according to the module descriptor before the module can be undertaken.
19	**Attendance and Engagement**
	In line with the Student Attendance and 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 VLE, and complete assessments and submit these on time. For the purposes of this programme, academic engagement equates to the following: 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.
20	**Equality and Diversity**
	The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: UWS Equality, Diversity and Human Rights Code.

	Please detail any specific arrangements for this programme. This should be considered and not just refer the reader to the 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 be 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)

21	**Learning Outcomes (Maximum of 5 per heading)**
	Outcomes should incorporate those applicable in the relevant QAA Benchmark statements.
	SCQF LEVEL 7 **Learning Outcomes (Maximum of 5 per heading)**
Knowledge and Understanding	
A1	Demonstrate a broad knowledge of chemical structures, reactions and equilibria, relate knowledge to chemical theories, concepts and principles, and show an awareness of the evidence base for chemical science
A2	Show an awareness of the fundamentals of engineering sciences.
A3	Appreciate basic issues in health and safety at work.
A4	Show an awareness of the different engineering materials and their properties.
A5	Develop the ability of engineering and scientific problem solving using applied mathematics.
Practice - Applied Knowledge and Understanding	
B1	Apply basic knowledge and skills in solving routine problems in engineering and chemistry
B2	Demonstrate the practice of basic laboratory skills
B3	Be able to carry out risk assessments before carrying out basic laboratory and workshop activities
B4	Introduce the use and application of technical literature and other information sources.
B5	Develop practical engineering skills acquired through individual and group project work and the use of CAD packages.
Communication, ICT and Numeracy Skills	
C1	Tackle a range of numerical and non-numerical problems in theoretical and practical situations
C2	Present information in a variety of forms relevant to the context
C3	Obtain information and data from standard sources.
C4	Present and understand graphical depiction of information and engineering drawings.

Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Present and evaluate information and ideas in the handling of chemical and engineering issues
D2	Use a range of approaches to the solution of routine problems.
Autonomy, Accountability and Working With Others	
E1	Exercise some initiative in and take responsibility for defined activities
E2	Take supervision especially in unfamiliar laboratory situations
E3	Work with others in defined group exercises
E4	Develop skills in planning, self-learning and improving performance, as the foundation for lifelong learning/CPD.

Learning Outcomes - Level 7 Core Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
7	ENGG07002	Applied Engineering Science	20	✓	✓		
7	CHEM07011	Chemistry & Reactions	20		✓		
7	MATH07011	Applied Mathematics 1	20	✓			
7	ENGG07001	Engineering Mechanics	20		✓		
7	CHEM07003	Structure of Chemistry	20	✓			
7	ENGG07004	Technical Communications	20	✓			

Footnotes for Core Modules:

N/A

Learning Outcomes - Level 7 Optional Modules

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

* Indicates that module descriptor is not published.

Footnotes for option modules

N/A

* Indicates that module descriptor is not published.

22 a	**Level 7** **Criteria for Progression and Award**
	Rules for progression are as given in the university's regulatory framework. 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. In line with PSRB requirements students are normally required to obtain 120 credits from the above programme and achieve an average of all modules of =60% in order to progress from SCQF 7 to SCQF 8 in this programme. All pre-requisite modules must be passed before progression is allowed. Refer to Regulation 3.13 regarding progression with credit deficit, note, the decision to permit a proceed with carry is not automatic but is subject to detailed discussion at the SBE. Distinction will be awarded in line with University Regulations and no imported credit can be used. (Regulations 3.35 & 3.26) Links: UWS Regulatory Framework; and Student Experience Policy Statement.

	Level 8 **Learning Outcomes (Maximum of 5 per heading)**
Knowledge and Understanding	
A1	Demonstrate a broad knowledge of main areas of chemical engineering and develop understanding of the components of a chemical process facility and familiarity with the different equipment used in the process industry.
A2	Display an understanding of some major core theories and principles of engineering, mathematics and chemistry.
A3	Show some knowledge of major current issues pertaining to the process industry and appreciate the importance of safety, environmental protection and sustainability in chemical engineering context.
A4	Develop an appreciation of the basic issues related to chemical and process engineering.
A5	Development of knowledge and understanding of the mathematical principles underpinning chemical engineering and develop the ability to apply this knowledge to practical chemical engineering problems using process modelling and simulation.
Practice - Applied Knowledge and Understanding	

B1	Use a range of routine skills, techniques and practices in engineering, mathematics and chemistry, including some advanced aspects
B2	Use a range of routine skills, techniques and practices in chemical engineering
B3	Carry out routine investigations into practical and theoretical issues.
B4	Ability to use knowledge of chemical engineering to identify major hazards associated with a chemical process.
Communication, ICT and Numeracy Skills	
C1	Use a range of standard applications and instrumentation to obtain and process data.
C2	Apply and evaluate numerical and graphical procedures to laboratory and literature data.
C3	Present information in numerical, graphical and verbal forms to a variety of audiences.
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Undertake critical analysis, evaluation and synthesis of information related to the main ideas and concepts within the discipline.
D2	Use a variety of approaches to develop solutions to defined problems.
D3	Display a critical evaluation of solutions and explanations of experimental data.
Autonomy, Accountability and Working With Others	
E1	Exercise autonomy and initiative in defined professional activities.
E2	Take responsibility for work planning and time management within specified contexts.
E3	Co-operate in group working exercises.
E4	Work under guidance on current professional practice and issues.

Learning Outcomes - Level 8 Core Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
8	ENGG08022	Chemical Engineering Fundamentals	20	✓			
8	ENGG08017	Design Analysis 1	20		✓		
8	ENGG08021	Introduction to Thermo-Fluids	20		✓		
8	MATH08001	Mathematics For Design	20	✓			

8	CHEM08001	Physical Chemistry 2	20	✓			
8	ENGG08024	Process Modelling and Simulation	20		✓		

* Indicates that module descriptor is not published.

Footnotes for Core Modules:

N/A

Learning Outcomes - Level 8 Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
9	ENGG00001	Sandwich Placement: Engineering	40	✓	✓	✓	

* Indicates that module descriptor is not published.

Footnotes for option modules

N/A

22b	**Level 8** **Criteria for Progression and Award**
	Rules for progression are as given in the university's regulatory framework. A Diploma in Higher Education Engineering is available in accordance with University regulations. (At least 240 credits are required of which a minimum of 90 are at least SCQF level 8). Progression to SCQF 9 is subject to academic advice and module prerequisites. To progress from SCQF 8 to SCQF 9 in this programme, students are normally required to obtain 240 credits from the above programme and achieve an overall average of all modules of =60% at Level 8. UWS regulations apply with regard to individual modules passes. All pre-requisite modules must be passed before progression is allowed. Refer to Regulation 3.13 regarding progression with credit deficit, note, the decision to permit a proceed with carry is not automatic but is subject to detailed discussion at the SBE. Distinction will be awarded in line with University Regulations and no imported credit can be used. (Regulations 3.35 & 3.26) Links: UWS Regulatory Framework; and Student Experience Policy Statement.

	SCQF LEVEL 9 Learning Outcomes (Maximum of 5 per heading)
Knowledge and Understanding	
A1	Demonstrate a broad and integrated knowledge and understanding of major aspects of chemical engineering.
A2	Display a critical understanding of principal theories, concepts and terminologies of chemical engineering science.
A3	Develop an integrated approach to chemical processing including safety, environmental issues, sustainability, economics and management.
A4	Awareness of the importance of safe working practices and of risk assessment.
Practice - Applied Knowledge and Understanding	
B1	Use a selection of skills, techniques and practices in handling chemical engineering concepts and experimental information.
B2	Display skills in selected equipment, techniques, practices and information at a specialised level in chemical engineering.
B3	Demonstrate ability to critically analyse a chemical process to identify the risks involved.
B4	Practise routine and novel investigations and enquiries in chemical engineering.
Communication, ICT and Numeracy Skills	
C1	Make formal and informal presentations on topics in chemical engineering by a variety of methods to a range of audiences.
C2	Use a range of IT applications to obtain and manage information and to process and present experimental data.
C3	Display the use of numerical and graphical procedures to interpret numerical information.
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Undertake critical analysis, evaluation and synthesis of ideas, concepts, information and issues in the discipline.
D2	Identify and analyse routine professional problems and issues.
D3	Make use of a range of sources in making judgments and decisions.
Autonomy, Accountability and Working With Others	
E1	Exercise some autonomy and initiative in dealing with activities at a professional level
E2	Take some responsibility for the work of others and for the use of resources
E3	Practise working in group exercises taking account of others' roles and responsibilities.

E4	Work under guidance on aspects of professional skills and ethical codes.

Learning Outcomes - Level 9 Core Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
9	ENGG09053	Biochemical and Environmental Engineering	20	✓			
9	ENGG09037	Chemical Process Principles	20	✓			
9	ENGG09049	Computer Aided Process Analysis and Design	20	✓	✓		
9	ENGG09036	Process Design, Control and Safety	20		✓		
9	ENGG09040	Thermodynamics & Heat Transfer	20	✓			
9	ENGG09038	Unit Operations 1	20		✓		

* Indicates that module descriptor is not published.
Footnotes for Core Modules:

Students need to pass all core modules in order to progress to the final year of the BEng Hons programme.

Learning Outcomes - Level 9 Optional Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
9	ENGG00001	Sandwich Placement: Engineering	40	✓	✓	✓	

Footnotes for option modules

All students undertaking the optional Industrial Placement year need to enrol on the module ENGG00001 (Sandwich Placement Engineering).

22c	**Level 9** **Criteria for Progression and Award**
	Rules for progression are as given in the university's regulatory framework. A BSc degree in Chemical Engineering is awarded subject to University regulations. (At least 360 credits are required with 200 in the subject area, of which a minimum of 90 are at SCQF level 9). If a student completes at least 36 weeks of work placed learning the student is eligible for the 'sandwich award' title. Subject to the criteria specified in the Regulatory Framework, this award may be made with Distinction as per university regulations. A mean mark of 65% or above, or, a mean mark of at least 62% and a majority of the modules in the highest level of study at grade B1 or better, with no module graded at C. Students completing the above described programme and obtaining 360 credits are eligible for the exit award of the BEng in Chemical Engineering. Progression to SCQF 10 is subject to academic advice and module prerequisites. To progress from SCQF 9 to SCQF 10 in this programme, students are normally required to obtain 360 credits from the above programme and achieve an average of all modules of =60% in at least 2 of the first 3 years of study inclusive of SCQF Level 9. 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 SBE. Refer to Regulation 3.14 regarding progression with credit deficit. Distinction will be awarded in line with University Regulations and no imported credit can be used. (Regulations 3.35 & 3.26) Links: UWS Regulatory Framework; and Student Experience Policy Statement.

	SCQF LEVEL 10 Learning Outcomes (Maximum of 5 per heading)
Knowledge and Understanding	
A1	Knowledge and critical understanding of a broad range of engineering principles and theories of the main areas of chemical engineering
A2	Familiarity with the principles and applications of a range of modern design techniques and the ability to identify, define, and plan the steps necessary to design a chemical process and to carry out detailed design of process equipment
A3	Knowledge of modern specialist topics in selected areas of chemical engineering, and awareness of major issues at the frontiers of chemical process development
A4	Understanding of factors influencing the feasibility, design, commissioning and operation of chemical, process and biochemical plants including environmental and economic issues
A5	Awareness of the structure of industrial organisations and economic environment in which they operate. A6. Develop clear understanding of the importance of energy conservation and emissions reduction through knowledge of process integration and waste minimisation principles. A7. Show evidence of the application of energy preservation principles in relation to the design process.
Practice - Applied Knowledge and Understanding	
B1	Practical skills in unit operations or reactor laboratory practice.
B2	The use of engineering software for the synthesis, design, analysis and evaluation of chemical processes.
B3	Investigative skills and planning of strategies in problem solving.
B4	Ability to use printed and other published materials as a learning resource.
B5	Execution of a defined programme of research / investigation / design.
Communication, ICT and Numeracy Skills	
C1	Communicate effectively within a team or group, to a non-expert audience and to individuals using a variety of means.
C2	Information management skills, especially IT skills including on-line computer searches.
C3	The ability to use, interpret results, and communicate outcomes of variety of discipline specific IT products such as process simulators, process safety analysis, cost estimation, process integration, and thermal systems analysis software.
C4	The ability to apply information technology to the design process.

C5	The ability to use IT to facilitate collaboration and information sharing within the organisation as well as communication with clients and other stakeholders.
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Development of rigour in investigation, evaluation and analysis.
D2	Synthesise information from a number of sources to gain a coherent understanding of theory and practice.
D3	The ability to use analytical and modelling technique to describe and evaluate the performance of systems and processes.
Autonomy, Accountability and Working With Others	
E1	Operate effectively in a group / team situation.
E2	Take responsibility for personal and professional learning and development.
E3	Management of time and prioritising of workloads.

Learning Outcomes - Level 10 Core Modules

SCQF Level	Module Code	Module Name	Credit	Term			Footnotes
				1	2	3	
10	ENGG10031	Chemical Engineering Design Study	40	✓	✓		
10	ENGG10033	Chemical Reactor Engineering	20	✓			
10	ENGG10084	Energy Systems Analysis and Design	20		✓		
10	ENGG10044	Process Dynamics and Control	20		✓		
10	ENGG10032	Unit Operations 2	20	✓			

* Indicates that module descriptor is not published.
Footnotes for Core Modules:

N/A

Learning Outcomes - Level 10 Optional Modules

SCQF Level		Module Name	Credit	Term	Footnotes

	Module Code			1	2	3	

* Indicates that module descriptor is not published.
Footnotes for option modules

N/A

22d	Level 10 Criteria for Award
	To progress from SCQF 10 to SCQF 11 in this programme, students are normally required to obtain 480 credits from the above programme and achieve an average of all modules of =60% at SCQF Level 10. Students obtaining 480 credits of which 240 are at SCQF 9 and SCQF 10 from the above programme including all core module but do not satisfy the requirements for progression to Level 11 are eligible for the BEng Hons Chemical Engineering Award. The Classification of Honours will be determined by University Regulation 3.20-3.24. Students must have obtained a pass in all modules listed as pre-requisites. Standard University guidelines will be followed to decide on honours degree classification. At least 480 credits are required with at least 240 in the subject area at SCQF level 9 and SCQF level 10 of which a minimum of at least 120 are at SCQF level 10, in line with PSRB requirements for an accredited degree. Any student who fails to satisfy this criterion could be awarded a BSc Hons degree in Chemical Engineering subject to University regulations. (At least 480 credits are required with 200 in the subject area at SCQF level 9 and SCQF level 10 with a minimum of 100 at SCQF level 10 including all the core modules for the BSC Hons award). If a student completes at least 36 weeks of work placed learning the student is eligible for the 'sandwich award' title. Links: UWS Regulatory Framework; and Student Experience Policy Statement.

	SCQF LEVEL 11 Learning Outcomes (Maximum of 5 per heading)
Knowledge and Understanding	
A1	A Critical knowledge that covers and integrates most of relevant science and technology related to the design of process equipment and systems and their relevance and application in the chemical process industry context and at advance level.
A2	A critical understanding and embedment of the main theories, concepts and principles within Chemical Engineering towards the practice of the profession.
A3	Comprehension, appreciation and critical understanding of a range of specialised theories applied to the dynamic nature of Chemical Engineering knowledge towards understanding each individual design and complete process.
A4	Extensive, detailed and critical knowledge and understanding of the role of the chemical engineer in an integrated chemical process that takes account of other issues such as the environment, sustainability and resources conservation.
A5	Develop a critical understanding of the implication of knowledge of chemical engineering principles in the advancement of modern and innovative chemical processes design, conservation of resources and sustainability.
Practice - Applied Knowledge and Understanding	
B1	Use a significant range of the core chemical engineering knowledge and skills to advance the knowledge of chemical process design and its application in chemical process context.
B2	Develop the ability to use a range of specialised skills, techniques, practices and/or materials that are informed by the recent advances in the fields of chemical engineering.
B3	Apply a range of standard and specialised research and other techniques to advance the understanding of chemical process design.
B4	Plan, develop and execute a relevant design based on advanced knowledge, research and innovation within a wide and often changeable variety of economic, legal and environmental constraints in the field of chemical and process engineering.
B5	Apply advanced scientific knowledge in a wide variety of chemical process applications that demand innovation.
Communication, ICT and Numeracy Skills	
C1	Communicate, using appropriate methods, to a range of audiences with different levels of knowledge/expertise.
C2	Communicate with peers, more senior colleagues and specialists.

C3	Use a wide range of ICT applications to support and enhance work at this level and show critical understanding of the scope and limitations of the tools used and their underlying theoretical basis.
C4	Undertake critical evaluations of a wide range of numerical and graphical data with the ability to deal with situations involving missing data and lack of information using research.
Generic Cognitive Skills - Problem Solving, Analysis, Evaluation	
D1	Apply critical analysis, evaluation and synthesis to forefront issues, or issues that are informed by forefront developments in the area of chemical engineering and the interaction with the other aspects of chemical process design such as environmental protection, safety, ethics and sustainability.
D2	Practice at a high level the ability to critically identify, analyse, conceptualise and define new and abstract problems related to chemical process design and the application of the concepts in a Chemical Engineering context.
D3	Develop and demonstrate original and creative thinking and responses in dealing with complex or novel problems and issues related to the design of chemical processes.
D4	Critically review, consolidate and extend knowledge, skills, practices and thinking in the field of chemical process design.
D5	Deal with complex issues and make informed judgements in situations where there is absence of complete or consistent data/information through innovation and research.
Autonomy, Accountability and Working With Others	
E1	Exercise high level of autonomy and initiative in professional and equivalent activities with the ability to work independently on significant and demanding tasks.
E2	Take responsibility for own work and/or significant responsibility for the work of others providing leadership.
E3	Demonstrate leadership and/or initiative and make an identifiable contribution to change and development.
E4	Practise in ways which draw on critical reflection on own and others' roles and responsibilities.
E5	Deal with complex ethical and professional issues in engineering context and make informed judgements on issues not addressed by current professional and/or ethical codes or practices.

Learning Outcomes - Level 11 Core Modules

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

11	ENGG11033	Advanced Fluid Mechanics and CFD	20	✓			
11	ENGG11032	Advanced Heat Transfer and Energy Recovery	20	✓			
11	ENGG11036	Advanced Reactor Design	20		✓		
11	ENGG11051	M Eng Chemical Engineering Research Project	20	✓	✓		
11	ENGG11037	Process Design, Sustainability and Safety	20	✓			
11	ENGG11039	Separation Processes	20		✓		

* Indicates that module descriptor is not published.
Footnotes for Core Modules:

N/A

Learning Outcomes - Level 11 Optional Modules

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

* Indicates that module descriptor is not published.
Footnotes for option modules

N/A

22d	**Level 11** **Criteria for Award**
	To be eligible for the award of MEng (Hons) degree a candidate must hold 600 credits, including 360 at SCQF Levels 9, 10 and 11 from the above programme. The Classification will take into account student's performance at Level 9, Level 10 and Level 11. The composite mark is given by: 20% from Level 9 30% from Level 10 50% from Level 11 The classification will be determined as follows: First Class =70% Average Upper Second Class (2.1) =60% Average Lower Second Class (2.2) =50% Average If a student completes at least 36 weeks of work placed learning the student is eligible for the 'Sandwich Award' title. Links: UWS Regulatory Framework; and Student Experience Policy Statement.

23	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.

24	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 a Combined Studies award (please see Regulation 1.61).

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.

Change/Version Control

Changes made to the programme since it was last published:

V03

Admissions criteria updated to reflect current requirements.
Applied Mathematics 1 (New module) in T1 added lieu of Mathematics for Engineering 1 (T1 & T2).
ENGG07002 Applied Engineering Science delivery changed to T2 was T1 & T2.

v.02

Programme Leader Updated to Dr Mojtaba Mirzaeian
General Overview updated to reflect full return to campus delivery.
Admissions criteria updated to reflect current requirements.
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).

v.01

Merging content of two 10 credit modules each at levels 9 and 10 to two 20 credit modules.
Replacement of L7 Introduction to Process Industries with Technical Communications to meet the same learning outcomes.
Text demonstrating alignment of programme with UWS Curriculum Framework added.

Version Number: 1.12