**University of Huddersfield**

**Programme Specification**

## *This document does not form part of the student contract*

|  |  |  |
| --- | --- | --- |
| **1.** | **Awarding institution** | University of Huddersfield |
| **2.** | **Teaching institution**  | University of Huddersfield |
| **3.** | **School and Department** | School of Applied SciencesDepartment of Chemical Sciences |
| **4.** | **Course accredited by** | The Institution of Chemical Engineers (IChemE) |
| **5.** | **Mode of Delivery** | Full Time (3 years)Full Time with SWE (4 years) |
| **6.** | **Final Award** | Bachelor of Engineering with Honours BEng(Hons) |
| **7.** | **Course Title** | BEng (Hons) Chemical Engineering, BEng (Hons) Chemical Engineering with Chemistry |
| **8.** | **UCAS Code** |  |
| **9.** | **Subject benchmark statement** | [QAA Engineering Benchmark Statement 2019](https://www.qaa.ac.uk/search-results?indexCatalogue=global&searchQuery=Engineering&wordsMode=AllWords)[UK Standard for Professional Engineering Competence (UK-SPEC).](https://www.engc.org.uk/ukspec.aspx)[The Accreditation of Higher Education programme UK Standard for Professional Engineering Competence Third edition](https://www.engc.org.uk/engcdocuments/internet/Website/Accreditation%20of%20Higher%20Education%20Programmes%20third%20edition%20%281%29.pdf)[Accreditation of chemical engineering programmes Version 5](https://www.icheme.org/media/13279/accreditation-guidance-v50_feb20.pdf) |
| **10.** | **Date of Programme Specification****Approval** | July 2015Revised: September 2020Revised: July 2022Revised: March 2023 |

**11. Educational Aims of the Courses**

The course aims include both the University of Huddersfield Graduate Attributes for all taught degree courses and specific course aims for the BEng(Hons) Chemical Engineering and BEng(Hons) Chemical Engineering with Chemistry.

All taught degree courses enable graduates to develop the following attributes core to the University of Huddersfield.

University of Huddersfield Graduate Attributes:

1. Self-motivated

2. Commercially aware

3. Enterprising

4. Resilient

5. An effective collaborator

6. A confident leader

7. Globally and socially aware

8. Plans growth and development

11.1 The chemical industry is one of the most important industrial sectors in the UK and employs large numbers of process and chemical engineers. There has always been a high demand for qualified graduates from each of these areas to work in the petroleum, pharmaceutical and other chemical manufacturing sectors. An increasing awareness of the environment and increasing legislation to control the degree of pollution, and to meet future energy needs, has also led to a greater demand for chemical engineers.

The courses build~~s~~ upon a very strong Chemistry Department (around 16th largest in undergraduate numbers in England) and strong links with industry through research and enterprise activities, student placements and part-time courses. Options in Chemical Engineering have been offered at the University for nearly 50 years, including a BSc(Hons) Chemical Engineering and Chemistry. The BEng(Hons) Chemical Engineering degree~~s~~ and the BEng(Hons) Chemical Engineering with Chemistry degree, build upon this expertise and tradition utilising our dedicated Chemical Engineering teaching facilities.

The BEng(Hons) Chemical Engineering course provides highly numerate graduates with strong chemical engineering knowledge while the BEng(Hons) Chemical Engineering with Chemistry programmes gives particular strengths in chemistry principles and fine chemicals manufacture. The two programmes have five common module in the first year, facilitating switching between programmes as students learn more about their respective content and features during their first year. Career progression may occur through further specialism into Chemical Engineering at master’s level, or through direct employment into the chemical engineering, petrochemical, process development and related sectors. Chemical Engineering graduates, as well as being knowledgeable about their own subject, are also trained in other transferable skills, allowing them to proceed into other careers that value highly trained numerate graduates with good problem solving skills, including finance, law, teaching and sales.

*The main aims of the programme are to:*

1. instil into students an appreciation of the importance of chemical engineering and chemistry to the chemical industry and to prepare the student for a career in the industry.
2. provide knowledge in the branches of chemistry that are most relevant to the chemical engineer (organic and physical) and knowledge of the key areas in chemical engineering (fluid flow, heat transfer, mass transfer, unit operations, reactor design).
3. provide training in the safe and competent use of laboratory equipment, pilot plant and unit operations.
4. develop in students an ability to apply their knowledge and skills to the solution of theoretical and practical problems in chemistry and chemical engineering.
5. develop, through an education in chemical engineering and chemistry, a range of transferable skills, including mathematical and IT skills, project management and design skills, problem solving skills and communication skills of value in chemical industry and non-chemical industry employment.
6. provide specialised knowledge in specific areas of chemical engineering recognised as required study by the Institution of Chemical Engineers (IChemE).

**12. Intended Learning Outcomes**

***Knowledge and Understanding***

Students will have knowledge and understanding of:

1. the main branches of chemistry that are relevant to the professional chemical engineer (physical chemistry and synthesis) and a knowledge of the key areas in chemical engineering (materials balance, energy balance, safety, fluid flow, heat transfer, mass transfer, solid fluid systems, pilot plant operation, unit operations and reactor design).
2. the mathematical principles and computing modelling skills that underpin current technologies relevant to chemical engineering.
3. specialist aspects of chemistry and chemical engineering (such as physical organic chemistry, synthetic design and reaction engineering)
4. design methodology that is at the forefront of the discipline through design project work.
5. the most recent developments in chemical engineering.
6. career opportunities, career progression and the engineer in industry.

***Professional/practical skills***

Students will be able to:

1. interpret essential facts, concepts, principles and theories in the main areas of chemical engineering and relevant areas of chemistry and develop arguments and make distinctions based upon these.
2. describe solutions to qualitative and quantitative problems of a familiar and unfamiliar nature and discriminate between different methodologies and approaches.
3. deploy, evaluate, interpret and generate engineering and chemical information and data.
4. appraise, devise and implement good health and safety practice, and plan for refining and developing the resultant evaluations.
5. illustrate technical and scientific results and conclusions clearly and correctly, in writing and orally, to a variety of audiences and show an ability to both question and exemplify the results.
6. apply computers to data processing, engineering design and retrieving scientific information
7. critically evaluate novel problems and plan and deploy strategies for their solution using techniques of which some are at the forefront of the discipline.
8. employ and handle chemicals and apply standard laboratory procedures safely.
9. demonstrate the correct use of standard instrumentation, pilot plants and unit operation facilities.
10. investigate chemical and physical properties, events or changes by observation and measurement, and exemplify the systematic and reliable recording of results.
11. interpret experimental results in terms of their significance and underlying theory.
12. produce risk assessments on chemical processes, laboratory procedures and pilot plant and unit operations, including awareness of the economic, ethical, social and environmental context.
13. create, design and execute practical investigations from the problem recognition stage through to the evaluation and appraisal of the results.

***Transferable/Key Skills***

Students will have:

1. interpersonal skills, including the ability to co-operate with others and work as part of a team.
2. numeracy and computational skills, including the use of general and specialist software.
3. verbal and written communication skills which show the ability to summarise scientific information and engineering data, interpret results, and compose, present and justify arguments.
4. time management, teamwork and organisational skills – the ability to initiate, co-ordinate and direct programmes of work and study, including a major group design project.
5. information retrieval skills, including on-line searches and primary literature research skills.
6. study skills for continuing personal development.

**13. Course Structures and Requirements, Levels, Modules, Credits and Awards**

**13.1** Comprehensive documentation giving module details, course structure and related matters is available online.

**13.2** The course is consistent with the University Credit Accumulation and Transfer Scheme (CATS) where modules are of 20 credits, delivered and assessed over one year. In the first year, modules are at foundation level (“F” level credits) and provide underpinning knowledge, competencies and skills for the later intermediate and honours level modules (“I” and “H” level credits, respectively) taken in later years. Students are required to take 120 “F” level credits in the first year, 120 “I” level credits in the second year and 120 “H” level credits in the final year. Students may take an optional placement in the third year, which carries 120 “S” level credits, giving a “Sandwich Award”.

N.B. In order to comply with the Engineering Council rules for compensation and condonement on accredited engineering programmes, only one module on this programme may be condoned.

Year 1 – First year modules cover fundamentals of core chemical engineering, including mass and energy balances, unit operations, heat transfer and fluid flow. In addition, underpinning scientific principles are introduced in physical and organic chemistry and engineering mathematics. These are designed to develop physicochemical principles and mathematical tools required for process engineering. The lectures and seminars are supplemented with relevant practical exercises. These modules have embedded within them skills intended to aid the understanding, manipulation, analysis and presentation of chemical and technical data. IT and communication skills are included. Students on the Chemical Engineering with Chemistry programme are also introduced in inorganic chemistry, while students on the Chemical Engineering programme are introduced to sustainability concepts.

All modules in Year 1 must be passed. No modules can be condoned.

**Year 1 - Full Time - Foundation Level**

|  |  |  |  |
| --- | --- | --- | --- |
| **Level** | **Module Code/Title** | **Credits** | **Type** |
| F (FHEQ 4) | SFC1002 Organic Chemistry 1 | 20 | Core |
| F (FHEQ 4) | SFC1003 Physical Chemistry 1 | 20 | Core |
| F (FHEQ 4) | SFC1017 Chemical Engineering Design 1*Pre-requisite for SIC2019* | 20 | Core |
| F (FHEQ 4) | SFC1018 Heat Transfer and Fluid Flow*Pre-requisite for SIC2017* | 20 | Core |
| F (FHEQ 4) | NFE2105 Mathematics 1 | 20 | Core |
| **Students taking Chemical Engineering** |  |  |
| F (FHEQ 4) | SFC1021 Chemical Engineering Labs and Sustainability | 20 | Core |
| **Students taking Chemical Engineering with Chemistry** |  |  |
| F (FHEQ 4) | SFC1020 Chemical Engineering Labs and Inorganic Chemistry | 20 | Core |

Year 2 – Core chemical engineering topics in mass transfer, chemical thermodynamics, chemical and biochemical reaction engineering, particle technology and solid-fluid systems are covered in the second year of the programme, with options in fine chemical production or manufacturing and enterprise. A key focus is the chemical process industry and students undertake practicals focusing upon key reactions and separations in chemicals manufacture. Important aspects of professional development are brought into focus, with a clear aim to develop both chemical engineering skills and generic transferable skills. Process safety, economics and engineering codes of practice are introduced.

**Year 2- Full Time - Intermediate Level**

|  |  |  |  |
| --- | --- | --- | --- |
| **Level** | **Module Code/Title** | **Credits** | **Type** |
| F (FHEQ 5) | SIC2003 Physical Chemistry 2 | 20 | Core |
| F (FHEQ 5) | SIC2017 Transport Processes and Unit OperationsPre-requisite for SHC4035 | 20 | Core |
| F (FHEQ 5) | SIC2019 Chemical Engineering Design 2 | 20 | Core |
| F (FHEQ 5) | SIC2023 Chemical and Biochemical Reaction EngineeringPre-requisite for SHC4035 | 20 | Core |
| F (FHEQ 5) | SIC2025 Multiphase Systems | 20 | Core |
| F (FHEQ 5) | SIC2002 Organic Chemistry 2(core for students taking Chemical Engineering with Chemistry) | 20 | Core/Optional |
| F (FHEQ 5) | SIC2027 Biofuels and Biochemistry | 20 | Optional |

Year 3 – Optional Supervised Work Experience is a one-year placement in a commercial company, governmental organisation, research establishment or university setting. This is an important part of the BEng(Hons) course which all students would normally be expected to undertake as it is an invaluable learning opportunity, providing an excellent platform from which to seek employment. However, direct progression into the final year is possible, and a placement is not compulsory. Students are provided with support and advice in finding and applying for a position via timetabled weekly sessions from the SWE tutor and the teaching team. Positions are sought and advertised via the SWE tutor and dedicated school SWE office, and students are appointed to positions after interviews with potential employers. Progress is followed and monitored throughout the year in the form of visits by the University Supervisor to the host institution to meet and discuss progress with the student and Workplace Supervisor. At the end of the placement students submit a report and give an oral presentation.

|  |  |  |  |
| --- | --- | --- | --- |
| **Level** | **Module Title** | **Credits** | **Type** |
| I (FHEQ 5) | SSC3001 Supervised Work Experience | 120 | Optional |

Year 4 - Systems thinking and skills dominate the final year of the BEng programme. An advanced chemical engineering capstone design project allows students to work in groups on a substantial task that integrates knowledge from across the curriculum. Process integration and pinch analysis are introduced, along with process control and safety engineering, and an emphasis on sustainability tools and techniques. Advanced unit operations including mass transfer and reactor design build on earlier skills and knowledge. Students on the Chemical Engineering with Chemistry programme build further knowledge in organic chemistry, while students on the Chemical Engineering programme access modules covering advanced energy systems or projects and production management.

N.B. In order to comply with the Engineering Council rules for compensation and condonement on accredited engineering programmes, major group-based project modules (SHC4038 and SHC4039) cannot be condoned.

**Final Year Full Time - Honours Level**

|  |  |  |  |
| --- | --- | --- | --- |
| **Level** | **Module Code/Title**  | **Credits** | **Type** |
| F (FHEQ 6) | SHC4038 Design Project 1 | 20 | Core |
| F (FHEQ 6) | SHC4039 Design Project 2 | 20 | Core |
| F (FHEQ 6) | SHC4032 Safety Engineering and Process Control | 20 | Core |
| F (FHEQ 6) | SHC4035 Advanced Mass Transfer & Reaction Engineering | 20 | Core |
| F (FHEQ 6) | SHC4037 Sustainable Industrial Systems | 20 | Core |
| **Students taking Chemical Engineering** |  |  |
| F (FHEQ 6) | NHM2405 Advanced Energy Systems | 20 | Optional |
| F (FHEQ 6) | NHM2420 Project Quality and Production Management | 20 | Optional |
| **Students taking Chemical Engineering with Chemistry** |  |  |
| F (FHEQ 6) | SHC4002 Organic Chemistry 3 | 20 | Core |

BEng(Hons) Chemical Engineering or BEng (Hons) Chemical Engineering with Chemistry can be awarded upon successful completion of modules that give the student 360 credits of which no more than 120 must be at Foundation level, and at least 120 must be at Honours level. Students must normally have achieved 100 credits to progress to the relevant next stage each year; however, in compliance with Engineering Council rules, only one module can be condoned the final two taught years of the programme.

At Honours level a student should be able to demonstrate an ability to engage in effective literature research; to analyse specific problems or issues; critically evaluate/appraise using given criteria and to formulate original ideas or innovative proposals.

The class of award is determined at the Course Assessment Board in accordance with the guidelines outlined in the “Regulations for Awards (taught courses): Section E” on the Registry website as follows: <https://www.hud.ac.uk/policies/registry/awards-taught/section-e/>

**13.3** **Interim Awards**

Students who are unable or do not wish to complete the Honours programme are able to gain intermediate awards (in Chemical Engineering) determined by the number and type of credits as follows:

**Certificate of Higher Education**  120 “F” credits

**Diploma of Higher Education** 120 “F” credits + 120 “I” credits

**BEng** 120 “F” credits + 180 “I”/”H” credits

(at least 60 “H” credits)

**14. Teaching, Learning and Assessment**

**14.1** Modules are delivered over two terms with normally three hours formal contact per week per module. Practical sessions are normally 3 or 4 hours. A variety of teaching methods are used, including lectures, tutorials, workshops, problem solving sessions, seminars, practicals and directed reading. The University’s Virtual Learning Environment, Brightspace, is widely used for communication and the provision of supporting material. Individual student-centred learning is achieved by the use of structured assignments, workbooks for practicals and IT-based resources.

Most modules are assessed through coursework and practicals (during the year) with a formal unseen examination in the third term. Coursework is made up mainly from assessment of practical work, practical based laboratory reports, problem solving assignments (including cross-curricular) and short tests, as well as a small number of essays, oral and poster presentations. Formative tests are widely used, especially in the first year. An assessment schedule (Appendix 4) is given to all students at the start of the academic year.

**15. Support for Students and their Learning**

**15.1** Support for students undertaking this course operates at University, School and Course level as follows:

**15.2 University Level**

**15.2.1** Central to the provision of student support are **Student Services**. The range of services they offer include:

## 15.2.2 Wellbeing and Disability Services

* [Counselling](https://students.hud.ac.uk/help/wellbeing/support/counselling/)
* [Back on Track](http://www.hud.ac.uk/wellbeing/back-on-track/)
* [Disability Services](http://www.hud.ac.uk/disability-services/)
* [Wellbeing](http://www.hud.ac.uk/wellbeing/)
* [The Faith Centre](https://students.hud.ac.uk/help/faith/faith-centre/)
* [Getting help](https://students.hud.ac.uk/help/ipoint/)
* [Group workshops and courses](https://students.hud.ac.uk/help/wellbeing/support/workshops-and-groups/)
* [Hate Crime Reporting Centre](https://students.hud.ac.uk/help/wellbeing/report-and-support/support/hate-crimes/)
* Help for suspended students
* [Self help](https://students.hud.ac.uk/help/wellbeing/247support/self-help-guides/)
* [Student parents](https://students.hud.ac.uk/help/wellbeing/student-parents/)
* [Welfare support](https://students.hud.ac.uk/help/wellbeing/)
* [University Health Centre](http://www.universityhealthhuddersfield.co.uk/)

**15.2.3** [Careers and Employability Service](https://students.hud.ac.uk/opportunities/careers/)

An integral part of the students’ Personal development and careers support is provided by the University’s Global Professional Award (GPA). This CMI accredited course runs alongside the academic modules and integrates aspects of well-being, career planning and global awareness.

**15.2.4** **The Student Finance Office** provides:

* Information and guidance regarding possible sources of funding for all courses in the University.
* Budgeting advice to discuss a variety of options and strategies in order to manage on a budget.
* Facilities for the billing and payment of income to be collected by the University.
* Debt advice via personal and confidential sessions is available from trained staff along with mediation and resolution.

Further information can be found on their website at: <http://www.hud.ac.uk/students/finance>

**15.2.5** **Computing services** provide induction and ongoing support for all students. More information on the range of computing services can be found on their website at:

<http://students.hud.ac.uk/it/>

**15.2.6 Library** **Services** provide induction and ongoing support for all students. More information on the range of library services can be found on their website at: <http://www.hud.ac.uk/library/>

**15.2.7** [**Students’ Union**](https://www.huddersfield.su/)

**15.2.8** [**International Office**](https://www.hud.ac.uk/international/)provides help and support for all overseas students.

**15.2.9** [**Accommodation**](https://www.hud.ac.uk/uni-life/accommodation/)

**15.2.10** [**Sports facilities**](https://sport.hud.ac.uk/)

**15.3 School Level**

**15.3.1** The School of Applied Sciences provides additional student support using a variety of approaches:

* + 1. Induction Week
		2. Personal Academic Tutor (PAT) assigned to each student who maintains regular contact with the student throughout each academic session, especially at key times of the year for Personal Development Planning (PDP).
		3. PDP meetings (the recommended minimum of meetings being at: Induction; Term 1; Term 2; Term 3; Results Day).
		4. **Support and Guidance Officers** work with the University Student Support systems to provide pastoral support as required.
		5. **School Student Support Office** (Room JPGS/25) for course enquiries.
		6. **Academic Skills tutors** can give one to one support to students requiring help with study skills.

**15.3.8** Student attendance is monitored in accordance with the University regulations.

**15.4 Course Level**

* + 1. At course level support is provided as follows
		2. Induction programme at the beginning of the academic year during which groups will be formed and briefed on developing ‘Action Learning Sets.’
		3. Academic mentoring.
		4. Year/Module Tutors available to help with module-specific academic issues
		5. Supporting documentation is provided online in the form of Course Handbooks, Module Handbooks, and Programme and Module specifications.
		6. [Brightspace](https://brightspace.hud.ac.uk/d2l/login) virtual learning environment.
		7. Specialised computing laboratories and science laboratories.
		8. Student e-mail and access to teaching staff, including the Head of Department and the Course Leader. Students with academic concerns regarding course matters and/or personal matters should contact the Course Leader, who will either counsel them directly in the first instance or direct them to the appropriate support service.

**15.5** **International students**

In recognition of the needs of overseas students, the following additional structures are provided:

* All overseas students will undertake a 1-day induction programme prior to commencing the Induction activities for all students on the Course. Research and Feedback have identified the need to cover certain topics in more depth to immerse international learners fully into the Higher Education learning environment in the UK.
* During the International Induction, further assessment of English ability will take place to identify individual learners who may require specific English Language Support during their first term. Such learners are provided with ELS classes alongside modules.

**16. Criteria for Admission**

**16.1** The University of Huddersfield seeks and encourages applicants in order to widen participation, improve access and apply the principles of equal opportunities. We provide support for applicants who require additional assistance in order to select the right course of study and make a successful transition to studying at University. We encourage local, national and international applications. Further information for International Students can be found on:

 <http://www.hud.ac.uk/international>

 If you were educated outside the UK, you are required to have International English Language Testing System (IELTS) at a score of 6.0 with a minimum score of 6.0 in writing and a minimum of 5.5 in any single component. The International Office offers guidance on country-specific entry requirements. If you have alternative qualifications or do not meet the IELTS requirement the University also offers a range of [Pre-Sessional English Programmes.](http://www.hud.ac.uk/international/pre-sessionalenglishprogramme/)

**16.2** The University provides opportunities for the accreditation of prior learning (APL) as stated at the following link: <https://www.hud.ac.uk/policies/registry/awards-taught/section-c/>

**16.3** The University’s general minimum entry requirements are specified in Section D of the Regulations for Awards (taught students)which can be found on the University website as follows: <https://www.hud.ac.uk/policies/registry/awards-taught/section-d/>

**16.4** Every person who applies for this course and meets the minimum entry requirements, regardless of any disability, will be given the same opportunity in the selection process. General advice and information regarding disability and the support the University can give can be found by contacting student services as follows:

Telephone**:** 01484 472675

Email: disability@hud.ac.uk

Further information is available at their website at:

<http://students.hud.ac.uk/wellbeing-disability-services/disabilityservices>

Further advice on the specific skills and abilities needed to successfully undertake this course can be found by visiting the website <http://www.hud.ac.uk/courses/> and by contacting the admissions tutor.

* 1. However, the specific entry requirements and admission criteria for the courses are detailed below:

**16.5.1** The admissions process is in conjunction with other courses of the chemical sciences suite.

 It is desirable that candidates have GCSE Grade C or above in English and Mathematics and an approved science subject – either Physics, Chemistry or Double Award Science.

**16.5.2** For entry to the undergraduate degree candidates normally will have:

* a UCAS Tariff of 120 points consisting of awards that equate to 40 points in maths (grade B ‘A’ level mathematics, or its equivalent) and 32 points in either chemistry or physics (grade C ‘A’ level chemistry or physics, or their equivalent);
* Passes in 5 subjects at GCE/VCE/AVCE/GCSE including at least one 12 unit award in Chemistry plus a 12 unit award in Maths, or

*OR*

* Successfully completed the University of Huddersfield Science Extended Degree Year with a mark of with a mark of 60% overall, 60% in the Maths and Physics module and 60% in the Chemistry module,

 *OR*

* Advanced, level 3, GNVQ or NVQ at an appropriate level,

*OR*

* Other qualifications deemed by the School to be acceptable, for example:
	+ 1. International Baccalaureate (IB) Diploma

30 points in International Baccalaureate Diploma with grade 5 in higher level subjects, which must include chemistry and mathematics.

**16.5.4** Scottish Highers

Must achieve AABBB to include a minimum of A in Mathematics and A in Chemistry.

**16.5.5** Scottish Advanced Highers

Must achieve BBB to include a minimum of B in Mathematics and B in Chemistry.

**16.5.6** Irish Leaving Certificate

Pass six subjects at higher level with grades A to B, to include A in Chemistry and A in Mathematics.

**16.5.7** Mature students, without formal qualifications may apply for admission and potential students are advised to contact the Admissions Tutor for further guidance on individual circumstances.

**16.5.8** Entry to different stages is possible for this course. At least 33% of the total credits for an award must be obtained through study at the University of Huddersfield.

Normally candidates will be at least 18 years of age by 31st December of the year of entry.

**17. Methods for Evaluating and Improving the Quality and Standards of Teaching and Learning**

**17.1 University:** The methods for the validation and annual evaluation of courses, including those validated by external bodies, and for the review of teaching and research and of academic support services are specified in the University’s; Quality Assurance Procedures for Taught Courses and Research Awards which can be found on the University website as follows:

 <https://www.hud.ac.uk/policies/registry/qa-procedures/>

**17.1.1 Periodic reviews**

**17.1.2 External examiner system**

**17.1.3 University Teaching and Learning Committee**

**17.1.4 Mechanisms for student feedback** (including independent student satisfaction survey)

**17.1.5 Institutional staff development courses**

**17.2 School:**

**17.2.1 Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards**

* Course and module reviews (student evaluations and staff report)
* Annual course evaluation report prepared by the Course Leader and considered by Course Committee and School Annual Evaluation Committee
* Peer observation of teaching
* External Examiners' reports
* PSRB requirements

**17.2.2 Committees with responsibility for monitoring and evaluating quality and standards**

* Student Panel
* Course Committee
* School of Applied Sciences Teaching and Learning Committee
* School of Applied Sciences Annual Evaluation Committee
* Course Assessment Board.

**17.2.3 Mechanisms for gaining student feedback on the quality of teaching and their learning experience**

* Student representation on Course Committee
* Student evaluation of modules.

**17.2.4 Staff development priorities include:**

* Staff Personal Development Review
* Updating professional developments
* Regular course meetings and annual review and planning for subsequent academic year.

**18. Regulation of Assessment**

**18.1** University awards are regulated by the Regulations for Awards on the University website as follows: <https://www.hud.ac.uk/policies/registry/awards-taught/> and the Regulations for Taught Students, procedures and forms can be accessed on the University website as follows:

 <https://www.hud.ac.uk/registry/current-students/taughtstudents/>

**18.2 Role of External Examiners**

 External Examiners are appointed by the University Learning and Teaching Committee.

The role of the External Examiner is that of moderator. In order to do this they:

* approve examination papers
* review coursework and examination scripts
* interview borderline candidates for award
* attend the Course Assessment Board.

**19. Indicators of Quality and Standards**

* Annual course reviews
* External examiners’ reports
* Qualifications and experience of staff
* Reports of validation panels
* Periodic Review
* Subject Review
* Qualifications and experience of staff
* Recognition by IChemE for accredited status

**Appendix 1 - Mapping of module learning outcomes to course learning outcomes for all modules (including optional modules)**

**Year 1 Full Time - Foundation Level**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Learning Outcome  | SFC1002 | SFC1003 | SFC1017Compulsory  | SFC1018Compulsory | SFC1020 | NFE2105 | SFC1021 |
| 1 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| 2 |  |  | ✔ | ✔ |  | ✔ |  |
| 3 |  |  |  |  | ✔ |  | ✔ |
| 4 |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |
| 6 |  |  | ✔ | ✔ |  |  |  |
| 7 | ✔ | ✔ | ✔ | ✔ | ✔ |  | ✔ |
| 8 | ✔ | ✔ | ✔ | ✔ |  | ✔ |  |
| 9 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| 10 |  |  | ✔ | ✔ |  |  |  |
| 11 | ✔ | ✔ | ✔ | ✔ | ✔ |  | ✔ |
| 12 |  |  | ✔ | ✔ |  |  |  |
| 13 |  |  |  |  |  |  |  |
| 14 | ✔ | ✔ |  |  | ✔ |  | ✔ |
| 15 |  | ✔ | ✔ | ✔ |  |  |  |
| 16 | ✔ | ✔ |  |  | ✔ |  | ✔ |
| 17 | ✔ | ✔ | ✔ | ✔ | ✔ |  | ✔ |
| 18 |  |  |  |  |  |  |  |
| 19 |  |  |  |  |  |  |  |
| 20 |  | ✔ | ✔ | ✔ | ✔ |  | ✔ |
| 21 |  | ✔ |  |  |  | ✔ | ✔ |
| 22 | ✔ | ✔ | ✔ | ✔ | ✔ |  | ✔ |
| 23 | ✔ | ✔ | ✔ | ✔ |  | ✔ |  |
| 24 |  |  |  |  | ✔ |  | ✔ |
| 25 |  |  |  |  |  |  |  |

**Year 2 Full Time - Intermediate Level**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Learning Outcome | SIC2003 | SIC2017Compulsory | SIC2019 | SIC2022 | SIC2023Compulsory | SIC2025 | SIC2027 |
| 1 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| 2 | ✔ | ✔ | ✔ |  |  | ✔ |  |
| 3 |  |  | ✔ | ✔ |  |  | ✔ |
| 4 |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |
| 6 |  |  | ✔ |  |  |  | ✔ |
| 7 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| 8 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| 9 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |  |
| 10 |  |  | ✔ |  | ✔ |  |  |
| 11 |  |  | ✔ |  |  |  | ✔ |
| 12 |  | ✔ | ✔ |  |  |  |  |
| 13 |  |  | ✔ |  | ✔ |  | ✔ |
| 14 | ✔ |  |  | ✔ | ✔ | ✔ |  |
| 15 |  | ✔ | ✔ |  |  |  |  |
| 16 | ✔ |  |  | ✔ |  | ✔ |  |
| 17 | ✔ |  | ✔ | ✔ |  | ✔ |  |
| 18 |  | ✔ | ✔ |  |  |  |  |
| 19 |  |  |  |  |  |  |  |
| 20 | ✔ | ✔ | ✔ |  |  | ✔ | ✔ |
| 21 | ✔ | ✔ | ✔ |  |  | ✔ |  |
| 22 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| 23 | ✔ | ✔ | ✔ | ✔ |  | ✔ | ✔ |
| 24 | ✔ |  | ✔ | ✔ |  | ✔ | ✔ |
| 25 | ✔ | ✔ | ✔ | ✔ |  | ✔ | ✔ |

**Final Year - Honours Level**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Learning Outcome | SHC4002 | SHC4038 and SHC4039 | SHC4032 | SHC4035 | SHC4037 | NHM2405 | NHM2420 |
| 1 | ✔ |  | ✔ | ✔ | ✔ |  |  |
| 2 |  | ✔ |  |  |  | ✔ | ✔ |
| 3 | ✔ |  |  | ✔ |  | ✔ |  |
| 4 | ✔ | ✔ |  |  |  |  |  |
| 5 | ✔ | ✔ |  | ✔ |  | ✔ | ✔ |
| 6 |  | ✔ |  | ✔ |  |  |  |
| 7 | ✔ |  | ✔ | ✔ | ✔ | ✔ | ✔ |
| 8 | ✔ |  | ✔ | ✔ | ✔ | ✔ | ✔ |
| 9 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| 10 |  | ✔ | ✔ |  | ✔ |  |  |
| 11 |  | ✔ |  |  |  | ✔ | ✔ |
| 12 |  | ✔ |  | ✔ |  |  | ✔ |
| 13 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| 14 |  | ✔ | ✔ |  |  |  |  |
| 15 |  | ✔ |  |  |  |  |  |
| 16 |  | ✔ |  |  |  |  |  |
| 17 |  | ✔ |  |  |  |  |  |
| 18 |  | ✔ |  | ✔ |  |  |  |
| 19 |  | ✔ |  |  |  | ✔ |  |
| 20 |  | ✔ |  | ✔ |  |  | ✔ |
| 21 | ✔ | ✔ |  | ✔ |  | ✔ | ✔ |
| 22 | ✔ | ✔ | ✔ |  | ✔ | ✔ | ✔ |
| 23 |  | ✔ |  |  |  |  | ✔ |
| 24 |  | ✔ |  |  |  |  | ✔ |
| 25 |  | ✔ |  |  |  | ✔ | ✔ |
|  |  |  |  |  |  |  |  |

**Appendix 2 -** **Mapping of Learning Outcomes to Benchmark Statement**

As detailed in the QAA Subject Benchmark Statement for Engineering (2019), <https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/subject-benchmark-statement-engineering.pdf>

the UK-SPEC [the *UK Standard for Professional Engineering Competence* (2014)] lists the output standards for a Bachelors Degree for CEng: [https://www.engc.org.uk/engcdocuments/internet/Website/Accreditation%20of%20Higher%20Education%20Programmes%20third%20edition%20(1).pdf](https://www.engc.org.uk/engcdocuments/internet/Website/Accreditation%20of%20Higher%20Education%20Programmes%20third%20edition%20%281%29.pdf)

These standards relate to underpinning science and mathematics and associated engineering disciplines as defined by the relevant engineering institution: (1) Science and mathematics; (2) Engineering Analysis; (3) Design; (4) Economic, Legal, Social, Ethical and Environmental Context; (5) Engineering Practice; and (6) Additional General Skills. These map as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| BENCHMARK STATEMENT(output standard)  | (1) | (2) | (3) | (4) | (5) | (6) |
| LEARNING OUTCOME |  |  |  |  |  |  |
| 1 | ✔ | ✔ |  |  |  |  |
| 2 | ✔ | ✔ |  |  |  |  |
| 3 | ✔ | ✔ |  |  |  |  |
| 4 |  |  | ✔ | ✔ |  | ✔ |
| 5 |  |  | ✔ | ✔ |  |  |
| 6 |  |  |  | ✔ | ✔ |  |
| 7 | ✔ |  | ✔ |  |  |  |
| 8 |  |  | ✔ |  |  |  |
| 9 | ✔ |  | ✔ |  |  |  |
| 10 |  |  | ✔ |  |  |  |
| 11 |  |  | ✔ | ✔ |  |  |
| 12 |  |  | ✔ | ✔ |  |  |
| 13 |  |  | ✔ | ✔ |  |  |
| 14 | ✔ |  |  |  |  |  |
| 15 |  |  |  |  |  | ✔ |
| 16 | ✔ |  |  |  |  |  |
| 17 |  |  |  |  |  | ✔ |
| 18 |  |  |  |  | ✔ | ✔ |
| 19 |  |  |  |  |  | ✔ |
| 20 |  |  |  | ✔ | ✔ |  |
| 21 |  | ✔ |  | ✔ |  | ✔ |
| 22 |  |  |  | ✔ |  |  |
| 23 |  |  |  | ✔ |  |  |
| 24 |  |  |  |  |  | ✔ |
| 25 |  |  |  |  | ✔ | ✔ |

The Institute of Chemical Engineers (IChemE) produces the following document (Feb 2020) that includes specific guidance on BEng programmes for Chemical Engineering; our syllabus is designed to meet this guidance.

<https://www.icheme.org/media/13279/accreditation-guidance-v50_feb20.pdf>

**Appendix 3 - Assessment schedule**

**YEAR ONE – FOUNDATION LEVEL MODULES**

|  |  |  |  |
| --- | --- | --- | --- |
| **Module** **Code** | **Module Title** | **Assessment Weighting** | **Assessment Strategy** |
| **Exam** | **C/W** |
| **practical** | **other** |
| SFC1002 | Organic Chemistry 1 | 60 | 20 | 20 | 2 hr exam, lab reports, assignment  |
| SFC1003 | Physical Chemistry 1 | 60 | 20 | 20 | 2 hr exam, lab reports, test  |
| SFC1017 | Chemical Engineering Design 1  | 60 |  | 40 | 2 hr exam, numerical and computing exercises |
| SFC1018 | Heat Transfer and Fluid Flow  | 75 |  | 25 | 2 hr exam, test, coursework assignment, online quizzes |
| SFC1020 | Chemical Engineering Labs and Inorganic Chemistry | 50 | 40 | 10 | 2 hr exam, lab reports, coursework |
| SFC1021 | Chemical Engineering Labs and Sustainability | - | 50 | 50 | Lab reports, coursework |
| NFE2105 | Mathematics 1 |  |  | 100 | coursework, 2 x tests  |

**YEAR TWO – INTERMEDIATE LEVEL MODULES**

|  |  |  |  |
| --- | --- | --- | --- |
| **Module****Code** | **Module Title** | **Assessment Weighting** | **Assessment Strategy** |
| **Exam** | **C/W** |
| **practical** | **other** |
| SIC2003 | Physical Chemistry 2 | 60 | 25 | 15 | 2.5 hr exam, lab reports, test  |
| SIC2017 | Transport Processes and Unit Operations | 60 | 20 | 20 | 2.5 hr exam, lab reports, test or assignment |
| SIC2019 | Chemical Engineering Design 2 | 60 |  | 40 | 2.5 hr exam, coursework |
| SIC2002 | Organic Chemistry 2 | 60 | 25 | 15 | 2.5 hr exam, lab reports, assignment |
| SIC2023 | Chemical and Biochemical Reaction Engineering | 40 | 20 | 40 | 2 hr exam, lab reports, assignment, test |
| SIC2025 | Multiphase Systems  | 60 |  | 40 | 2.5 hr exam, coursework |
| SIC2027 | Biofuels and Biochemistry | 80 | 10 | 10 | 2.5 hr exam, lab reports, assignment |

**FINAL YEAR – HONOURS LEVEL MODULES**

|  |  |  |  |
| --- | --- | --- | --- |
| **Module****Code** | **Module Title** | **Assessment Weighting** | **Assessment Strategy** |
| **Exam** | **C/W** |
| **practical** | **other** |
| SHC4002 | Organic Chemistry 3  | 45 |  | 55 | 2 hr exam, test, continual assessment |
| SHC4038 and SHC4039 | Design Project 1 and 2 | 20 | 80 | Design portfolio, presentation, coursework, 2-hour exam |
| SHC4032 | Safety Engineering and Process Control | 0 |  | 100 | In class tests, coursework |
| SHC4037 | Sustainable Industrial Systems | 70 | 10 | 20 | 3 hr exam,Lab report, Coursework, Online Quizzes |
| SHC4035 | Advanced Mass Transfer & Reaction Engineering | 75 |  | 25 | 3 hr exam, group report & talk, individual report |
| NHM2405 | Advanced Energy Systems | 0 |  | 100 | In class test, assignments |
| NHM2420 | Project Quality and Production Management | 0 |  | 100 | In class test, group report, assignment |

**Appendix 4 - Course Assessment Board Structure**

|  |  |  |  |
| --- | --- | --- | --- |
| **Mode of Study** | **Course Start Month** | **Length before Main CAB** | **Expected Month for Main CAB** |
| UGT FT | September | 9 months | June |

**Appendix 5 - PDP Mapping**

Demonstration of how personal development planning (PDP) maps onto modules and is progressed through the course.

\*Please use a table to demonstrate mapping as best suits the format of the PDP planning for the course via the modules.