**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 (4years)Full Time with SWE (5 years) |
| **6.** | **Final Award** | Master of Engineering MEng |
| **7.** | **Course Title** | MEng Chemical Engineering, MEng 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 MEng Chemical Engineering and MEng 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 recently developed BEng(Hons) Chemical Engineering and BEng(Hons) Chemical Engineering with Chemistry courses form~~s~~ the foundation for the MEng Chemical Engineering degree and MEng Chemical Engineering with Chemistry degree and transfer between the courses will be possible. The degrees build upon the expertise and tradition in the School of Applied Sciences and also utilises our upgraded Chemical Engineering facilities to enhance students’ learning and experience in the areas of advanced chemical engineering. Employment opportunities for chemical engineers are being created in other sectors as industry faces new challenges in the 21st century ranging from environmental stewardship through to energy usage. Particular pressure is coming through regulation with evermore demanding legislation moving away from covering pollution control and abatement to more sustainable forms of production.

The MEng courses will provide highly numerate graduates with strong and deepening chemical engineering knowledge. A sound knowledge of chemical principles, fine chemicals manufacture, pharmaceutics and formulation will give the students a strong cross-disciplinary advantage. Career progression may occur through further specialism into Chemical Engineering at postgraduate master’s level, or through direct entry into the chemical engineering, petrochemical, process development, food and related sectors.

Chemical Engineering graduates, as well as being knowledgeable about their own subject, have also been trained in other transferable skills permitting them to proceed into other careers that value highly trained numerate graduates with good problem solving skills.

*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).
7. produce students that have a critical awareness of current problems and new insights at the forefront of chemical engineering. They should be able to evaluate current research and methodologies, develop critiques, show originality in the application of knowledge and, where appropriate, propose new hypotheses.

**12. Intended Learning Outcomes**

***Knowledge and Understanding***

Students will have knowledge and understanding of:

1. the key areas in advanced chemical engineering such as advanced transport phenomena (unified momentum, heat and mass transfer) and chemical reactor design, advanced unit operation methods, advanced process control and safety.
2. the main branches of chemistry and other sciences that are relevant and additional to a professional chemical engineer (physical chemistry, synthesis, pharmaceutical and biological processing, sustainable development and environmental technology).
3. the advanced engineering mathematics and process simulation that underpin current chemical engineering technologies.
4. design methodology that is at the forefront of the discipline through design project work.
5. the most recent developments in chemical engineering and their likely applications.
6. a wide range of chemical engineering processes, simulation tools and process equipment and their commercial and industrial applications and limitations.

***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 and design choices based upon this.
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 and use it to generate designs of products, processes and systems capable of meeting new and existing needs.
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 and present new hypothesis.
6. use software for 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. Apply comprehensive and deep understanding of design processes and methodologies to unfamiliar situations.
9. employ and handle chemicals and apply standard laboratory procedures safely and demonstrate the correct use of standard instrumentation, pilot plants and unit operation facilities.
10. have a full and deepening awareness of the processes and equipment in their applicable areas and their limitations and be able to apply this awareness to design and operation.
11. investigate chemical and physical properties, events or changes by observation and measurement, and exemplify the systematic and reliable recording of results.
12. interpret experimental results in terms of their significance and underlying theory.
13. understand the legal framework in chemical engineering operation and thus be able to produce risk assessments on chemical processes, laboratory procedures and pilot plant and unit operations. This will include awareness of the health and safety, economic, ethical, social and environmental context, and the ability to make suggestions to resolve issues and dilemmas in these areas.
14. 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. numeracy and computational skills, including the use of general and specialist software.
2. verbal and written communication skills which show the ability to summarise scientific information and engineering data, interpret results, and compose, present and justify arguments.
3. 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.
4. information retrieval skills, including on-line searches and primary literature research skills.
5. study skills for continuing personal development including the ability to apply the above skills in a wide range of chemical engineering and non-chemical engineering situations.

**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 predominantly 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, honours level and masters level modules (“I”, “H” and “M” 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, 120 “H” level credits in the third year and 120 “M” level credits in the final year. Students may take an optional placement at the end of year two, which will carry 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. Essential supporting material on economics, safety, pollution control and process simulation is also covered. In addition, underpinning scientific principles are introduced in chemistry, pharmaceutics 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.

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, fine chemical production, particle handling and solid-fluid systems are covered in detail. A key focus is the chemical process industry and students will undertake practicals focusing upon key reactions in fine chemicals manufacture and pilot plant practice (operation, maintenance, reliability etc). Important aspects of professional development are brought into focus, with a clear aim to develop both chemical engineering specific and generic transferable skills. Students will examine key issues around process safety, economics, engineering codes of practice, sustainability, systems analysis and process integration. Concepts in product design and formulation will also be developed further.

**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 MEng 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 progress into the final year is possible, and 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.

 **Year 3 - Full Time - Optional**

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

Year 4 - The critical subject of reactor design builds upon earlier concepts introduced in the course. An advanced chemical engineering design project will allow the student to work independently, but with guidance, on specific problems, and will enable them to develop their own line of investigation in areas of current interest in the subject. A thorough appraisal of unit operations, process control, transport phenomena, aerodynamics and computational fluid dynamics will provide in depth high level coverage of key engineering concepts. Physical organic chemistry, mechanistic insight and advanced aspects of fine chemical route selection (including catalytic and asymmetric processes) are covered.

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.

**Year 4 - 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 |

Year 5 - This final year study includes modules of more advanced level in depth and breadth of chemical engineering and chemical engineering practice. The theory modules will allow students to broaden their knowledge of recent developments in chemical engineering and also allows for independent analysis of the current challenges that chemical engineers are facing and allows students the opportunity to work autonomously in order to devise solutions. A critical understanding of computer aided chemical product and process design offers students the opportunity to deepen their knowledge and skills in the use of advanced computer tools for chemical engineering practice in terms of product and process design and the ability to suggest and analyse options for unmet needs. A research project will enable students to develop their own line of investigation in areas of current interest on specific problems with guidance from their academic supervisors. In project work, students are able to learn at the forefront knowledge in a particular area and to generate new knowledge but will also develop skills of research such as literature review, setting up project objectives and planning and designing methodology. Group working skills will be developed. Students will develop their transferrable skills in extensive dissertation writing and oral presentation of the results to an audience of experts and non-experts. An extensive and reflective professional development portfolio will be produced.

N.B. In order to comply with the Engineering Council rules for compensation and condonement on accredited engineering programmes, major project modules (SMC4020) cannot be condoned.

**Final Year Full Time - Masters Level**

|  |  |  |  |
| --- | --- | --- | --- |
| **Level** | **Module Code/Title**  | **Credits** | **Type** |
| F (FHEQ 7) | SMC4013 Computer Aided Product and Process Design | 20 | Core |
| F (FHEQ 7) | SMC4014 Recent Advances in Chemical Engineering | 20 | Core |
| F (FHEQ 7) | SMC4003 Surfaces, Polymers and Theoretical Chemistry | 20 | Core |
| F (FHEQ 7) | SMC4020 Chemical Engineering Research Project  | 40 | Core |
| F (FHEQ 7) | SMC4022 Advanced Process Development | 20 | Core |

MEng Chemical Engineering or MEng Chemical Engineering with Chemistry can be awarded upon successful completion of modules that give the student 480 credits of which no more than 120 must be at Foundation level, no more than 120 must be at Intermediate level, no more than 120 must be at Honours level and at least 120 must be at Master’s level. To obtain an MEng Chemical Engineering or MEng Chemical Engineering with Chemistry, the student shall also normally have undertaken andpassed a project or dissertation on a suitable academic subject worth 40 M level credits together with 60 credits of other final year modules. They must also have achieved an average of at least 50% in the third year H and final year M level modules and an overall pass mark of 50%.

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/> .

Students who score less than 50% may be eligible for the award of BEng (Hons) Chemical Engineering with a classification based on the provisions in the University of Huddersfield Regulations for Awards.

Students who enter directly into the third year will be classified based on the average of the marks from the best 100 H and 100 M level credit marks with the M level credit modules having a weighting of 2, with the proviso that no more than 100 credits can be counted from any one particular academic year of study.

At Masters level a student should have a comprehensive knowledge of their subject and a critical awareness of current problems and new insights at the forefront of chemical engineering. They should be able to critically evaluate current research, evaluate methodologies, develop critiques, show originality in the application of knowledge and, where appropriate, propose new hypotheses.

**13.3** **Interim Awards**

Students who are unable or do not wish to complete the MEng programme are able to gain intermediate awards determined by the number and type of credits as follows:

|  |  |
| --- | --- |
| **Award** | **Credits** |
| Certificate of Higher Education | 120 “F” credits |
| Diploma of Higher Education  | 120 “F” credits + 120 “I” credits |
| BEng Chemical Engineering  | 120 “F” credits + 180 “I”/”H” credits (with at least 60 “H” credits) |
| BEng (Hons) Chemical Engineering | 120 “F” credits + 120 ”I” credits + 120 ”H”/”M” credits |
| BEng (Hons) Chemical Engineering with SWE | 120 “F” credits + 120 ”I” credits + 120 ”H”/”M” credits + 120 “S” 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. The final year will include a dissertation and a professional skills portfolio. Formative tests are widely used, especially in the first year. A summary of assessment is given in Appendix 3. A schedule will be given to all students at the start of the academic year.

practical work, practical based laboratory reports, problem solving assignments (including cross-curricular) and short tests, including MCQs, as well as a small number of essays, oral and poster presentations.

**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 340 points consisting of awards that equate to 100 points in maths (grade B ‘A’ level mathematics, or its equivalent) and 100 points in chemistry (grade B ‘A’ level chemistry, or its 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 70% overall and 70% in the Maths and Physics 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

Greater than 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 AAABB to include a minimum of A in Mathematics and A in Chemistry.

**16.5.5** Scottish Advanced Highers

Must achieve ABB 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 50% 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 | ✔ | ✔ | ✔ | ✔ |  | ✔ | ✔ |

**Year 4 - 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 |  | ✔ |  |  |  | ✔ | ✔ |
|  |  |  |  |  |  |  |  |

**Final Year – Masters Level**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Learning Outcome | SMC4013 | SMC4014 | SMC4003 | SMC4018 | SMC4022 |  |  |
| 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 |

**YEAR 4 – 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 |

**YEAR 5 – MASTERS LEVEL MODULES**

|  |  |  |  |
| --- | --- | --- | --- |
| **Module****Code** | **Module Title** | **Assessment Weighting** | **Assessment Strategy** |
| **Exam** | **C/W** |
| **practical** | **other** |
| SMC4013 | Computer Aided Product and Process Design |  |  | 100 | Design project, in-class test, coursework |
| SMC4014  | Recent Advances in Chemical Engineering |  |  | 100 | Coursework |
| SMC4003 | Surfaces, Polymers and Theoretical Chemistry |  |  | 100 | In-class test, continual assessment |
| SMC4018  | Research Project |  | 100 | Coursework, Project |
| SMC4022  | Advanced Process Development | 75 |  | 25 | 3 hour exam, Coursework |

**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.