# University of Huddersfield

# Programme Specification

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| 1 | Awarding Institution | University of Huddersfield |
| 2 | **Teaching Institution**  | University of Huddersfield |
| 3 | **School and Department** | School of Computing and EngineeringDepartment of Engineering and Technology |
| 4 | **Programme accredited by** | The Institute of Engineering and Technology (IET) |
| 5 | Mode of delivery | Full-time & Sandwich  |
| 6 | Final Award | BEng (Hons) Computer Systems Engineering (BEng/CSE) |
| 7 | Programme title | BEng Computer Systems Engineering Programme |
| 8 | UCAS code | H6G4 BEng/CSE |
| 9 | **Subject benchmark statement** | Engineering (2019) |
| 10 | Date of Programme Specification | July 2011, April 2013, July 2013, February 2014, June 2014,March 2016, January 2017, October 2018, February 2019,June 2020, June 2021, November 2021, February 2023 |

**11 Educational aims of the Programme**

The BEng Computer Systems Engineering course has been designed to integrate electronic engineering based modules, from the MEng/BEng Electronics courses, with computer based modules. The course incorporates long established electronics based modules, which provide the breadth of coverage and depth of treatment necessary to satisfy the requirements of the Institution of Engineering and Technology (IET) along with modules with a more in-depth focus on computing.

The course has been designed to stimulate interest from a broad spectrum of prospective students from a variety of educational backgrounds.

The broad aims of the programme are:

1. To prepare graduates for employment as professional engineers working in the field of computer systems and electronic engineering.
2. To develop graduates to BEng(Hons) level in the discipline of computer systems and electronic engineering according to the requirements set out in the United Kingdom Standard for Professional Engineering Competence (UK-SPEC), the Engineering Subject Benchmark and the QAA framework.

###### 12 Intended learning outcomes

The primary aim of this course is to prepare graduates for employment as professional engineers working in the field of computer systems and electronic engineering. The Engineering Council’s: United Kingdom Standard for Professional Engineering Competence (UK-SPEC), which has also been adopted as the Engineering Benchmark Statement, specifies the engineering-generic learning outcomes expected for engineering courses leading to Incorporated Engineer (IEng) status. Since a number of modules on this course were developed for the courses within the Chartered Engineer (CEng) accredited MEng/BEng Electronic Programme, it is sensible to adopt a combination of the UK-SPEC CEng outcomes, with limited re-phrasing to provide subject emphasis; to specify the learning outcomes expected of the course.

The presentation of course learning outcomes in the University of Huddersfield programme specification documents is required to conform to the University’s standard. So the more limited number of outcomes have been ordered accordingly, but developed to encompass all the main aspects of UK-SPEC (AHEP 3) outcomes. have more than one operative verb, and so have been split: this is indicated by a letter following the UK-SPEC code.

A matrix showing the course outcomes addressed by each module is presented in Appendix A.

The Engineering Council’s: United Kingdom Standard for Professional Engineering Competence (UK-SPEC), which has also been adopted as the Engineering Benchmark Statement, specifies the engineering-generic learning outcomes expected for engineering courses leading to Chartered Engineer (CEng) status. Consequently, the UK-SPEC (AHEP 3) outcomes have been supplied in Appendix D. The matrix, also in Appendix D, shows how each of the modules contributes to satisfying the specific learning outcomes and thus the requirements of the Engineering Council, IET and HEFCE.

The learning outcomes for these courses have been developed in light of the Quality Assurance Agency for Higher Education subject benchmark statements and the National Qualifications Framework (NQF). They are expressed in terms of the students’ abilities at the end of Foundation (F), Intermediate (I), Honours (H).

The phrase ‘electronic and computing specialism’ is used within a number of outcomes and is intended to signify that these outcomes relate to the engineering disciplines covered within the associated course. The specific area of focus covered by a module, is indicated by one or more of the following letters ‘a - c’ following the course learning outcome code where;

a: Electronics b: Computing, c: general engineering areas, as is detailed in Appendix A: Mapping of Course Outcomes to Modules.

This BEng course provide opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

**Knowledge and Understanding**

|  |  |
| --- | --- |
| KU1 | Demonstrate a sound knowledge of the mathematical principles which underpin electronic engineering and computing specialism. (F) |
| KU2 | Demonstrate a sound knowledge of the basic concepts of electronic engineering and computing specialism. (F) |
| KU3 | Demonstrate a sound understanding of the mathematical and engineering principles within electronic engineering and computing specialism, and an ability to apply those principles more widely. (I) |
| KU4 | Demonstrate an in-depth knowledge of innovations and developments in electronic engineering and computing specialism (H) |
| KU5 | Demonstrate an understanding of appropriate codes of practice, quality issues, professional and ethical conduct. (F, I, H)  |
| KU6 | Demonstrate an in-depth knowledge of the engineering specialism and associated innovations. (H) |
| KU7 | Demonstrate a thorough understanding of commercial and economic considerations. (I, H) |

**Skills and other Attributes**

|  |  |
| --- | --- |
| SA1 | Apply fundamental mathematical methods and engineering principles in the analysis of electronics and computing engineering problems. (F) |
| SA2 | Apply extensive mathematical methods and engineering principles to analyse complex electronic and computing engineering problems. (I, H) |
| SA3 | Use creativity to develop innovative engineering design solutions. (H) |
| SA4 | Investigate and define electronics and allied engineering problems, identifying environmental and sustainability limitations, health and safety and risk assessment issues. (F, I, H) |
| SA5 | Working with technical uncertainty (H) |
| SA6 | Identify the performance of electronic and computing systems using analytical and computer software techniques. (F, I) |
| SA7 | Critically identify and classify the performance of electronic and computing systems using analytical and computer software techniques and assess the limitations. (H) |

**Professional Practical Skills**

|  |  |
| --- | --- |
| PS1 | Workshop, Laboratory and or specialist computer software application skills. (F, I, H) |
| PS2 | Be able to access, prepare, process and present information using information technology and standard software packages. (F, I, H) |
| PS3 | Evaluate the appropriateness of different sources of technical literature (datasheets, journal publications etc) and different approaches to solving problems. (I, H) |

**Transferable Skills**

|  |  |
| --- | --- |
| TS1 | Communicate effectively, both orally and in writing. (F, I, H)  |
| TS2 | Work effectively to given objectives and deadlines. (F, I, H) |
| TS3 | Take responsibility for, and reflect upon, one’s own learning abilities and personal development. (F, I, H) |
| TS4 | Have the ability to work effectively in a team environment. (F, I) |

###### 13 Programme structures and requirements, levels, modules, credits and awards:

**13.1 Awards of the Programme**

**BEng (Hons)** (full-time) requires successful completion of modules worth 360 credits: normally 120 at H level, 120 at I level and 120 at F level; although higher level credits may be substituted at I or F levels.

**BEng** (full-time) requires successful completion of modules worth 300 credits: normally 60 at H level, 120 at I level and 120 at F level; although higher level credits may be substituted at I or F levels.

**Sandwich awards** may be made on completion of the Industrial Placement module, worth 120 sandwich credits. Industrial placement normally takes place in the third year of the course

**DipHE in Electronic Engineering** for which the minimum requirement is 240 credits of which at least 120 must be I and/or H level.

**CertHE in Electronic Engineering** for which the minimum requirement is 120 credits F level.

**13.2 BEng(Hons) Course Structure**

The structure for the CSE course is presented below. The Professional Development, Mathematics and Electronics 1 in year 1 are common with the BEng Electronic based CEng accredited courses. Software Design & Development and Computer Organisation & Architecture are computing specific modules. Year 2 has three modules in common with the BEng Electronics courses and a further three computing specific modules: Relational Databases & Web Integration, Algorithms & Data Structures and Operating Systems. Year 4 consists of the Individual Project module, which will relate to the specialism of the course title, and four technical course-specific modules.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Module** **Code** | **Module Name** | **Level** | **Credits** | **Term** | **Type** |
| **CFS2101** | Computer Organisation and Architecture | F (FHEQ 4) | 20 | Term 1 | Core |
| **NFE2105** | Mathematics | F (FHEQ 4) | 20 | Term 1 | Core |
| **NFE2156** | Professional Development | F (FHEQ 4) | 20 | Term 1 | Core |
| **NFE2159** | Electronics 1 | F (FHEQ 4) | 20 | Term 2 | Core |
| **CFS2160** | Software Design and Development | F (FHEQ 4) | 40 | Yearlong | Core |
| **CIS2206** | Algorithms and Data Structures | I (FHEQ 5) | 20 | Term 1 | Core |
| **CIS2360** | Relational Databases and Web Integration | I (FHEQ 5) | 20 | Term 1 | Core |
| **NIE2208** | Enterprise: Electronic Product Design and Manufacture | I (FHEQ 5) | 20 | Term 1 | Core |
| **CIS2208** | Operating Systems | I (FHEQ 5) | 20 | Term 2 | Core |
| **NIE2203** | Electronics 2 | I (FHEQ 5) | 20 | Term 2 | Core |
| **NIE2206** | Embedded Systems | I (FHEQ 5) | 20 | Term 2 | Core |
| **NSZ2303** | Industrial Placement | S | 120 | Yearlong | Optional\* |
| **NHM2420** | Project Quality and Production Management | H (FHEQ 6) | 20 | Term 1 | Core |
| **CHI2400** | Information Architecture | H (FHEQ 6) | 20 | Term 1 | Option-A\* |
| **NHE2404** | DSP Applications | H (FHEQ 6) | 20 | Term 1 | Option-A\* |
| **NHE2483** | Digital System Integration | H (FHEQ 6) | 20 | Term 2 | Core |
| **NHE2530** | Parallel Computer Architecture Clusters and Grids | H (FHEQ 6) | 20 | Term 2 | Core |
| **NHP2400** | Final Year Project | H (FHEQ 6) | 40 | Yearlong | Core |

\*Students take 1 from OPTION-A. Sandwich Year (Level S) is optional.

The course structure develops three primary technical themes;

* Computer-based systems: Software Design & Development and Computer Organisation & Architecture in year 1; through Embedded Systems and Operating Systems in year 2 to DSP Applications and Parallel Computer Architectures, Clusters & Grids in year 4.
* Computer software: developed through Writing Software in year 1; Embedded Systems, Algorithms & Data Structures and Relational Databases & Web Integration in year 2; Project, Quality & Production Management in year 4.
* Electronics: runs through years 1-4 with Electronics 1, Electronics 2 and the year 4 module Digital System Integration.

Underpinning Science and Mathematics (C1):

Underpinning scientific principles are developed at year 1 in Computer Organisation & Architecture, Software Design & Development, and to a lesser extent by support material within Electronics 1. In year 2 they are extended through Operating Systems, Algorithms & Data Structures, and to a lesser extent by support material within the remaining technical modules. Underpinning mathematics is developed at year 1 in Mathematics. Further development is then embedded within technical modules in years 1, 2 and 4 such that mathematics is learned and applied within an engineering/computing context.

Engineering Analysis (C2-C4):

Methods of engineering analysis are taught and applied within all the technical modules of the programme. Analysis is undertaken within teaching to support understanding and conception, to derive design equations, and to develop analytical capability in support of problem solving. Computer packages are widely used in support of this process, and students receive instruction on the use of these packages.

#### Design and Innovation (C5-C6):

#### The design outcomes C5-C6 relate to design in its broadest sense: problem investigation and definition, including customer/user needs, costs, environmental, sustainability, H&S, production, maintenance and disposal aspects, and the application of creativity and innovation. The majority of the technical modules in the programme would naturally be expected to address design: and they do. But it is not practical in all these modules to seek to address design in this broad sense. The approach adopted within the course is thus to provide a core of modules which address design in the broad sense of C5-C6: Software Design & Development at year 1, Enterprise: Electronic Product Design and Manufacture at year 2, and the Individual Project at year 4. The remaining technical modules then develop technical design knowledge - probably most closely associated with engineering/computer analysis outcome C3, the application of quantitative methods and computer software in order to solve engineering problems – which are assessed by coursework which in most cases addresses the design outcomes C5-C6.

The Engineer and Society (C7-C11):

Knowledge and understanding of economic, social and environmental issues is developed primarily in the year 1 Professional Development and year 2 Enterprise: Electronic Product Design and Manufacture modules. The latter is based on electronic product design and manufacturing group project work, in the context of business, environment, finance, marketing, engineering management and design for manufacture; it is designed as an integrative module involving problem based learning. Assignments in other modules and the Individual Project module contribute further to these issues. Also, but this is optional, students undertaking a placement in year 3 are required to gain an understanding of company organisation and practices.

Engineering Practice (C12-C18):

Workshop and laboratory skills are developed principally through laboratory work in technical modules, throughout the course, in a range of technical contexts. Similarly, understanding the use of technical literature, from technical specifications through to journal papers is addressed throughout the course within laboratory, technical assignments and project work. Quality, contexts for application of engineering practice, codes of practice and legal issues are addressed primarily in the Professional Development (year 1), Enterprise: Electronic Product Design and Manufacture (year 2) and Project, Quality, & Production Management (year 4) modules, also elements of these are addressed in a range of other modules throughout the course.

**13.4 Key Skills Themes**

The mathematics and engineering principles required to underpin these technical themes are developed through the Analytical Skills & Mathematics for Technology and Algorithms & Data Structures modules. Broadening and contextual development are addressed through the year 1 Professional Development and year 2 Enterprise: Product Design and Manufacture modules. The modules within the technical themes develop these areas further, as discussed below in relation to UKSPEC.

Transferable skills development in communication, study and group work is addressed principally within the year 1 Professional Development and the year 2 Enterprise: Electronic Product Design and Manufacture modules. CV preparation and career planning are developed within the Professional Development module and also through the Industrial Placement preparation sessions in Year 2, which also develop students’ interview and presentation skills. Personal Development Planning is encouraged and monitored through the personal tutor system as explained in section 15.

The year 4 Individual Project provides the opportunity for students to apply the knowledge and skills that they have developed within the course to the solution of a significant engineering problem within their area of specialism. This integrative project provides the most significant assessment of a student’s overall achievement, and this is reflected in its contribution to the final award classification.

The Programme provides the opportunity for students to undertake an assessed, 48-week industrial placement. This allows students to gain a detailed understanding of an industrial environment, to become involved in the processes of industry whilst undertaking a role which allows them to apply the knowledge and skills that they have developed within their course, and in the process to develop technical, personal and interpersonal skills that will help to prepare them for future employment. The placement year is not compulsory, but it is strongly recommended.

###### 14 Teaching, Learning and Assessment

Teaching and learning enables students to acquire the knowledge and skills required by the programme. A variety of strategies are used depending on the nature of the material being considered and also taking into account the individual learning styles of the students. Whatever the learning strategy adopted in a particular module, and the timetabled contact hours, it is expected that a 20 credit module will occupy a student for at least 200 hours.

Typically, both formal and informal lectures are used as a mechanism to provide key facts, concepts, theories and methodologies. These may be backed up by tutorial and/or practical sessions. These sessions allow students to develop their skills in the areas being considered, to receive immediate feedback on their progress and to take charge of their own learning.

In some subject areas, the key facts are less well-structured and therefore dissemination through lectures is not the most appropriate teaching method. These subjects will typically be taught using studio-based sessions or small group seminars. In these sessions the learning is very much student centred with the lecturer providing direction towards a variety of learning and data resources. Subjects falling into this category include several of the design modules and the enterprise element at second year.

Use of IT resources in teaching is made across the full range of subjects. This may be in the form of online learning material, chat rooms and interactive demonstrations and examples. This type of learning environment allows students to take greater control of their own learning and allows study to take place according to the student’s own schedule. However, this type of learning is provided in addition to timetabled sessions where attendance is compulsory. Students are introduced to the University and Departmental systems for C&IT in the Professional Development module and in several technical modules at year 1.

Formative assessment is seen as an important part of the learning process and may be provided in a variety of ways. Whenever possible, students will be given individual feedback on their progress prior to formal assessment. This feedback may be in the form of verbal comments on work reviewed in a tutorial, seminar or studio session or written feedback on a piece of work submitted prior to assessment. It is important to understand that formative assessment is a student driven process. Students are not required to submit work for formative assessment but must do so if they desire this feedback.

Assessment is used to determine if students have achieved the learning outcomes of individual modules and hence, the learning outcomes of the programme. A number of forms of assessment are used. These can include formal reports and log books on assignments and laboratory work, audio-visual presentations (both individually and as a member of a group), computer based tests, short tests and formal examinations. In all cases, assessment takes place under the regulations set down in the Regulations for Awards and repeated in the Students’ Handbook of Regulations.

The assessment to be used in individual modules is indicated in appendix C.

###### 15 Support for students and their learning

**University Level**

A range of central facilities are provided to support students:

* Student Services, which provides specialist advice in the areas of counselling, disability, pastoral care and chaplaincy, accommodation, finance and careers; it also supports a day-care nursery and job shop for part-time work.
* The Learning Centre (library and computing facilities), which provides induction and ongoing support for students.
* The International Office, which provides help and support for overseas students.

**Programme Level**

* All students undertake an induction programme at year 1.
* All students have a personal tutor, with whom they can discuss personal and academic difficulties. The Personal Tutor will refer tutees to central help facilities as appropriate.
* Year tutors are available to provide guidance on academic progress.
* Module tutors are available to help with academic problems both inside and outside timetabled hours.
* An Academic Skills Tutor is available at school level to provide assistance with study and other skills.
* A central computer-based attendance monitoring scheme is operated and students with poor attendance are contacted and advised.
* Supporting documentation is provided, either online or printed in the form of student handbooks, module handbooks, programme specifications and module specifications.
* All modules and year groups are supported on the virtual-learning environment, Unilearn (Blackboard),.

**Personal Development Planning (PDP)**

* All students are introduced to and encouraged to undertake PDP.
* Personal Tutors will meet their students at least five times: twice in term 1, twice in term 2 and once in term 3.
* Students are required to complete a self evaluation PDP form, available electronically on Unilearn (Blackboard), which enables them to assess their own personal/social competences and module performance. This information is then used as a basis for further discussions during personal tutor sessions.
* Personal tutors are the Year Tutors for Years 1 and 2, and the Project Supervisor for Year 4
* PDP is further covered in the following modules throughout the course;
* Year 1: Professional Development (learning logs etc).
* Year 2: Enterprise: Electronic Product Design & Manufacture
* Year 4: Individual Project
* Year 5: Group Project

A brief outline of the main personal and professional competences and areas where addressed are listed in the tables below;

|  |  |  |  |
| --- | --- | --- | --- |
| Competencies | Course Year | Areas where addressed | Evidence |
| PersonalCommunication Skills | Year 1 | * NFE2156 Professional Development module
* Personal Tutor (PT) PDP process
 | * Sample Formal Report from a technical module.
* PowerPoint presentation and grade for NFE2156.
* Completed PDP proforma from PT PDP process
 |
| Time Management andSelf OrganisationIndependent Learner | Year 2 | * NIE2208 Enterprise: Electronic Product Design & Manufacture module
* Personal Tutor PDP process
 | * Enterprise group presentation. Sample Assignment report
* Completed PDP proforma from PT PDP process
 |
| Self awareness/Reflective Practice | Year 4 | * Personal Tutor PDP process
 | * Project report and poster.
* Completed PDP proforma from PT PDP process
 |
| Group Working | Year 5 | * Group Project module.
* Personal Tutor PDP process
 | * Project report and presentations.
* Completed PDP proforma from PT PDP process
 |
|  | Year 1 | * Year group sessions with careers guidance officer in NFE2156 Professional Development module
 | * CV
* Personal research into professional competencies required for chosen career area.
* Completed PDP proforma from PT PDP process.
 |
| Career Planning | Year 2 | * 1hr/wk timetabled sessions with Industrial Training/Careers guidance officer.
 | * CV, feedback from mock interviews.
 |
|  | Year 4 | * Group session with careers guidance officer.
* Personal session with careers guidance officer - recommended
 | * Personal research into professional competencies required for chosen career area.
* Completed PDP proforma from PT PDP process.
 |
|  | Year 5 | * Personal session with careers guidance officer - recommended
 | * Personal research into professional competencies required for chosen career area.
* Completed PDP proforma from PT PDP process.
 |

|  |  |  |  |
| --- | --- | --- | --- |
| Competencies | Course Year | Areas where addressed | Evidence |
| ProfessionalIT Skills (IT) | Year 1 | * IT, AS, PS1/2 : addressed to varied degrees across all modules.
* Personal Tutor PDP process
 | * Formal reports, grades and feedback.
* Laboratory log books grades and feedback.
 |
| Analytical Skills (AS) | Year 2 |
| Problem Solving (PS1) | Year 4 |
| Practical Skills(PS2) | Year 5 |
| Technical Knowledge | Year 1 | Further competence areas relating to technical or management knowledge and skills are selected by the student as part of the PDP process. It would be expected that these would be themes running through the years, e.g knowledge and skills in software development and embedded systems; knowledge and skills in technical management etc. | * Formal reports, grades and feedback.
* Laboratory log books grades and feedback.
* Examination results
 |
| Managerial | Year 2 | * Formal reports, grades and feedback.
* Laboratory log books grades and feedback.
* Examination results
 |
|  | Year 4 | * Draft project report, and feedback.
* Project grade.
* Formal reports, grades and feedback.
* Laboratory log books grades and feedback.
* Examination results
 |
|  | Year 5 | * Group project report, and feedback.
* Formal reports, grades and feedback.
* Examination results
 |

###### 16 Criteria for Admission

The recruitment and admissions process endeavours to ensure a good match between the abilities and aptitudes of the applicants and the demands of the programme. The aim is to facilitate widening participation whilst ensuring that students can reasonably expect to succeed on their chosen course.

Course entry requirements are as given on the University web site: <http://www.hud.ac.uk/courses>

###### 17 Methods for evaluating and improving the quality and standards of teaching and learning

**Quality and Standards**

* The University’s Teaching and Learning Committee has ultimate responsibility for quality and standards of teaching and learning in the University.
* The School Board, via the School Teaching and Learning Committee has responsibility for implementing university policy through school-defined procedures.
* Periodic subject reviews take place on a rolling quinquennial programme and focus inter alia on the arrangements for quality management and enhancement, teaching, learning and assessment, C&IT strategies, the articulation and assurances of standards, external examiner reports and evaluation and links with professional bodies, employers and other external organisations.

**Monitoring, Development and Evaluation**

* The Course Committee is responsible for the monitoring and development of the course or programme, taking account of feedback from staff, students and external examiners. Feedback is sought as follows:
* from students through annual course and module evaluation questionnaires, termly student panel

 meetings and input from student members of the Course Committee;

* from external examiners through annual reports, course assessment board minutes, assessment

moderation reports and informal verbal communication during the year.

* The annual evaluation of the course/programme is the responsibility of the School Board. The Course Committee prepares an annual evaluation report comprising reporting and evaluation, informed by feedback from staff, students and external examiners and by statistical data.

**Validation of Courses, Modules and Changes**

* Course validation takes place under the University's Quality Assurance Procedures for Taught Programmes.
* Amendments to course/programme and module documents are validated by the School Accreditation and Validation Panel.

**Teaching and Learning**

* The School Teaching and Learning Panel, a sub-committee of the School Teaching and Learning Committee, is tasked with implementing the University's teaching and learning strategy and with fostering innovation in teaching and learning and the dissemination of good practice.
* A process for the peer observation of teaching is in place with the object of enhancing teaching practice and sharing ideas between staff.

###### 18 Regulation of assessment

The assessment regulations are as detailed in the University of Huddersfield Regulations for Awards, relevant sections of which are repeated in the Students' Handbook of Regulations. These regulations are not repeated here, since the University periodically changes its regulations.

Details of the assessment schedule and outcomes assessed for each module are provided in the module specification documents, which are available on the School's web site.

**Course Specific Regulations**

All courses are accredited by the professional body, The Institute of Engineering and Technology (IET), as meeting relevant academic requirements for Chartered Engineer status. As a condition of accreditation, the following regulation, in addition to that currently found in the University of Huddersfield Regulations for Awards, must also be satisfied:

* Where a module comprises two or more modes of assessment, all assessment components of weighting greater than 30%, are required to gain a minimum grade of no more than 10% below the pass mark.
	+ For F-Level, I-Level and H-Level modules the threshold will be 30%.
	+ For M-Level modules the threshold will be 40%.

The following course regulation, which is a requirement of Professional body accreditation, will be applicable for student entry from academic year 2022-2023.

* A maximum of 20 credits in a Bachelor’s or Integrated Master’s degree can be condoned (termed Compensation by the Engineering Council).
	+ If a module is available for Condonement, an opportunity will be given to undertake the appropriate referral assessment/s – if however the respective module is not subsequently assessed as an overall pass, then the condoned pass credits will be awarded, with no further module condonement available in subsequent levels of the course.

###### 19 Indicators of quality and standards

**Course Validation.**

Original University Validation, July 2008

This course initially received Incorporated Engineer (IEng) accreditation by the professional body the Institute of Engineering and Technology (IET) in 2012, However at the most recent reaccreditation, in March 2021, the accreditation level was confirmed as Partial Chartered Engineer (CEng) status.

The course is currently – ‘Partial CEng Accreditation Accredited by the Institution of Engineering and Technology on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as an Incorporated Engineer and partly meeting the academic requirement for registration as a Chartered Engineer.’

The next accreditation event is scheduled for 2026.

Please note: This specification provides a concise summary of the main features of the Programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the study module guide and course handbook. The accuracy of the information contained in this document is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

**Key sources of information about the course can be found in:**

[www.hud.ac.uk](http://www.hud.ac.uk) - University website

http://compeng.hud.ac.uk/external/course-finder/subject-eleceng.php

 - Contains information about the courses and facilities at the

 University of Huddersfield

http://compeng.hud.ac.uk/internal-student/documents/index.php - The School of Computing and Engineering intranet contains Year Handbooks and Module Specifications.

**APPENDIX A: MAPPING OF COURSE OUTCOMES TO MODULES**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Modules****Learning Outcomes** | **CFS2101** | **CFS2160** | **NFE2105** | **NFE2156** | **NFE2159** | **CIS2360** | **CIS2208** | **CIS2206** | **NIE2203** | **NIE2206** | **NIE2208** | **NHP2400** | **NHE2483** | **NHM2420** | **NHE2530** | **CHI2400 O** | **NHE2404O** |  |
| KU1 |  b |  |  c |  |  a |  |  |  |
| KU2 |  b |  b |  |  |  a |  |
| KU3 |  |  | b | b |  a |  c |  |  |
| KU4 |  |  c |  a |  | b |  | c |  |
| KU5 |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| KU6 |  |  |  c |  a |  | b |  | c |  |
| KU7 |  |   |  |  |  |  |  |  |  |  |  |  |  |
| SA1 |  b |  |  |  |  a |  |  |  |
| SA2 |  | c | a |  | b |  | c |  |
| SA3 |  |  |  |  |  |  |  |
| SA4 |   |  |  |  |  |  |  |  |  |  |  c | c |  | c | b |  |  |  |
| SA5 |  |  |  |  |  |  |  |  |  |
| SA6 |  b |  b |  c |  |  a |  |  |
| SA7 |  |  | a |  | b | a | c |  |
| PS1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PS2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PS3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TS1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TS2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TS3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TS4 |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Appendix B: Assessment Schedule**

Outline assessment schedule showing the nature and timing of summative assessments for all modules contributing to the course, including optional modules and identifying the very last submission point for the whole course:

| **Module Code** | **Assessment Task** | **Week number** | **Last Submission of course ()** |
| --- | --- | --- | --- |
| **CFS2101** | 1. In-Class Test (50%) | Week 12 or Term |  |
| **CFS2101** | 2. Practical Skills Assessment (50%) |  |  |
| **NFE2105** | 1. SAIL (24%) | Weeks 1-11 inclusive |  |
| **NFE2105** | 2. In-Class Test (38%) | Week 6 |  |
| **NFE2105** | 3. In-Class Test (38%) | Week 12 |  |
| **NFE2156** | 1. SAIL (24%) | Weeks 1-11 inclusive |  |
| **NFE2156** | 2. EnABLE (26%) |  |  |
| **NFE2156** | 3. Written Assignment (50%) | Week 12 |  |
| **NFE2159** | 1. SAIL (24%) | Weeks 1-11 inclusive |  |
| **NFE2159** | 2. EnABLE (26%) |  |  |
| **NFE2159** | 3. In-Class Test (50%) |  Week 12 |  |
| **CFS2160** | 1. Written Assignment (40%) |  |  |
| **CFS2160** | 2. Portfolio (60%) |  |  |
| **CIS2206** | 1. In-Class Test (40%) | Week 12 |  |
| **CIS2206** | 2. Portfolio (60%) |  |  |
| **CIS2360** | 1. Written Assignment (30%) |  |  |
| **CIS2360** | 2. In-Class Test (20%) | Week 12 |  |
| **CIS2360** | 3. Written Assignment (50%) |  |  |
| **NIE2208** | 1. SAIL (24%) | Weks 1-11 inclusive |  |
| **NIE2208** | 2. Portfolio (56%) |  |  |
| **NIE2208** | 3. Project Work (20%) | Week 12 |  |
| **CIS2208** | 1. Portfolio (100%) |  |  |
| **NIE2203** | 1.SAIL (24%) | Weeks 1-11 inclusive |  |
| **NIE2203** | 2. Written Assignment (26%) |  |  |
| **NIE2203** | 3. In-Class Test (50%) | Week 12 |  |
| **NIE2206** | 1. SAIL (24%) | Weeks 1-11 inclusive |  |
| **NIE2206** | 2. In-Class Test (26%) | Week 12 |  |
| **NIE2206** | 3. Written Assignment (24%) |  |  |
| **NIE2206** | 4. Project Work (26%) | Week 12 |  |
| **NSZ2303** | 1. Portfolio (100%) |  |  |
| **NHM2420** | 1. SAIL (24%) | Weeks 1-11 inclusive |  |
| **NHM2420** | 2. Project Work (33%) |  |  |
| **NHM2420** | 3. In-Class Test (43%) | Week 12 |  |
| **CHI2400** | 1. Written Assignment (70%) |  |  |
| **CHI2400** | 2. Written Assignment (30%) |  |  |
| **NHE2404** | 1. SAIL (24%) | Weeks 1-11 inclusive |  |
| **NHE2404** | 2. Written Assignment (26%) |  |  |
| **NHE2404** | 3. In-Class Test (50%) | Week 12 |  |
| **NHE2483** | 1. SAIL (24%) | Weeks 1-11 inclusive |  |
| **NHE2483** | 2. Written Assignment (26%) |  |  |
| **NHE2483** | 3. In-Class Test (50%) | Week 12 |  |
| **NHE2530** | 1. SAIL (24%) | Weeks 1-11 inclusive |  |
| **NHE2530** | 2. Written Assignment (26%) |  |  |
| **NHE2530** | 3. In-Class Test (50%) | Week 12 |  |
| **NHP2400** | 1. Written Assignment (10%) | Week 5 |  |
| **NHP2400** | 2. Written Assignment (20%) | Week 13 |  |
| **NHP2400** | 3. Oral Assessment (20%) | Week 23 |  |
| **NHP2400** | 4. Written Assignment (50%) | Week 24 | **** |

**Appendix C Mapping of UKSPEC (AHEP4) Learning Outcomes (LO) - *Partial CEng (BEng)***

The learning outcomes statements, listed are a direct copy of those contained in the Fourth Edition of Accreditation of Higher Education Programmes (AHEP4) produced by the Engineering Council - the short codes against each of the statements have been added by the IET.

 The codes have been allocated to learning outcomes as follows for Partial CEng;

 C1 Science and Mathematics

 C2, C3, C4 Engineering Analysis

 C5, C6 Design and Innovation

 C7, C8, C9, C10, C11 The Engineer and Society

 C12, C13, C14, C5, C16, C17, C18 Engineering Practice

|  |
| --- |
| C1. Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study |
| C2. Analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles |
| C3. Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed |
| C4. Select and evaluate technical literature and other sources of information to address complex problems |
| C5. Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards |
| C6. Apply an integrated or systems approach to the solution of complex problems |
| C7. Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts |
| C8. Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct |
| C9. Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity |
| C10. Adopt a holistic and proportionate approach to the mitigation of security risks |
| C11. Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion |
| C12. Use practical laboratory and workshop skills to investigate complex problems |
| C13. Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations |
| C14. Discuss the role of quality management systems and continuous improvement in the context of complex problems |
| C15. Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights |
| C16. Function effectively as an individual, and as a member or leader of a team |
| C17. Communicate effectively on complex engineering matters with technical and non-technical audiences |
| C18. Plan and record self-learning and development as the foundation for lifelong learning/CPD |