Programme Specification

Business and Technology

Bachelor in Engineering with pathways (Hons)

2018

Programme specification

(Notes on how to complete this template are provide in Annexe 2)

1. Overview/ factual information

Programme/award title(s)	B. Eng. (Hons) Engineering (Automotive) B. Eng. (Hons) Engineering (Mechanical) B. Eng. (Hons) Engineering (Electrical) B. Eng. (Hons) Engineering (Electronics) B. Eng. (Hons) Engineering (Manufacturing) B.Eng in Engineering
Teaching Institution	Havering College of Further and Higher Education
Awarding Institution	The Open University (OU)
Date of first OU validation	May 2008
Date of latest OU (re)validation	March 2013
Next revalidation	March 2018
Credit points for the award	120 credits at Level 6 for B.Eng. (Hons) Engineering with pathways 60 credits at level 6 for B.Eng in Engineering
UCAS Code	H101
Programme start date	September 2018
Underpinning QAA subject benchmark(s)	Engineering 2015
Other external and internal reference points used to inform programme outcomes	Engineering Council: *UK Standard for Professional Engineering Competence* (UK-SPEC): *The Accreditation of Higher Education Programmes* (2014)
Professional/statutory recognition	None
Mode(s) of Study (PT, FT, DL, Mix of DL & Face-to-Face)	2 years part-time Face-to-face
Duration of the programme for each mode of study	2 years part-time study.
Dual accreditation (if applicable)	None
Date of production/revision of this specification	March 2018

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 s/he 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 student module guide(s) and the students handbook. The accuracy of the information contained in this document is reviewed by the University and may be verified by the

Quality Assurance Agency for Higher Education.

2.1 Educational aims and objectives

The educational aims and objectives are to prepare students for an industrial career in which they will be able to rise to challenging problems and come up with original solutions and innovate. This should firstly be seen as a way of life with many opportunities for creative activities rather than just a job, secondly as a way to make an effective contribution to society and finally as a self-fulfilment.

Our engineering programmes are designed to meet the needs of local industry with regard to skills and competences.

We deliver engineering programmes that embed the underpinning knowledge and the skills, personal attributes that offer market value and knowledge about how organisations work and how people in them do their jobs. During the course of their study, students are able to develop a range of skills, including communication skills both oral and written, good interpersonal skills, teamwork, problem solving skills and critical thinking skills.

Students will study a selection from the following subjects dependent on their pathway: engineering materials and design, powertrain performance, economy, control system design and emissions compliance, electrified powertrain engineering, hardware and software integration, understanding customer requirements, digital innovation, CAD, CAE and Matlab simulation, vehicle electrical and hybrid engineering, hardware and software integration, testing, measurement, evaluation and verification, manufacturing technology and processes, team-building, people-management and presentation skills, body engineering, chassis engineering, quality management, vehicle engineering, electrification, autonomous vehicles and connectivity (networking), strategic planning and business analysis, project design, implementation and evaluation.

Students will be fully prepared for a challenging and rewarding career in engineering. This will enable them to make sound contributions in the following subject specialisms: Electrical, Electronic, Mechanical, Automotive and Manufacturing Engineering.

The learning outcomes were developed to align with the Engineering Council, UK-SPEC (2014) and QAA Subject Benchmark Statement for engineering (Feb 2015). Quality Assurance Agency Subject Benchmark Statement for Engineering gives the characteristics of engineering graduates which are embedded in our programme:

• be pragmatic, taking a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality;
• seek to achieve sustainable solutions to problems and have strategies for being creative, innovative and overcoming difficulties by employing their skills, knowledge and understanding in a flexible manner;
• be skilled at solving problems by applying their numerical, computational, analytical and technical skills, using appropriate tools;
• be risk, cost and value-conscious, and aware of their ethical, social, cultural, environmental, health and safety, and wider professional responsibilities;
• be familiar with the nature of business and enterprise in the creation of economic and social value;
• appreciate the global dimensions of engineering, commerce and communication;
• be able to formulate and operate within appropriate codes of conduct, when faced with an ethical issue;
• be professional in their outlook, be capable of team working, be effective communicators, and be able to exercise responsibility and sound management approaches.

It also aims to meet the specific requirements of UK-SPEC for Bachelor's (Honours)

Degree programmes intended to lead to I.Eng/ C.Eng registration. In their design in terms of programme learning aims and assessment strategy, the level 6 programme defined in this document has been developed to conform to the level descriptors for Bachelor's Degrees in UK-SPEC AHEP.

The level 6 B.Eng. (Hons) Engineering with pathways programme aims to provide a seamless progression from relevant level 5 engineering programmes offered by the college.

2.2 Relationship to other programmes and awards (Where the award is part of a hierarchy of awards/programmes, this section describes the articulation between them, opportunities for progression upon completion of the programme, and arrangements for bridging modules or induction)
The B.Eng. (Hons) Engineering with pathways leads on from level 5 engineering programmes offered at Havering College.

2.3 For Foundation Degrees, please list where the 60 credit work-related learning takes place
N/A

2.4 List of all exit awards
B. Eng. (Hons) Engineering (Automotive) B. Eng. (Hons) Engineering (Mechanical) B. Eng. (Hons) Engineering (Electrical) B. Eng. (Hons) Engineering (Electronics) B. Eng. (Hons) Engineering (Manufacturing) B.Eng in Engineering

3. Programme structure and learning outcomes

B.Eng (Hons) Engineering (Automotive)

To be awarded B.Eng (Hons) Engineering (Automotive), students will achieve 120 credits at Level 6 made up of 90 credits from the list of compulsory modules and 30 credits from the optional modules listed below:

Programme Structure - LEVEL 6					
Compulsory modules	**Credit points**	**Optional modules** **Students must complete a further 2 modules/30 credits from the following optional modules:**	**Credit points**	**Is module compensatable?**	**Semester runs in**
D0B00 Team Project	30	D5B083 Quality Techniques	15	N/A	N/A
D5B01 Innovation and Design for Sustainability	15	D5B093 Advanced Fluid Mechanics	15		
D5B02 Engineering Applications of Mathematical Modelling	15	D5B084 Strength of Materials	15		
D5B07 Business and Environmental Challenges	15				
D5B06 Power Train Systems Development and Calibration	15				
Total credits	**90**				

To be awarded B.Eng Engineering, students will achieve 300 credits in total (60 credits from the compulsory modules from level 6 not including Team Project).

B.Eng (Hons) Engineering (Mechanical)

To be awarded B.Eng (Hons) Engineering (Mechanical), students will achieve 120 credits at Level 6 made up of 90 credits from the list of compulsory modules and 30 credits from the optional modules listed below:

Programme Structure - LEVEL 6					
Compulsory modules	**Credit points**	**Optional modules: Students must complete a further 2 modules/30 credits from the following optional modules:**	**Credit points**	**Is module compensatable?**	**Semester runs in**
D0B080 Team Project	30	D5B083 Quality Techniques	15	No	N/A
D5B081 Innovation and Design for Sustainability	15	D5B093 Advanced Fluid Mechanics	15		
D5B082 Engineering Applications of Mathematical Modelling	15	D5B084 Strength of Materials	15		
D5B087 Business and Environmental Challenges	15				
D5B092 Advanced Thermodynamics	15				
Total credits	**90**				

To be awarded B.Eng Engineering, students will achieve 300 credits in total (60 credits from the compulsory modules from level 6 not including Team Project).

B.Eng (Hons) Engineering (Electronic)

To be awarded B.Eng (Hons) Engineering (Electronic), students will achieve 120 credits at Level 6 made up of 90 credits from the list of compulsory modules and 30 credits from the optional modules listed below:

Programme Structure - LEVEL 6					
Compulsory modules	**Credit points**	**Optional modules: Students must complete a further 2 modules/30 credits from the following optional modules:**	**Credit points**	**Is module compensatable?**	**Semester runs in**
D0B080 Team Project	30	D5B059 Construction and Functionality of Analogue Devices	15	No	N/A
D5B081 Innovation and Design for Sustainability	15	D5B091 Digital Communications Networks	15		
D5B082 Engineering Applications of Mathematical Modelling	15	D5B083 Quality Techniques	15		
D5B087 Business and Environmental Challenges	15				
D5B090 Advanced Digital Techniques	15				
Total credits	**90**				

To be awarded B.Eng Engineering, students will achieve 300 credits in total (60 credits from the compulsory modules from level 6 not including Team Project).

B.Eng (Hons) Engineering (Electrical)

To be awarded B.Eng (Hons) Engineering (Electrical), students will achieve 120 credits at Level 6 made up of 90 credits from the list of compulsory modules and 30 credits from the optional modules listed below:

Programme Structure - LEVEL 6					
Compulsory modules	**Credit points**	**Optional modules: Students must complete a further 2 modules/30 credits from the following optional modules:**	**Credit points**	**Is module compensatable ?**	**Semester runs in**
D0B080 Team Project	30	D5B089 Construction and Functionality of Analogue Devices	15	No	N/A
D5B081 Innovation and Design for Sustainability	15				
D5B087 Engineering Applications of Mathematical Modelling	15	D5B083 Quality Techniques	15		
D5B082 Business and Environmental Challenges	15	D5B091 Digital Communications Networks	15		
D5B088 Electrical Power Transmission Systems	15				
Total credits	**90**				

To be awarded B.Eng Engineering, students will achieve 300 credits in total (60 credits from the compulsory modules from level 6 not including Team Project).

B.Eng (Hons) Engineering (Manufacturing)

To be awarded B.Eng (Hons) Engineering (Manufacturing), students will achieve 120 credits at Level 6 made up of 90 credits from the list of compulsory modules and 30 credits from the optional modules listed below:

Programme Structure Level 6					
Compulsory modules	**Credit points**	**Optional modules: Students must complete a further 2 modules/30 credits from the following optional modules:**	**Credit points**	**Is module compensatable?**	**Semester runs in**
D0B080 Team Project	30	D5B083 Quality Techniques	15		
D5B081 Innovation and Design for Sustainability	15	D5B093 Advanced Fluid Mechanics	15	No	N/A
D5B087 Engineering Applications of Mathematical Modelling	15	D5B084 Strength of Materials	15		
D5B087 Business and Environmental Challenges	15				
D5B085 Advanced Manufacturing Techniques	15				
Total credits	**90**				

To be awarded B.Eng Engineering, students will achieve 300 credits in total (60 credits from the compulsory modules from level 6 not including Team Project).

Intended learning outcomes at Level 6 are listed below:

Learning Outcomes – LEVEL 6	
3A. Underpinning science and mathematics, and associated engineering disciplines, as defined by the relevant engineering institution	
Learning outcomes:	**Learning and teaching strategy/ assessment methods**
On completion of the programme students will be able to: **A1:** Knowledge and understanding of scientific principles and methodology necessary to underpin their education in their engineering discipline, to enable appreciation of its scientific and engineering context, and to support their understanding of historical, current, and future developments and technologies; **A2:** Knowledge and understanding of mathematical principles necessary to underpin their education in their engineering discipline and to enable them to apply mathematical methods, tools and notations proficiently in the analysis and solution of engineering problems; **A3:** Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of their own engineering discipline; **A4:** Awareness of quality issues.	Students will be expected to demonstrate a sound knowledge and a systematic understanding of principles and techniques and their applications in engineering contexts by completing formal examinations and coursework. Assessments will be designed so that students will be able to devise and sustain arguments, and/or to solve problems, using ideas and techniques. These skills are assessed primarily in the Engineering Applications of Mathematical Modelling, Advanced Fluid Mechanics, Advanced Thermodynamics and Quality Techniques modules. The ability to apply scientific methods to analysis is assessed in the Power Train Systems Development and Calibration, Electrical Power Transmission, Innovation and Design for Sustainability modules. Students' awarenes of quality issues and the process of mangaing costs and resources is assessed through case studies and analysis of given data in simulated tasks in coursework assignments in the Business and Environmental Challenges, Quality Techniques, and Team Project modules. Students at level 6 will have the ability to manage their own learning, and to make use of scholarly reviews and primary sources e.g. refereed research articles and/or original materials appropriate to the discipline. Students will be expected to demonstrate critical and reflective analysis of the quality of reference materials, the variability of design and test data and the applicability of techniques to engineering problems. These skills will be assessed through individualised coursework and in most cases these are applied to a work context chosen by the student. In the Team Project

Learning Outcomes – LEVEL 6	
3A. Underpinning science and mathematics, and associated engineering disciplines, as defined by the relevant engineering institution	
	module, these outcomes are assessed by an oral presentation, a significant evaluative report and by analysing case studies in coursework assignments. In optional modules, students are assessed through the analysis of a real world work scenario. Some element of formal examination is retained to ensure the reliability of assessment, particularly in Advanced Thermodynamics, Advanced Fluid Mechanics and Electrical Power Transmission. (See the module specifications for individual assessment strategies). In the Team Project module, students will also be expected to apply the principles of quality improvement techniques to their chosen project when critically analysing the outcomes. This may involve value analysis, design for manufacture, capability studies and other techniques applied at the design and development stage rather than in mass manufacture.

3B. **Cognitive skills:** Intellectual skills (Engineering Analysis).	
Learning outcomes:	**Learning and teaching strategy/ assessment methods**
On completion of the programme students will be able to: **B1:** Understanding of engineering principles and the ability to apply them to analyse key engineering processes; **B2:** Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques; **B3:** Ability to apply quantitative methods and computer software relevant to their engineering discipline, in order to solve engineering problems; **B4:** Understanding of and ability to apply a systems approach to engineering problems; **B5:** Understanding of contexts in which engineering knowledge can be applied (eg operations and management, technology development, etc); **B6:** Ability to work with technical uncertainty.	Cognitive and intellectual skills are developed within the modules throughout the programme and assessed by the application of research and analysis techniques to real world engineering scenarios. This will require students to use appropriate computer simulation and analysis techniques to assist in problem solving and to independently implement chosen solutions. Students will be expected to apply the methods and techniques that they have learned to review, consolidate, extend and apply their knowledge and understanding, and to initiate and carry out projects within industrial and commercial contexts. This will be assessed through coursework assignments in Engineering Applications of Mathematical Modelling, the Team Project, Quality Techniques, Power Trains Systems Development and Calibration, Electrical Power Transmission Systems and Advanced Digital Techniques. The ability to source, review, extract, cite and reference relevant technical information from credible sources will be assessed by written coursework in all of the modules and 10% of the marks have been reserved for this purpose in all of the assignments. Students will critically analyse and implement aesthetics, social, cultural, environmental and wider professional responsibilities of an engineer and this will be evident in his Team project, Innovation and Design, Business and Environment Challenges and Power Train Systems development and Calibration. They are also required to critically evaluate the effectivenes of chosen technological approaches and engineering techniques. This will be assessed through mini-projects set as coursework assignments in specialist modules such as Power Train Systems Deveopment and Calibration; and through the main Project module. In particular the application of advanced

3B. **Cognitive skills:** Intellectual skills (Engineering Analysis).	
	numerical and analytical techniques at a systems level, will be assessed in the pathway core modules at Level 6. Students will evaluate computer modelling techniques and professional software packages which are used to solve engineering problems and processes. In the module Engineering Applications of Mathematical Modelling, students will apply software packages and object orientated programming to perform mathematical modelling. In Power Trains System Development and Calibration students will evaluate software used to calibrate the power trains systems in the automotive industry. Students will undertake critical analysis of need, including the appropriateness of a range of techniques such as statistical tools for quality and reliability, in a range of industrial situations, with a focus on business improvement.

3C. Practical & Professional Skills (including Design)	
Learning outcomes:	**Learning and teaching strategy/ assessment methods**
On completion of the programme students will be able to: **C1:** Investigate and define a problem and identify constraints including environmental and sustainability limitations, health and safety and risk assessment issues; **C2:** Understand customer and user needs and the importance of considerations such as aesthetics; **C3**: Identify and manage cost drivers; **C4:** Use creativity to establish innovative solutions; **C5:** Ensure fitness for purpose for all aspects of the problem including production, operation, maintenance and disposal; **C6:** Manage the design process and evaluate outcomes. **C7:** Workshop and laboratory skills; **C8:** Knowledge of characteristics of particular materials, equipment, processes, or products; **C9:** Knowledge and understanding of commercial and economic context of engineering processes;	Practical skills are developed within the modules throughout the programme and where necessary taught in laboratory or workshop settings. Students will benefit from the use of industry standard test and measurement equipment. They will also utilise advanced sytems modelling and simulation software that they are likley to encounter currently in industry. Students are set practical tasks in the design of components, processes or systems. In the Team Project Module: A students ability to plan and manage the implementation of a complex project is assessed through a series of coursework assignments which require students to critically assess the feasibility of a project, to develop a technical specification and to manage the project through to completion. At this level it is expected that students work both independently and in small teams. They will be required to work with other technical specialists and resource managers to achieve their aims. The project will be required to include a significant element of design (either component, product, system, process or methodology) and students will be assessed on their ability to innovate using a combination of existings designs, novel implementations and new creations. Students will be required to critically reflect on both the fitness for purpose of the final output and the effectiveness of the problem solving methods chosen. Students will be expected to critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgements, and to frame appropriate questions to achieve a solution - or identify a range of solutions - to a problem. Students will be able to extend and apply the knoweldge gained at Level 6 of the

3C. Practical & Professional Skills (including Design)	
C10: Knowledge of management techniques which may be used to achieve engineering objectives within that context;	programme while studying Power Train System Development and Calibration, Innovation and Design, Electrical Power Transmission Systems, Advance Digital Techniques and devise ways and/or design products or processes for sustainable development and to help improve economic performance.

3D. Key/transferable skills	
Learning outcomes:	
On completion of the programme students will be able to: **D1:** Present and discuss proposals; **D2:** Understanding use of technical literature and other information sources; **D3:** Plan self-learning and improving performance, as the foundation for lifelong learning/CPD; **D4:** Communicate information, ideas, problems and solutions to both specialist and non-specialist audiences; **D5:** Present written material in English, in a coherent and organised form, with arguments and information set out in a logical sequence, and with sources referenced in an appropriate way. **D6:** Understanding of different roles within an engineering team and the ability to exercise initiative and personal responsibility, which may be as a team leader or member.	Transferable skills are developed across the full range of programme modules by ensuring that approaches to problem solving utilise modern computing techiques and by requiring students to present coursework in a variety of technical report, essay and protfolio styles which require use of advanced IT and presentation skills. The Team Project module in partcular is used to assess the students' ability to present personal and technical information in a variety of formats and through an oral presentation. Use of IT to perform research and to present analysis results and technical information is assessed by way of a detailed and technically critical report on the engineering aspects of their role. In addition, a variety of coursework assessments in the Innovation and Design for Sustainability and Business and Environment Challenges ensure that effective communication in English is employed. 10% of coursework marks are reserved for writing style, referencing, presentation and the good use of English. It is expected that students will be able to plan for lifelong learning at this stage and be able to demonstrate their own skills profile, their development needs and the limitations of their knowledge base in professional applications. This includes reflection upon the personal and social skills required to effectively participate in team activities. The essay and report style assessements for this and the Project module provide an opportunity for students to demonstate a range of communications skills and critically reflect upon them. The oral component of the Project assessment provides a further opportunity for students to demonstrate increased confidence and their ability handle complex technical questioning.

3E. Professional Standards	
Learning outcomes:	
On completion of the programme students will be able to demonstrate an: **E1:** Awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues; **E2:** Understanding of the need for a high level of professional and ethical conduct in engineering. **E3:** Understanding of appropriate codes of practice and industry standards; **E4:** Understanding of the requirement for engineering activities to promote sustainable development; **E5:** Awareness of nature of intellectual property and contractual issues;	The development of safe, ethical and environmentally sound professional practice will be emphasised throughought the programme. Students will be introduced to relevant environmental legislation, workplace practices, codes of conduct and professional and ethical standards in the Business and Environment Challenges and Innovation and Design for Sustaianbility module. Students will be assessed on their ability to consider a range of external factors, legal and moral constraints on an engineering scenario. Students will have already explored the framework for professional competence at Level 5 and will have been assessed on their ability to plan a personal development programme which addresses the UK-SPEC requirements for adherence to safe working practices and ethical behaviour. During practical and investigative work students will become familiar with safe systems of working and they will demonstrate awarness of these as part of their assessed portfolio in the Team Project module. The final project report will also require students to demonstrate an understanding of the potential environmental impact of their solution and to suggest ways in which sustainable development goals could be incorporated into their practice. Some of the assessments will be scenrio based including the assessment in the Innovation and Design for Sustainability module which requires students to plan and implement best practice environmental management systems, within environmental legislation to achieve “triple bottom line” (i.e. social, economic and environmental) outcomes. Students ability to operate and act responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously will be assessed through coursework assignments in the Power Train Systems

3E. Professional Standards	
	Development and Calibration module and also through the Innovation and Design for Sustainable Development module. In these assessments they will be expected to use imagination, creativity and innovation to evaluate environmental impacts and suggest products and services which maintain and enhance the quality of the environment and community and meet financial objectives.

4. Distinctive features of the programme structure

- **Where applicable, this section provides details on distinctive features such as:**
- **where in the structure above a professional/placement year fits in and how it may affect progression**
- **any restrictions regarding the availability of elective modules**

where in the programme structure students must make a choice of pathway/route

This degree has been developed in conjunction with employers to ensure that its aims are current and meet the needs of local industry hence the five different pathways.

The extent of employer involvement in this programme is exceptional. Regular meetings are held with senior managers at Ford Motor Company and they are appraised of the progress and attendance of the students/employees. Ford Motor Company provide outstanding support to students engaged in project work by organising drop-in workshops with senior engineers. Other employers such as UK Power Networks and e2V have strong partnerships with the college and provide significant input to the development of modules and assessment methods.

5. Support for students and their learning

Students have a range of support structures available to them dependent on their specific needs. These include:

- A personal tutor – all students are allocated a personal tutor whose role it is to offer academic and professional support throughout the time the student is on the programme.
- Academic skills support – a structured induction led by the academic team and supported by colleagues from other areas of the college (Learning Resources Centres, Quality and Standards and Learning Support) serves to underpin academic skills appropriate to higher education study. This is further supported by ongoing academic skills sessions focusing on specific issues during the modules of the programme where the students are able to share ideas and knowledge and receive lecturer and peer support around specific academic skills.

- HE learning support officer and lecturer in academic study skills HE - a dedicated member of staff is employed to offer support to HE students with disabilities or learning difficulties (LDD). Diagnostic assessment can be undertaken for specific learning difficulties; referrals made for other assessments that may be required; support provided with accessing DSA funding and finding appropriate support workers as required.
- ESOL support for HE students – although there are clear expectations that those entering the programme will have demonstrated that they have sound written and verbal communication skills there may be a need for some students to receive additional support in relation to English as an additional language.
- HE Student Development Worker – One part-time HE development adviser is employed to work specifically with HE students on the Quarles campus of the college. This member of staff is able to provide guidance and advice on a range of issues in relation to college policies and procedures, personal and financial issues. This member of staff also works to develop and support StARS (Student Academic Representatives) in representing the views of their cohorts on programme and college-wide issues.
- Counsellor – if personal problems become such that personal tutors and student services advisors are no longer able to support individual students, the college employs a counsellor who students may either self-refer or be referred to for additional support.

Personal development planning (PDP) is embedded throughout the programme.

6. Criteria for admission

Applicants must have completed 240 credits of relevant study of at least 120 credits at L4 and 120 credits at L5, before progressing onto the B.Eng. (Hons) Engineering with pathways.

Applicants whose first language is not English will be required to provide evidence that they meet **IELTS level 6.**

Applicants may be required to attend an interview prior to enrolment.

7. Language of study

The language of study for this programme is English.

8. Information about non-OU standard assessment regulations (including PSRB requirements)

The college works within Assessment Regulations (September 2017) that have been written by the Open University (OUVP).

9. Methods for evaluating and improving the quality and standards of teaching and learning.

Havering College has well developed mechanisms for receiving and evaluating standards of teaching and learning. These include:

1. Course board of studies meetings with student representatives, twice each year.
2. Focus groups undertaken by senior managers with student cohorts from HE programmes.
3. End of module evaluation questionnaires.
4. Teaching and Learning observations.
5. Staff appraisals.
6. External Examiner visits and reports.

7. Student meetings with an Academic Reviewer from the Open University (OU).

8. An Annual Programme Evaluation Report written by the programme staff and scrutinised by students at the course board of studies meeting in October of each academic year. All reports are scrutinised at college level by the Higher Education Quality department.

The student feedback is collated and subsequently discussed in the following ways:

- at team and planning meetings
- at HE Strategy and Operations (HESOG) meetings held bi-monthly

A database is kept by HE Quality and Standards which draws together all feedback collected and determines if action is needed. Responsibility against the action is allocated to the most appropriate member of staff and this is then tracked until sufficient progress has been made. The HESOG group then receives feedback from this database and areas of commonality are discussed and resolutions suggested. Student representatives attend this group and can then feedback to their peers.

10. Changes made to the programme since last (re)validation

The curriculum content has been reviewed in light of subject benchmark changes and industry developments. Indicative content has been updated across all modules and book lists have been reviewed and updated. Assessment tasks also have been reviewed and amendments made.

A Annexe 1 - Curriculum map B.Eng (Hons) in Engineering (Automotive)

This table indicates which study units assume responsibility for delivering (shaded) and assessing (✓) particular programme learning outcomes.

B.Eng (Hons) in Engineering (Automotive) (Core and Pathway Modules)

	Programme Outcomes																														
Study module/unit	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	**E3**	**E4**	**E5**
Engineering Applications of Mathematical Modelling	✓	✓			✓	✓	✓	✓		✓							✓														
Innovation and Design for Sustainability									✓		✓	✓		✓	✓						✓	✓			✓		✓		✓	✓	
Business and Environmental Challenges				✓									✓						✓	✓		✓		✓	✓			✓		✓	✓
Team Project			✓	✓					✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓				✓	✓
Power Train Systems Development and Calibration	✓	✓			✓	✓	✓	✓		✓							✓	✓							✓						

B.Eng (Hons) in Engineering (Automotive) Optional Modules

	Programme Outcomes																														
Study module/unit	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	**E3**	**E4**	**E5**
Strength of Materials	✓	✓			✓	✓	✓	✓									✓	✓													
Advanced Fluid Mechanics	✓	✓			✓	✓	✓										✓	✓													
Quality Techniques		✓		✓			✓		✓									✓		✓					✓						

Annexe 2 - Curriculum map B.Eng (Hons) in Engineering (Mechanical)

This table indicates which study units assume responsibility for delivering (shaded) and assessing (✓) particular programme learning outcomes.

B.Eng (Hons) in Engineering (Mechanical) (Core and Pathway Modules)

	Programme Outcomes																														
Study module/unit	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	**E3**	**E4**	**E5**
Engineering Applications of Mathematical Modelling	✓	✓			✓	✓	✓	✓		✓							✓														
Innovation and Design for Sustainability									✓		✓	✓		✓	✓						✓	✓			✓		✓		✓	✓	
Business and Environmental Challenges				✓									✓						✓	✓		✓		✓	✓			✓		✓	✓
Team Project			✓	✓					✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓				✓	✓
Advanced Thermodynamics	✓	✓			✓	✓	✓	✓		✓							✓	✓													

B.Eng (Hons) in Engineering (Mechanical) (Optional Modules)

	Programme Outcomes																														
Study module/unit	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	**E3**	**E4**	**E5**
Strength of Materials	✓	✓			✓	✓	✓	✓									✓	✓													
Advanced Fluid Mechanics	✓	✓			✓	✓	✓										✓	✓													
Quality Techniques		✓		✓			✓		✓									✓		✓					✓						

Annexe 3 - Curriculum map B.Eng (Hons) in Engineering (Electrical)

This table indicates which study units assume responsibility for delivering (shaded) and assessing (✓) particular programme learning outcomes.

B.Eng (Hons) in Engineering (Electrical) (Core and Pathway Modules)

	Programme Outcomes																														
Study module/unit	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	**E3**	**E4**	**E5**
Engineering Applications of Mathematical Modelling	✓	✓			✓	✓	✓	✓		✓							✓														
Innovation and Design for Sustainability									✓		✓	✓		✓	✓						✓	✓			✓		✓		✓	✓	
Business and Environmental Challenges				✓									✓						✓	✓		✓		✓	✓			✓		✓	✓
Team Project			✓	✓					✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓				✓	✓
Electrical Power Transmission Systems	✓	✓			✓	✓	✓	✓		✓							✓	✓							✓						

B.Eng (Hons) in Engineering (Electrical) (Optional Modules)

	Programme Outcomes																														
Study module/unit	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	**E3**	**E4**	**E5**
Digital Communications and Networks	✓	✓			✓	✓	✓	✓										✓							✓						
Construction and Functionality of Analogue Devices	✓	✓			✓	✓	✓	✓									✓	✓													
Quality Techniques		✓		✓			✓		✓									✓		✓					✓						

Annexe 4 - Curriculum map B.Eng (Hons) in Engineering (Electronics)

This table indicates which study units assume responsibility for delivering (shaded) and assessing (✓) particular programme learning outcomes.

B.Eng (Hons) in Engineering (Electronics) (Core and Pathway Modules)

	Programme Outcomes																														
Study module/unit	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	**E3**	**E4**	**E5**
Engineering Applications of Mathematical Modelling	✓	✓			✓	✓	✓	✓		✓							✓														
Innovation and Design for Sustainability									✓		✓	✓		✓	✓						✓	✓			✓		✓		✓	✓	
Business and Environmental Challenges				✓									✓						✓	✓		✓		✓	✓			✓		✓	✓
Team Project			✓	✓					✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓				✓	✓
Advanced Digital Techniques	✓	✓			✓	✓	✓	✓		✓							✓	✓													

B.Eng (Hons) in Engineering (Electronics) (Optional Modules)

	Programme Outcomes																														
Study module/unit	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	**E3**	**E4**	**E5**
Digital Communications and Networks	✓	✓			✓	✓	✓	✓										✓							✓						
Construction and Functionality of Analogue Devices	✓	✓			✓	✓	✓	✓									✓	✓													
Quality Techniques		✓		✓			✓		✓									✓		✓					✓						

Annexe 5 - Curriculum map B.Eng (Hons) in Engineering (Manufacturing)

This table indicates which study units assume responsibility for delivering (shaded) and assessing (✓) particular programme learning outcomes.

B.Eng (Hons) in Engineering (Manufacturing) (Core and Pathway Modules)

	Programme Outcomes																														
Study module/unit	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	**E3**	**E4**	**E5**
Engineering Applications of Mathematical Modelling	✓	✓			✓	✓	✓	✓		✓							✓														
Innovation and Design for Sustainability									✓		✓	✓		✓	✓						✓	✓			✓		✓		✓	✓	
Business and Environmental Challenges				✓									✓						✓	✓		✓		✓	✓			✓		✓	✓
Team Project			✓	✓					✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓				✓	✓
Advanced Manufacturing Techniques				✓	✓	✓			✓	✓							✓	✓							✓						

B.Eng (Hons) in Engineering (Manufacturing) (Optional Modules)

	Programme Outcomes																														
Study module/unit	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**E1**	**E2**	**E3**	**E4**	**E5**
Strength of Materials	✓	✓			✓	✓	✓	✓									✓	✓													
Advanced Fluid Mechanics	✓	✓			✓	✓	✓										✓	✓													
Quality Techniques		✓		✓			✓		✓									✓		✓					✓						

Annex 6 - Curriculum map

B.Eng Engineering ordinary degree exit award

This table indicates which study units assume responsibility for delivering (shaded) and assessing (✓) particular programme learning outcomes

Students need 60 credits from the core modules (Engineering Applications of Mathematical Modelling; Innovation and Design for Sustainability; Business and Environmental Challenges) and relevant compulsory module to the specific pathway to achieve a B.Eng Engineering ordinary degree exit award.

	Programme Outcomes																														
Study module/unit	A1	A2	A3	A4	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	D1	D2	D3	D4	D5	D6	E1	E2	E3	E4	E5
Core modules																															
Engineering Applications of Mathematical Modelling	✓	✓			✓	✓	✓	✓		✓							✓														
Innovation and Design for Sustainability									✓		✓	✓		✓	✓						✓	✓			✓		✓		✓	✓	
Business and Environmental Challenges				✓									✓						✓	✓		✓		✓	✓			✓		✓	✓
Pathway compulsory module																															
Power Train Systems Development and Calibration (automotive)	✓	✓			✓	✓	✓	✓		✓							✓	✓							✓						
Advanced Thermodynamics (mechanical)	✓	✓			✓	✓	✓	✓		✓							✓	✓													
Electrical Power Transmission Systems (electrical)	✓	✓			✓	✓	✓	✓		✓							✓	✓							✓						
Advanced Digital Techniques (electronic)	✓	✓			✓	✓	✓	✓		✓							✓	✓													
Advanced Manufacturing Techniques (manufacturing)				✓	✓	✓			✓	✓							✓	✓							✓						

Annexe 2: Notes on completing programme specification templates

1 **-** This programme specification should be mapped against the learning outcomes detailed in module specifications.

2 – The expectations regarding student achievement and attributes described by the learning outcome in section 3 must be appropriate to the level of the award within the **QAA frameworks for HE qualifications**: http://www.qaa.ac.uk/AssuringStandardsAndQuality/Pages/default.aspx

3 – Learning outcomes must also reflect the detailed statements of graduate attributes set out in **QAA subject benchmark statements** that are relevant to the programme/award: http://www.qaa.ac.uk/AssuringStandardsAndQuality/subject-guidance/Pages/Subject-benchmark-statements.aspx

4 – In section 3, the learning and teaching methods deployed should enable the achievement of the full range of intended learning outcomes. Similarly, the choice of assessment methods in section 3 should enable students to demonstrate the achievement of related learning outcomes. Overall, assessment should cover the full range of learning outcomes.

5 - Where the programme contains validated **exit awards** (e.g. CertHE, DipHE, PGDip), learning outcomes must be clearly specified for each award.

6 - For programmes with distinctive study **routes or pathways** the specific rationale and learning outcomes for each route must be provided.

7 – Validated programmes delivered in **languages other then English** must have programme specifications both in English and the language of delivery.