

**Programme Specification for Undergraduate Programme  
Leading to:  
MEng Mechanical Engineering  
MEng Mechanical Engineering with Placement**



Applicable for all undergraduate students **starting at Level 4** in 2021

<u>Version No.</u>	<u>Date</u>	<u>Notes – QA USE ONLY</u>	<u>QAO</u>
2021-22 v1	17 August 2021	Programme specification for 2021/22 entrants. Level 7 codes to be added later this academic year.	JP

<b>Undergraduate Programme</b>	
1. Awarding institution	Brunel University London
2. Teaching institution(s)	Brunel University London
3. Home college/department/division	College of Engineering, Design and Physical Sciences Dept of Mechanical and Aerospace Engineering Mechanical Engineering
4. Contributing college/department/division/ associated institution	Department of Mathematics; Department of Civil Engineering, Department of Electronic and Electrical Engineering, Department of Chemical Engineering
5. Programme accredited by	Institution of Mechanical Engineers (IMechE)
6. Final award(s) and FHEQ Level of Award	MEng (Hons) Mechanical Engineering (FHEQ level 7) MEng Mechanical Engineering with Placement (FHEQ level 7)
7. Programme title	MEng (Hons) Mechanical Engineering
8. Programme type (Single honours/joint)	Single Honours
9. Normal length of programme (in months) for each mode of study	48 months FT; 60 months Sandwich
10. Maximum period of registration for each mode of study	Normal length of programme (as defined above in 9) + 3 years
11. Variation(s) to September start	None
12. Modes of study	Standard
13. Modes of delivery	Full-time; Thick Sandwich
14. Intermediate awards and titles and FHEQ Level of Award	CertHE Mechanical Engineering (FHEQ level 4) DipHE Mechanical Engineering (FHEQ level 5) DipHE Mechanical Engineering with Placement (FHEQ level 5) BEng (Ord) Mechanical Engineering (FHEQ level 6) BEng (Hons) Mechanical Engineering (FHEQ level 6) BEng (Hons) Mechanical Engineering with Placement (FHEQ level 6) BEng (Ord) Mechanical Engineering with Placement (FHEQ level 6)
15. UCAS Code	FT: H301; SW: H302
16. HECoS Code	100190 (Mechanical Engineering)
17. Route Code	H300UMMECENG

<p>18. Relevant subject benchmark statements and other external and internal reference points used to inform programme design.</p>	<p><a href="#">UK Quality Code for Higher Education</a>  <a href="#">QAA Subject Benchmark Statement</a> (Engineering)  <a href="#">Brunel 2030</a>  Brunel Placement Learning Policy, as published under the 'Placements' section of the '<a href="#">Managing Higher Education Provision with Others</a>' page.</p> <p>Useful Pdf links:-the Engineering Benchmark Statement (<a href="http://www.qaa.ac.uk/en/Publications/Documents/Subject-benchmark-statement-Engineering-.pdf">http://www.qaa.ac.uk/en/Publications/Documents/Subject-benchmark-statement-Engineering-.pdf</a>)</p> <p>the Framework for Higher Education Qualifications (<a href="http://www.qaa.ac.uk/en/Publications/Documents/qualifications-frameworks.pdf">http://www.qaa.ac.uk/en/Publications/Documents/qualifications-frameworks.pdf</a>)</p> <p>Engineering Council: UK-Spec (<a href="https://www.engc.org.uk/ukspec">https://www.engc.org.uk/ukspec</a>)</p> <p>The Institution of Mechanical Engineers: Academic Accreditation Guidelines (<a href="https://www.imeche.org/docs/default-source/tapd/acd001-annex-1-academic-accreditation-guidelines.doc?sfvrsn=4">https://www.imeche.org/docs/default-source/tapd/acd001-annex-1-academic-accreditation-guidelines.doc?sfvrsn=4</a>)</p> <p>Brunel's Programme Approval Policy (<a href="http://www.brunel.ac.uk/about/quality-assurance/documents/pdf/Programme-Approval-Policy.pdf">http://www.brunel.ac.uk/about/quality-assurance/documents/pdf/Programme-Approval-Policy.pdf</a>)</p>
<p>19. Admission Requirements</p>	<p>Details of <a href="#">entry requirements</a> are provided on the University's and College website.  Levels of English for non-native speakers are outlined on Brunel International's <a href="#">language requirements</a> pages.</p>
<p>20. Other relevant information (e.g. study abroad, additional information on placements)</p>	<ul style="list-style-type: none"> <li>• The programme of study will involve visits to Mechanical engineering industry, timetabled outside the above programme of study.</li> <li>• A number of individual projects at Level 6 are expected to be on topics suggested and partly supervised by industry.</li> <li>• Industrial placement takes place in a mechanical related industry.</li> </ul>
<p>21. Programme regulations not specified in Senate Regulation 2. Any departure from regulations specified in Senate Regulation 2 must be stated here and approved by Senate.</p>	<ol style="list-style-type: none"> <li>1. Variation to SR2.16 – Level 6 Major Individual Project (30 credits) instead of 40 credits. Approved by Senate 23 September 2020.</li> <li>2. Where a student has failed the module L7-21 Major Group Project (45 credits) an exception to Senate Regulation 2 regarding the maximum amount of reassessment at Level 7 is allowed. The student will be permitted up to 45 credits of reassessment which will be applied to module L7-21 Major Group Project only.</li> </ol>
<p>22. Further information about the programme is available from the College website.</p>	<p>Course <a href="#">webpage</a>:  <a href="https://www.brunel.ac.uk/study/undergraduate/Mechanical-Engineering-MEng">https://www.brunel.ac.uk/study/undergraduate/Mechanical-Engineering-MEng</a></p>

## 23. EDUCATIONAL AIMS OF THE PROGRAMME

The Mechanical Engineering programme at Brunel University London is part of the Brunel Engineering Curriculum portfolio. As such, its aim is to produce graduates that are creative, knowledgeable, have perspective and are professional in their approach.

The programme will produce graduates equipped with comprehensive knowledge and understanding of the subject, its underlying principles and ability to apply them to complex engineering problems. They will possess analytical and computational skills, power of analysis of engineering problems, design skills, and transferable skills for demanding employment in the field of mechanical engineering and related topics, requiring the exercise of leadership, initiative, personal responsibility and decision making in complex and unpredictable situations. The graduates will have the independent ability required for continuing professional development and acquiring new skills at a high level. The programme also aims to provide new areas of teaching in response to the needs of industry and community.

## 24. PROGRAMME AND INTERMEDIATE LEARNING OUTCOMES

The programme provides opportunities for students to develop and demonstrate knowledge and understanding (K) cognitive (thinking) skills (C) and other skills and attributes (S) in the following areas:

Level	Category (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)	Learning Outcome	Associated Assessment Blocks Code(s)	Associated Study Blocks Code(s)	Associated Modular Blocks Code(s)
<b>4</b>					
	K [SM3m]	Knowledge, understanding, skills gathering and comprehension of the specific engineering disciplines relevant to engineering, including systems, mechanics and materials.			BE1603 BE1604 BE1606 ME1620
	K/C [SM1m]	Knowledge of the fundamental scientific principles that underpin an education relevant to engineering and demonstrating their application (e.g. basic energy and mass balance and fundamentals of thermodynamics and fluid mechanics)			BE1601 BE1603 ME1620
	K/C [SM2m]	Knowledge and understanding of the fundamental mathematical and statistical principles that underpin basic calculations in engineering			BE1601
	K/C [EA3m]	Apply a systems approach to identify the problems and apply core engineering principles to their analysis			BE1602 ME1620
	C [EA2, EA4m]	Ability to formulate basic problems, apply and demonstrate mathematical methods together with computational tools in the analysis of engineering problems			BE1601 ME1620 BE1604 BE1606
	C [EA1m, EA6m]	Ability to apply and demonstrate scientific principles to relevant engineering applications, collect, manipulate and interpret data (e.g. labs)			BE1602 ME1620
	K/S [P2m]	Knowledge and understanding in the use of computer tools in solving basic engineering problems.			BE1601 BE1602 ME1620
	S [EL3m]	Basic knowledge of management, entrepreneurship and safety culture			BE1602 ME1620
	S [D6,G1]	Effective communication of technical material, ethics demonstration, in the form of written reports and oral presentations			BE1602 BE1604 ME1620 BE1606
	S [P11m]	Working effectively as a member of a team; managing time and resources to given constraints			BE1602 ME1620
	S [D3m, P3, P8]	Safely operate laboratory and workshop equipment, obtain data and assess measurement error			BE1604 BE1606 ME1620

	K [SM1m]	A comprehensive synthesis and understanding of the principles, concepts and theories underpinning the study of mechanical engineering.			ME2610 ME2611 ME2613 ME2614 ME2616 ME2617
	K [SM2m]	Knowledge and critical understanding of fundamentals in mathematical and statistical methods underpinning the education in mechanical engineering.			ME2610 ME2613 ME2616
	K [SM3m]	Ability to use other engineering disciplines and evaluate critically the appropriateness of different approaches in order to support the study for mechanical engineering.			ME2610 ME2614 ME2616 ME2617
	K [SM4m]	Awareness of developing technologies related to mechanical engineering.			ME2616
	K [SM5m]	Understanding of mathematical and computational models relevant to mechanical engineering and an appreciation of their limitations.			ME2610 ME2614
	K, C [EA1m]	Understanding of engineering principles and the ability to apply them to undertake critical analysis of key mechanical engineering processes.			ME2611 ME2614 ME2616 ME2617
	C [EA2]	Ability to use analytical methods and modelling techniques for the understanding and assessment of systems in mechanical engineering.			ME2610 ME2611 ME2616 ME2617
	C [EA3m]	Use of alternative approaches, with understanding of their limitations, for the quantitative analysis and modelling of systems and structures for mechanical engineering.			ME2610 ME2613 ME2614 ME2617
	K, C [EA4m]	Understanding of, and the ability to apply, an integrated or systems approach to solving complex mechanical engineering problems.			ME2610 ME2611
	K,S [EA5m]	Ability to use fundamental knowledge to investigate new and emerging technologies in the field of automotive engineering.			ME2615 ME2616
	K [D2]	Understanding design process methods applied to engineering components and systems.			ME2611 ME2615

	K,C [D3m]	Work with information that may be incomplete or uncertain, quantify the effect of this on the design and, where appropriate, use theory or experimental research to mitigate deficiencies,			ME2611 ME2614 ME2615 ME2617
	K, C [D4]	Apply advanced problem-solving skills, technical knowledge and understanding, to establish rigorous and creative solutions that are fit for purpose for all aspects of the problem including production, operation, maintenance.			ME2611 ME2615
	K, C [D5]	Plan and manage the design process, including cost drivers, and evaluation of the outcomes, including a comprehensive understanding of the engineering materials and their applications in manufacturing processes for automotive engineering.			ME2611 ME2615
	S [D6]	Effective communication of technical material, in the form of written reports and oral presentations, and time management.			ME2613 ME2614 ME2615 ME2616 ME2617
	K [EL3m,EL6m, P4, P6, P8, P11m]	Understanding of the role of mechanical engineering in industry and commerce, including legal, health and safety requirements, quality issues as well as the role of the professional mechanical engineer and regulatory bodies.			ME2612
	K [EL1m]	Understanding of the need for a high level of professional and ethical conduct in engineering, a knowledge of professional codes of conduct and how ethical dilemmas can arise.			ME2612 ME2614
	K, C [P2m]	Comprehensive understanding of the characteristics of materials and processes for mechanical engineering.			ME2611 ME2614
	C, S [P3]	Ability to apply relevant practical and laboratory skills, including data acquisition and interpretation of experimental data.			ME2613 ME2614 ME2615 ME2616 ME2617
	K,S [P6]	Understanding of appropriate codes of practice and industry standards			ME2611 ME2612
	C [P8]	Ability to work with technical uncertainty.			ME2612 ME2615
	C,S [P11m]	Understanding of different roles within an engineering team and the ability to exercise initiative and personal responsibility, which may be as a team member or leader.			ME2612 ME2616

	S [G1]	Plan the project with identifiable objectives/milestones and timescale, and complete the project under given time and resource constraints. Effectively communicate the ideas and results within a written report and/or oral form.			ME2610 ME2612 ME2615
	S [G2]	Self-awareness of one's own skills as a coach or mentor and how these may be improved, thus understanding the employability qualities necessary for work requiring the exercise of initiative, professionalism and personal responsibility.			ME2612
	S [G3m]	Plan the project with identifiable objectives/milestones and timescale, and complete the project under given time and resource constraints. Effectively communicate the ideas and results within a written report and/or oral form.			ME2612
	S [G4]	Effectively and professionally manage the design process as part of a team.			ME2612 ME2615
	S	Adapt to the change in expectations and environments found during an industrial placement. ('with Placement' awards)			ME2555
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	K, C [SM1m]	Comprehensive synthesis and systematic understanding of the principles, concepts and theories underpinning the study of mechanical engineering.			ME3620 ME3621 ME3618 ME3622 ME3619 ME3623 ME3624
	K, C [SM2m]	Systematic understanding and knowledge of fundamentals of mathematical and statistical methods underpinning the education in mechanical engineering.			ME3620 ME3621 ME3618 ME3619 ME3624
	K [SM3m]	Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of their own engineering discipline and the ability to evaluate them critically and to apply them effectively.			ME3618 ME3622 ME3623 ME3624
	K, C [EA1m]	Systematic understanding of engineering principles and the ability to apply them to undertake critical analysis of key mechanical engineering processes.			ME3620 ME3621 ME3624
	K, S [EA2]	Ability to use analytical methods and modelling techniques for the comprehensive understanding and assessment of systems in mechanical engineering.			ME3620 ME3621 ME3622 ME3623

	K, C, S [EA3m]	Use of alternative approaches, with understanding of their limitations, for the quantitative analysis and modelling of systems and structures for mechanical engineering.			ME3621 ME3618 ME3622 ME3624
	C [EA4m]	Systematic application of appropriate techniques that may include theories, formulae, data, and experimental and/or numerical techniques to solve mechanical engineering problems presented by the project.			ME3620
	C [EA6m]	Systematic understanding of the role of mechanical engineering in industry and commerce, including legal, health and safety requirements, as well as risk assessment and risk management techniques.			ME3620 ME3621
	K [D1]	Systematic understanding of the multi-disciplinary nature of sustainability and stakeholder dynamics.			ME3619 ME3623
	K, S [D2]	Systematic understanding and appraisal of the mechanical engineering problems using a review of related literature and technical reports, including quality, environmental, health and safety issues.			ME3620 ME3619 ME3623
	C [D3m]	Critical assessment and analysis of results with appreciation of uncertainty, ambiguity and limits of knowledge in mechanical engineering projects.			ME3620 ME3621 ME3622 ME3619 ME3623
	K, C, S [D4]	Comprehensive knowledge of principles of the engineering design process, including objectives and methods to identify design requirements and apply formulae, data and experimental and/or numerical techniques for design problems.			ME3620 ME3619 ME3624
	C, S [D6]	Effective communication of technical material, in the form of written reports and oral presentations, and time management.			ME3620 ME3621 ME3622 ME3619 ME3623
	K [D7m]	Demonstrate wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations.			ME3619
	K,C [D8m]	Demonstrate the ability to generate an innovative design for products, systems, components or processes to fulfil new needs.			ME3619 ME3624
	K [EL1]	Systematic understanding of the need for a high level of professional and ethical conduct in engineering and knowledge of professional codes of conduct.			ME3619 ME3624

	K [EL2]	Comprehensive knowledge of environmental, quality, health and safety issues and relevant regulations in engineering business and appreciate the multi-disciplinary nature of sustainability and stakeholder dynamics, to ensure ethical and professional conduct as practicing engineers.			ME3621 ME3619
	K, S [EL3m]	Comprehensive knowledge and understanding of management techniques, including project and change management, that may be used to achieve engineering objectives, their limitations, and how they may be applied appropriately.			ME3620 ME3619
	K, S [EL4]	Systematic application of methods in the analysis, planning, resourcing, progressing, monitoring and control of mechanical engineering projects in a sustainable and, if possible, in a quantitative way.			ME3619
	K, S [EL5m]	Systematic understanding of the role of mechanical engineering in industry and commerce, including legal, health and safety requirements, quality issues as well as the role of the professional mechanical engineer and regulatory bodies.			ME3619
	C [EL6m]	Application of appropriate techniques that may include theories, formulae, data, and experimental and/or numerical techniques to solve automotive problems presented by the project.			ME3619
	K, S [P1]	Systematic understanding of the background to the problem using a review of related literature and technical reports. Appreciation of the context in which engineering knowledge is applied.			ME3620
	[P2m]	Comprehensive knowledge of characteristics of particular equipment, processes or products, with extensive knowledge and understanding of a wide range of engineering materials and components.			ME3622 ME3620
	C,S [P3]	Ability to apply relevant practical and laboratory skills, including data acquisition and interpretation of experimental data.			ME3621 ME3624
	K [P4]	Systematic understanding of the background to the problem using a review of related literature and technical reports.			ME3620 ME3618 ME3619
	K, S [P6]	Systematic understanding of the role of mechanical engineering in industry and commerce, including legal, health and safety requirements, quality issues as well as the role of the professional mechanical engineer and regulatory bodies.			ME3622 ME3619
	K, S [P6]	Understanding of appropriate codes of practice and industry standards.			ME3620



	C [P7]	Awareness of quality issues and their application to continuous improvement.			ME3619
	C [P8]	Critical assessment, analysis and interpretation of results for mechanical engineering projects.			ME3620 ME3621 ME3619
	K, C [P10m]	Ability to apply engineering techniques taking account of a range of commercial and industrial constraints			ME3624
	K, C [P11m]	Systematic understanding the roles within an engineering team and the ability to exercise initiative and personal responsibility, which may be as a team member or leader.			ME3619
	S [G1]	Technical report writing, time management and effective use of resources, hands-on experience with the use of engineering software. Effectively communicate the ideas and results within a written report and/or oral form.			ME3620 ME3621 ME3619
	S [G2]	Continuous development self-study and performance improvement in engineering activities.			ME3620 ME3618
	S [G3m]	Plan the project with identifiable objectives/milestones and timescale, and complete the project under given time and resource constraints.			ME3620 ME3621
	S [G4]	Exercise initiative and personal responsibility, which may be as a team member or leader.			ME3620 ME3619

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	K [SM1m]	A comprehensive synthesis and understanding of the principles, concepts and theories underpinning the study of mechanical engineering.			L7-21 L7-9 L7-10 L7-11 L7-12 L7-15 L7-16 L7-17 L7-18 L7-19 L7-20
	K, C [SM2m]	Ability to apply appropriate engineering methods for solving complex engineering problems and demonstrate the ability to critically evaluate elements of a design.			L7-10 L7-11 L7-12 L7-16 L7-17 L7-18 L7-19 L7-20

	K, C [SM3m]	Demonstrate a comprehensive understanding and critical ability to apply scientific and engineering principles and knowledge from other disciplines as part of an integrated sustainable design project, and critically apply appropriate analytical methods.			L7-21 L7-11 L7-12 L7-15
	K, C [SM4m]	Ability to apply and integrate knowledge and understanding of other engineering disciplines and developing technologies to support the study of mechanical engineering.			L7-10 L7-11 L7-12 L7-15 L7-16 L7-17 L7-18 L7-19 L7-20
	K [SM5m]	A comprehensive knowledge and understanding of mathematical and computational models relevant to the mechanical engineering discipline, and an appreciation of their limitations.			L7-9 L7-10 L7-11 L7-12 L7-15 L7-16 L7-17 L7-18 L7-19 L7-20
	K,C [SM6m]	Systematic understanding of concepts from a range of areas, including some outside engineering, and the ability to evaluate them critically and to apply them effectively in engineering projects.			L7-21 ME5661 L7-11 L7-18
	K, C [EA1m]	Systematic understanding of mechanical engineering principles and the ability to apply them to undertake critical analysis of key engineering processes.			L7-21 L7-10 L7-15
	K,C [EA2m]	Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques.			L7-10 L7-11 L7-12 L7-15 L7-16 L7-17 L7-18 L7-19 L7-20
	K,C [EA3m]	Ability to apply quantitative and computational methods, using alternative approaches and understanding their limitations, in order to solve mechanical engineering problems and implement appropriate action.			L7-9 L7-10 L7-11 L7-12 L7-15 L7-16 L7-17 L7-18 L7-19 L7-20

	K, C [EA4m]	Application of appropriate techniques that may include theories, formulae, data, and experimental and/or numerical techniques to solve complex mechanical engineering problems presented by the project.			L7-10 L7-11 L7-12 L7-15 L7-16 L7-17 L7-18 L7-19 L7-20
	C [EA5m]	Use of broad mechanical engineering knowledge and ability to independently research and apply technical information to evaluate potential impact of current research and development on future engineering practice.			ME5661 L7-10 L7-17 L7-20
	S [EA6m]	Ability to extract and evaluate pertinent data and to apply engineering analysis techniques in the solution of unfamiliar problems.			L7-10 L7-11 L7-17 L7-19 L7-20
	K, C [D1]	Systematic understanding and evaluating business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics.			L7-21
	K, C, S [D2]	Investigate and define the problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards.			L7-21
	K, C [D3m]	Work with information that may be incomplete or uncertain, quantify the effect of this on the design and, where appropriate, use theory or experimental research to mitigate deficiencies.			L7-9 L7-11 L7-12 L7-19 L7-20
	K, C [D4]	A synthesis of broad mechanical engineering knowledge and recognition of practical design drivers and constraints in order to establish rigorous and creative solutions that are fit for purpose for all aspects of aircraft design, including production, operation, maintenance and disposal.			L7-21 L7-10 L7-16
	C [D5]	Management of the design process, including cost drivers, and evaluation of outcomes.			L7-21
	S [D6]	Communicating information, opinions and arguments coherently and effectively. Using a balanced analysis supported by appropriate source materials. Research and technical report writing skills.			L7-21 L7-10 L7-18

	K [D7m]	Development of a sophisticated understanding of commercial, user, legal, environmental, health and safety and other needs and constraints in creating an effective mechanical engineering design.			L7-21 L7-18 L7-19 L7-20
	C [D8m]	Demonstrate the ability to generate an innovative design for products, systems, components or processes to fulfil new needs.			L7-21 L7-16
	K [EL1m]	Systematic understanding of the need for a high level of professional and ethical conduct in engineering, a knowledge of professional codes of conduct and how ethical dilemmas can arise.			L7-21
	K [EL2]	Comprehensive knowledge and understanding of the commercial, economic and social context of engineering processes.			ME5661 L7-15
	K, C [EL3m]	Comprehensive knowledge and understanding of management techniques, including project and change management, that may be used to achieve engineering objectives, their limitations, and how they may be applied appropriately.			L7-21 ME5661
	K [EL4]	Systematic understanding of organisations that pursue engineering business/designs, with particular reference to management of their risks and rewards, their responsibilities to society, legal, environmental health and safety and other needs and constraints in creating effective mechanical engineering designs.			L7-21
	C [EL5m]	Awareness of relevant legal requirements governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and liability issues.			L7-21 L7-17 L7-19 L7-20
	K [EL6m]	Comprehensive knowledge and understanding of risk issues, including health and safety, environmental and commercial risk, risk assessment and risk management techniques and an ability to evaluate commercial risk.			L7-21 ME5661 L7-17
	K [EL7m]	Systematic understanding of the key drivers for business success, including innovation, calculated commercial risks and customer satisfaction.			L7-21 L7-19 L7-20
	K [P1]	Systematic understanding of operations and management, application and development of technology. Awareness of quality issues and their application to continuous improvement.			ME5661 L7-11 L7-18
	K,C [P2m]	Comprehensive knowledge of characteristics of particular equipment, processes or products, with extensive knowledge and understanding of a wide range of engineering materials and components. Ability to apply relevant practical and laboratory skills.			ME5661 L7-10 L7-11 L7-15 L7-18

	C [P3]	Ability to apply relevant practical and laboratory skills, including data acquisition and interpretation of experimental data.			ME5661 L7-10 L7-11
	C,S [P4m]	Analyse and interpret specialist knowledge in mechanical engineering. Using a balanced analysis supported by appropriate source materials.			ME5661 L7-9 L7-10 L7-11 L7-15 L7-16 L7-18
	K [P5]	Comprehensive knowledge of relevant legal and contractual issues. Systematic understanding of appropriate codes of practice and industry standards.			L7-21
	K, S [P6]	Systematic understanding of the role of mechanical engineering in industry and commerce, including legal, health and safety requirements, quality issues as well as the role of the professional mechanical engineer and regulatory bodies.			L7-21 L7-11
	C [P7]	Awareness of quality issues and their application to continuous improvement.			ME5661 L7-15 L7-11
	K,C [P8m]	Ability to work with technical uncertainty.			ME5661 L7-15 L7-11
	K, C [P9m]	A thorough understanding of current practice in mechanical engineering and its limitations, and some appreciation of likely new developments.			L7-21 L7-11 L7-19 L7-20
	K, C [P10m]	Ability to apply engineering techniques taking account of a range of commercial and industrial constraints			L7-21
	K, C [P11m]	Systematic understanding the roles within an engineering team and the ability to exercise initiative and personal responsibility, which may be as a team member or leader.			L7-21 ME5661
	S [G1]	Plan the project with identifiable objectives/milestones and timescale, and complete the project under given time and resource constraints. Effectively communicate the ideas and results within a written report and/or oral form.			L7-21 ME5661 L7-9 L7-10 L7-11 L7-19 L7-20
	S [G2]	Self-awareness of one's own skills as a coach or mentor and how these may be improved, thus understanding the employability qualities necessary for work requiring the exercise of initiative, professionalism and personal responsibility.			ME5661 L7-9 L7-11 L7-19 L7-20

	S [G3m]	Plan the project with identifiable objectives/milestones and timescale, and complete the project under given time and resource constraints. Effectively communicate the ideas and results within a written report and/or oral form.			ME5661 L7-11 L7-17 L7-18
	S [G4]	Effectively and professionally manage the design process as part of a team.			L7-21 L7-11

**Learning/teaching strategies and methods** to enable learning outcomes to be achieved, including formative assessments

#### **Study**

Students will be introduced to subject material, including key concepts, information and approaches, through a mixture of standard lectures, tutorials and seminars, laboratory activities, field work, self study and individual research reports. Supporting material will be provided via the University's e-Learning platform. The aim is to challenge students and inspire them to expand their own knowledge and understanding.

#### **Work**

Preparation for work will be achieved through the development of 'soft' skills such as communication, planning, management and team work. This will be supported by the University's central services, principally the Library and ASK teams. In addition, guest speakers from industry will provide a valuable insight into the real world of mechanical engineering.

#### **Play**

Many of the practical activities in which the students engage develop into enjoyable experiences, for example working in teams for laboratory work and field work. A Mechanical Engineering Society, EQ8, run by the students (with staff support) forms the focus for many extra-curricular activities for all students within the Mechanical Subject Area.

#### **Grow**

Students are encouraged to develop personal responsibility throughout the course. Many elements of coursework involve, and reward, the use of initiative and imagination. Students are guided into this through the use of one-to-one tutorials. This aids them in developing reflective skills. Students on the Placement route record their personal development as part of the placement assessment, and are assisted in this by their industrial placement tutor and employer.

Experienced engineers working in industry will deliver selected parts of the programme, ensuring students are exposed to the practicalities of the industry and understand more of the world of work. A group poster conference (part of BE1602) will take place towards the end of FHEQ L4, with a range of industrial specialists invited to examine the posters and talk with the students. Students will also have the opportunity to work on industry-related projects at FHEQ L6 and L7.

The opportunity to think creatively, including producing novel designs, will be given at all levels, particularly:

FHEQ L4: BE1602 Engineering Practice; ME1620 Mechanical Engineering Science

FHEQ L5: ME2615 Elements of Engineering Design Project

FHEQ L6: ME3620 Major Individual Project; ME3618 Mechatronics and Control Engineering;

FHEQ L7: L7-21 Major Group Project;

**Summative assessment strategies and methods** to enable learning outcomes to be demonstrated.

To ensure any course related documentation is flexible and CMA compliant all assessments will be specified on module outlines as one of the following three:

- *Coursework*
- *In-person assessment*
- *Examination*

Every assessment type falls within these three categories.

#### **Coursework**

For example

- Essays – to develop skills in research (collecting, managing and interpreting evidence)
- Laboratory reports – to develop skills in interpretation of experimental, theoretical and computational findings and skills in communicating a systematic process and results
- Assignment to develop transferable skills
- Design labs – to develop and assess engineering design skills (including basic information, technology and computer aided design skills) and visual and written communication
- Individual major report - to develop advanced abilities in research and communication, further develop engineering design, development and/or analysis skills and assess knowledge and understanding
- Group reports – to develop team skills and assess understanding of the interactions between engineering design, development and analysis processes
- Project portfolios - to develop skills in gathering, integrating, evaluating and presenting information and data from a variety of sources

#### **In-person assessment**

Any assessment where the actions (verbal or non-verbal) of the student are being assessed in their presence and thus for which the student must be in attendance.

- Oral presentations – to develop and assess verbal presentation skills

#### **Examination**

- Examinations will be used to assess knowledge and understanding, ability to solve numerical and qualitative engineering problems and present a reasoned argument.

## 25. Programme Structure, progression and award requirements

Programme structures and features: levels, assessment blocks, credit and progression and award requirements

- **Compulsory block:** one which all students registered for the award are required to take as part of their programme of study. These will be listed in the left hand column;
- **Optional block:** one which students choose from an 'option range'. These will be listed in the right hand column;
- A **core assessment** is an assessment identified within an assessment block or modular block (either compulsory or optional) which must be passed (at grade D- or better) in order to be eligible to progress and to be eligible for the final award, (at FHEQ Level 7 the threshold is C- or better). All core assessments must be specified on the programme specification next to the appropriate assessment or modular block:

Where students are expected to pass the block at D- or better, (FHEQ Level 7 the threshold is C- or better), but not necessarily all elements, then the block itself is core.

e.g. AB3000 Project (40)  
Core: Block

Where only some elements of assessments are required to be passed at D- or better, (FHEQ Level 7 the threshold is C- or better), these will be identified by listing each element that is core

e.g. ABXXX1 Title (XX credits)  
Core: 1 & 4

Where students are expected to pass all assessments in a block then this will be identified. By setting the assessment this way, students are also required to pass the block by default. This will be identified thus:

e.g. ABXXXX Title (XX credits)  
Core: All, Block

- A **non-core assessment** does not have to be passed at grade D- or better, but must be better than a grade F, in order to progress and to be eligible for the final award. At FHEQ Level 7 the threshold is C- or better.

Level 4	
<b>Compulsory assessment block codes, titles and credits</b>	<b>Optional assessment block codes, titles and credits</b>
<b>Compulsory study block codes, titles and credit volume</b>	<b>Optional Study block codes, titles and credit volume</b>
<b>Compulsory modular block codes, titles and credits</b> BE1601 Engineering Mathematics & Programming (20) (Core) BE1602 Engineering Practice (20) BE1603 Engineering Systems and Energy (30) BE1604 Engineering Mechanics and Materials I (15) BE1606 Engineering Mechanics and Materials II (15) ME1620 Mechanical Engineering Science (20)	<b>Optional modular block codes, titles and credits</b>
<b>Level 4 Progression and Award Requirements</b>  <a href="#">As per Senate Regulation 2</a>	

Level 5	
<b>Compulsory study block codes, titles and credits</b>  ME2554 Mechanical Engineering Pre-placement (0 credits)	<b>Optional study block codes, titles and credits</b>  None
<b>Compulsory modular block codes, titles and credits</b>  <b>15 Credit Blocks:</b>  ME2610 Engineering Mathematics and Programming <b>Core Block</b> ME2611 Design Process for Machine Elements, Manufacturing Processes, Materials and CAD ME2612 Engineering Business <b>Core: Block</b> ME2613 Fluid Mechanics ME2614 Solid Mechanics and Intro to FEA ME2615 Engineering Design Team Project ME2616 Thermodynamics and Heat Transfer ME2617 Dynamics of Machines	<b>Optional modular block codes, titles and credits</b>  None
<b>Level 5 Progression and Award Requirements</b>  <a href="#">As per Senate Regulation 2</a>	

Level 5 – Sandwich Placement	
<b>Compulsory modular block codes, titles and credits</b>  This block is only a requirement for the 'with Placement' awards.  ME2555 Work Placement (120) <b>Core: Block</b>	<b>Optional modular block codes, titles and credits</b>  None
<b>Level 5 Placement Progression and Award Requirements</b>  <a href="#">As per Senate Regulation 2</a> For DipHE, Mechanical Engineering, ME2555 will contribute 25% of the Level 5 profile  Module ME2555 may be undertaken between Levels 5 and 6, or between Levels 6 and 7. Students must also register on the IMechE MPDS scheme. Students must also register on the IMechE MPDS scheme. if they wish for their placement year to be accredited by the IMechE. If a student does not register it will not affect the title of the award made by the University.	



Level 6	
<p><b>Compulsory modular block codes, titles and credits</b></p> <p>ME3620 Major Individual Project (30) <b>Core: 1 and 3</b></p> <p>The student chooses the individual project topic in ME3620, subject to staff approval. The individual project topic must be relevant to mechanical engineering.</p> <p>ME3621 Applied Fluid Mechanics ME3618 Mechatronics and Control Engineering ME3622 Mechanical Engineering Structures</p> <p>ME3619 Sustainable Engineering Management and Practice <b>Core: Block</b></p> <p>ME3623 Design of Engineering Systems ME3624 Intro to AI Applications in Engineering</p>	<p><b>Optional modular block codes, titles and credits</b></p> <p>None</p>
<p><b>Level 6 Progression and Award Requirements</b></p> <p><a href="#">As per Senate Regulation 2</a></p> <p>For BEng Mechanical Engineering with Placement, ME2555 will contribute 8.3% of the overall degree calculation</p>	

Level 7	
<p><b>Compulsory modular block codes, titles and credits</b></p> <p>All assessment blocks are 15 credits unless otherwise specified</p> <p>L7-21 Major Group Project (45) <b>Core: Block</b> The student's input to the major group project topic must be relevant to mechanical engineering.</p> <p>ME5661 Strategy and Business Planning <b>Core: Block</b></p> <p>L7-15 Additive Manufacturing and Advanced CAD</p>	<p><b>Optional modular block codes, titles and credits</b></p> <p>L7-9 Advanced Solid Body Mechanics and FEA</p> <p>L7-10 Advanced Electrical Systems and Power Electronics</p> <p>L7-11 Advanced Thermofluids</p> <p>L7-12 Robotics and Automation</p> <p>L7-16 Principles of Heat Transfer</p> <p>L7-17 Physiological Fluid Mechanics and Disease</p> <p>L7-18 Biomedical Engineering Micro-systems</p> <p>L7-19 Zero Energy Buildings</p> <p>L7-20 Renewable Energy Generation and Storage Systems Design and Economics</p>
<p><b>Level 7 Award Requirements</b></p> <p><a href="#">As per Senate Regulation 2</a> except where the following specific rule applies: Where a student has failed the module L7-21 Major Group Project (45 credits) an exception to Senate Regulation 2 regarding the maximum amount of reassessment at Level 7 is allowed. The student will be permitted up to 45 credits of reassessment which will be applied to module L7-21 Major Group Project only.</p> <p>For MEng Mechanical Engineering with Placement, ME2555 will contribute 5% of the overall degree weighting.</p>	

Please note: this specification provides a concise summary of the main features of the programme and the learning outcomes that a 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 can be found in the modular block, assessment and study block outlines and other programme and block information. The accuracy of the information contained in this document is reviewed by the University from time to time and whenever a modification occurs.