

Title of Programme: BEng (Hons) Mechanical Engineering

Programme Code: **XXXXXX**

For Collaborative: Franchise at Hertfordshire College, Changzhou Institute of Technology, China

Programme Specification

This programme specification is relevant to students entering:
01 September 2024

Associate Dean of School (Academic Quality Assurance):
Mariana Lilley

Signature

A programme specification is a collection of key information about a programme of study (or course). It identifies the aims and learning outcomes of the programme, lists the modules that make up each stage (or year) of the programme, and the teaching, learning and assessment methods used by teaching staff. It also describes the structure of the programme, its progression requirements and any programme-specific regulations. This information is therefore useful to potential students to help them choose the right programme of study, to current students on the programme, and to staff teaching and administering the programme.

Summary of amendments to the programme:

Section	Amendment

If you have any queries regarding the changes, please email AQO@herts.ac.uk

Programme Specification BEng (Hons) Mechanical Engineering

This programme specification (PS) is designed for prospective students, enrolled students, academic staff and potential employers. It provides a concise summary of the main features of the programme and the intended 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 teaching, learning and assessment methods, learning outcomes and content for each module can be found in Definitive Module Documents (DMDs).

Section 1

Awarding Institution/Body	University of Hertfordshire
Teaching Institution	Hertfordshire College, CIT
University/partner campuses	Hertfordshire College CIT
Programme accredited by	Not applicable
Final Qualification	BEng Hons
All Final Award titles (Qualification and Subject)	Mechanical Engineering
FHEQ level of award	6

A. Programme Rationale

The BEng (Hons) in Mechanical Engineering programme, offered by the University of Hertfordshire through its franchise partner, Hertfordshire College, CIT enables students to develop knowledge and skills in a range of topics, such as mechanical design, manufacture, control system, automobile, and motorsport industries.

Furthermore, as China rapidly advances with its industrialisation initiatives, the presence of qualified professionals in Mechanical Engineering becomes crucial, making this programme a timely and valuable option for the China employment context.

Graduates can expect to gain employment within the industries directly associated within the fields of mechanical engineering. Alternatively, graduates may continue their education to a postgraduate level, and the University of Hertfordshire has a range of taught MSc and research awards that graduates may consider.

B. Educational Aims of the Programme

Diversity and Inclusion

Our programmes are purposefully designed to enable all students to engage meaningfully with the curriculum by being accessible and representative. We will support students to shape their learning experience, removing barriers and enabling them to succeed. The curriculum explicitly includes multiple and representative perspectives, valuing collective identities and individual diversity. Learning, teaching and assessment activities help students to understand how they can enhance outcomes both for themselves and for others. All students belong to a learning community, and during their studies we really want to hear their voices, encourage them to listen to others, and express themselves.

The programme has been devised in accordance with the University's graduate attributes of programmes of study as set out in [UPR TL03](#).

Additionally, this programme aims to:

- provide a high-quality education in engineering;
- provide an education for the individual which enhances his/her prospects of professional employment in engineering and business both in national and international industries;

- provide studies which develop an awareness of, and underpinning knowledge and understanding of a broad range of Mechanical Engineering areas of expertise;
- provide studies which enable the student to attain a high level of expertise in a range of topics specific to their named award;
- Mechanical Engineering students will particularly study how to control mechanical systems using analogue and digital electronics.

Graduate Attributes

Our graduates will be capable and professional, creative and enterprising, and will build their social and global awareness throughout. In addition to their subject expertise and proficiency, as a University of Hertfordshire graduate, they will be:

- Professionally focused
- Globally minded
- Sustainability driven
- Digitally capable and confident
- Inclusive and collaborative
- Evidence based and ethical

C. Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills and other attributes in the following areas. The programme outcomes are referenced to the QAA benchmark statements for Engineering and the Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (2014) and relate to the typical student. Additionally, the SEEC Credit Level Descriptors for Further and Higher Education (2021) have been used as a guiding framework for curriculum design.

Knowledge and Understanding	Teaching and learning methods	Assessment strategy
<p>A1- Knowledge and understanding of the scientific principles and methodology underpinning mechanical engineering, and an understanding, to enable appreciation of the scientific and engineering context, and to support their understanding of relevant historical, current and future developments and technologies.</p> <p>A2- Knowledge and understanding of mathematical and statistical methods underpinning mechanical engineering, and to enable the application of a range of mathematical and statistical methods, tools and notations proficiently in the analysis and solution of engineering problems.</p>	<p>Acquisition of knowledge and understanding is through the following approaches:</p> <p>Acquisition of A1 and A2 is through a combination of lectures, small group tutorials, coursework, and laboratory work at levels 4 and 5 of the programme.</p> <p>Additional support is provided through the Academic Support Hubs which includes English Support Service and Mathematics Support Service. Specialist aspects of A2 are further developed at level 6.</p> <p>Acquisition of A3 is through a combination of lectures, projects and coursework throughout the programme.</p> <p>Staff deploy a range of teaching and learning strategies in the most appropriate way for each individual module. This will vary</p>	<p>Knowledge and understanding are assessed through combination of unseen examinations and in-course assessments in the form of laboratory reports, essays, and phase tests. Some aspects of knowledge and understanding are assessed by design exercises and project reports and presentations. At level 6 some aspects of A3 are assessed by case study reports.</p>

<p>A3- Ability to apply and integrate knowledge and understanding of other engineering disciplines to support a study of mechanical engineering.</p>	<p>depending on the subject nature of a particular module and the level of study. A more didactic approach will tend to be adopted at lower levels, in particular for A1 and A2. An increasingly self-directed and interactive approach will be adopted at higher levels, particularly for A3.</p> <p>Throughout, the learner is encouraged to undertake independent study both to supplement and consolidate what is being taught/learnt and to broaden their individual knowledge and understanding of the subject.</p>	
<p>Intellectual skills</p> <p>B1- Understanding of engineering principles and the ability to apply them to analyse of key engineering processes.</p> <p>B2- Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques.</p> <p>B3- Ability to apply quantitative and computational methods in order to solve engineering problems and implement appropriate action.</p> <p>B4- Understanding of, and the ability to apply, an integrated or systems approach to solving engineering problems.</p>	<p>Teaching and learning methods</p> <p>Engineering analysis skills are developed throughout the programme by the methods and strategies outlined for section A of the intended learning outcomes above, again moving from a more didactic approach to an increasingly self-directed and interactive approach at higher levels, particularly for B2, B3 and B4.</p> <p>Analysis, problem solving and modelling skills are further developed through tutorial work, laboratory work, in-course exercises and project work.</p> <p>Throughout, the learner is encouraged to develop intellectual skills further by independent study.</p>	<p>Assessment strategy</p> <p>Engineering analysis skills B1, B2 and B4 are assessed through unseen examination papers, laboratory reports and coursework related to in-course exercises.</p> <p>Engineering analysis skills B3 are assessed through project reports and presentations.</p>
<p>Practical skills</p> <p>C1- Understand and evaluate business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics.</p>	<p>Teaching and learning methods</p> <p>Practical skills for design are developed throughout the programme by the methods and strategies outlined above, again moving from a more didactic approach to an increasingly self-directed and interactive approach</p>	<p>Assessment strategy</p> <p>Practical skills C1, C2, C5 and C6 are assessed through unseen examination, coursework, project reports, technical reports and oral presentations.</p>

<p>C2- 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.</p> <p>C3- Work with information that may be incomplete or uncertain, and quantify the effect of this on the design.</p> <p>C4- 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 and disposal.</p> <p>C5- Plan and manage the design process, including cost drivers, and evaluate outcomes.</p> <p>C6- Communicate their work to technical and non-technical audiences.</p>	<p>at higher levels, particularly for C3 and C4.</p> <p>Feedback is given to all students on all coursework produced.</p> <p>Throughout, the learner is encouraged to develop practical skills further by independent study.</p>	<p>C3, C4 is assessed by review of group project work.</p>
<p>Knowledge and Understanding (Economic, Legal, Social, Ethical & Environmental Context)</p>	<p>Teaching and learning methods</p>	<p>Assessment strategy</p>
<p>D1- Understanding of the need for a high level of professional and ethical production in engineering and a knowledge of professional codes of conduct.</p> <p>D2- Knowledge and understanding of the commercial, economic, and social context of engineering processes.</p> <p>D3- Knowledge and understanding of management techniques, including project management, that may be used to achieve engineering objectives.</p>	<p>The economic, legal, social, ethical, and environmental context of the role of engineers is developed in a series of project-based exercises through the programme and reinforced by a taught module at the start of the programme.</p> <p>Throughout, the learner is encouraged to develop transferable skills by maintaining a record of evidence and completing a personal development plan.</p>	<p>Transferable skills A4 to A9 are assessed by coursework, project reports, technical reports, and presentations.</p>

<p>D4- Understanding of the requirement for engineering activities to promote sustainable development and ability to apply quantitative techniques where appropriate.</p> <p>D5- Awareness of the relevant legal requirements governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and liability issues.</p> <p>D6- Knowledge and understanding of risk issues, including health and safety, environmental and commercial risk, risk assessment and risk management techniques.</p>		
Engineering Practice	Teaching and learning methods	Assessment strategy
<p>E1- Understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, application and development of technology, etc.)</p> <p>E2- Knowledge of characteristics of particular materials, equipment, processes or products.</p> <p>E3- Ability to apply relevant practical and laboratory skills.</p> <p>E4- Understanding use of technical literature and other information sources.</p> <p>E5- Knowledge of relevant legal and contractual issues.</p> <p>E6- Understanding of appropriate codes of practice and industry standards.</p> <p>E7- Awareness of quality issues and their application to continuous improvement.</p> <p>E8- Ability to work with technical uncertainty.</p>	<p>Staff deploy a range of teaching and learning strategies in the most appropriate way for each individual module. This will vary depending on the subject nature of a particular module and the level of study. A more didactic approach will tend to be adopted at lower levels, in particular for E1, E2, E3, E4 and E9.</p> <p>Acquisition of skills for E5, E6 and E7 are through a combination of formal lectures and tutorials, as well as project-based work.</p> <p>An increasingly self-directed and interactive approach will be adopted at higher levels, particularly for E6, E7 and E8.</p>	<p>Engineering practice is assessed through combination of unseen examinations and in-course assessments.</p> <p>Assessments take many forms as appropriate, and include laboratory reports, demonstrations, essays, and phase tests.</p>

E9- Understanding of, and the ability to work in, different roles within an engineering team.		
Transferable skills	Teaching and learning methods	Assessment strategy
<p>F1- Apply their skills in problem solving, communication, information retrieval, working with others and the effective use of general IT facilities.</p> <p>F2- Plan self-learning and improve performance, as the foundation for lifelong learning/CPD.</p> <p>F3- Plan and carry out a personal programme of work, adjusting where appropriate.</p> <p>F4- Exercise initiative and personal responsibility, which may be as a team member or leader.</p>	<p>Transferable skills are developed throughout the programme by the methods and strategies outlined in above.</p> <p>F1 is developed through feedback on coursework reports, oral presentations, and project reports.</p> <p>F2 is developed in a dedicated module that emphasises the role of such practice.</p> <p>F3 is developed through project work planning and throughout the programme.</p> <p>F4 is developed through group project and assignment work.</p> <p>Throughout, the learner is encouraged to develop transferable skills by maintaining a record of evidence and completing a personal development plan.</p>	<p>Transferable skills are assessed through the following approaches:</p> <p>F1 and F2 are assessed through coursework, individual project and technical reports and oral presentations.</p> <p>F3 and F4 are assessed by review of an individual's progress during individual project work.</p>

D. Programme Structures, Features, Levels, Modules, and Credits

The programme is offered in full-time (3 years) modes, and leads to the award of a BEng degree with Honours in Mechanical Engineering. Intake is normally A(September).

Professional and Statutory Regulatory Bodies

N/A

Work-Based Learning, including Sandwich Programmes

N/A

Student Exchange programme Incoming Exchange

N/A

Study Abroad

N/A

Programme Structure

The programme structure and progression information below (Table 1a and 1b) are provided for the Honours award. Any interim awards are identified in Table 1b. The Programme Learning Outcomes detailed above are developed and assessed through the constituent modules. Table 2 identifies where each learning outcome is assessed.

Table 1a Outline Programme Structure

Mode of study: Full Time

Entry point: Semester A (September)

Level 4

Compulsory Modules Module Title	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Engineering Fundamentals	4FTC2144	15	0	0	100	0	A
Engineering Mathematics	4FTC2145	15	40	60	0	0	A
Statics and Dynamics	4FTC2146	15	60	0	40	0	A
Applied Design	4FTC2147	15	0	0	100	0	A
Electrical Science	4FTC2148	15	30	0	70	0	B
Programming for Engineers	4FTC2149	15	40	0	0	60	B
Engineering Professionalism	4FTC2150	15	0	0	100	0	B
Introduction to Mechatronic Systems	4FTC2151	15	0	0	100	0	B

Progression to level 5 requires a minimum of 90 credits. The maximum study rate in such an instance would be 150 credits and students would be expected to redeem any failed modules at the first available opportunity.

Level 5

Compulsory Modules Module Title	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Fluid Mechanics	5FTC2184	15	20	60	20	0	A
Thermodynamics	5FTC2185	15	75	0	25	0	A
Materials in Engineering	5FTC2186	15	0	60	40	0	A
Sustainable Design	5FTC2187	15	0	0	100	0	A
Dynamics and Vibrations	5FTC2188	15	80	0	20	0	B
Structural Mechanics	5FTC2189	15	80	0	20	0	B
Introduction and Applications of Control Systems	5FTC2190	15	0	0	100	0	B
Industrial Mechanics	5FTC2191	15	0	0	100	0	B

Progression to level 6 requires 210 credits, including 90 credits at level 5. The maximum study rate in such an instance would be 150 credits and students would be expected to redeem any failed modules at the first available opportunity.

Level 6

Module Title	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Lean Manufacturing and Supply Chains	6FTC2195	15	0	0	60	40	A
Advanced Mechanics	6FTC2194	15	0	60	40	0	A
Analysis of Applied Control Systems	6FTC2197	15	0	0	100	0	A
Advanced Controller Design and Stability	6FTC2196	15	0	0	100	0	B
Acoustics	6FTC2192	15	20	60	20	0	B
Renewable Energy and the Environment	6FTC2193	15	60	0	40	0	B
BEng Individual Project (Mechanical)	6FTC2198	30	0	0	80	20	AB

The award of an Honours degree in Robotics and Artificial Intelligence requires 360 credit points including 240 at level 6/5 of which 120 must be at level 6.

Honours classification

The University has approved structure and assessment regulations common to all programmes. Full details are provided in [UPR AS14](#), Section D. However, this programme has specific regulations relating to the determination of Honours classification given under the Programme-Specific Regulations at the end of Section D.

Table 1b Final and interim awards available

The programme provides the following final and interim awards:

Final Award	Award Title	Minimum requirements	Available at end of Level	Programme Learning Outcomes developed (see above)
BEng (Hons)	Mechanical Engineering	360 credit points including 240 at level 6/5 of which 120 must be at level 6	6	All programme learning outcomes (see Table 2)
Interim Award	Award Title	Minimum requirements	Available at end of Level	Programme Learning Outcomes developed (see above)
University Certificate		45 credit points at level 4	4	See UPR AS11, section 13: http://sitem.herts.ac.uk/secreg/upr/AS11.htm
Certificate of Higher Education		120 credit points at level 4	4, 5	See UPR AS11, section 13: http://sitem.herts.ac.uk/secreg/upr/AS11.htm
Diploma of Higher Education		240 credit points including at least 120 at level 5	5, 6	See UPR AS11, section 13: http://sitem.herts.ac.uk/secreg/upr/AS11.htm
BEng	Mechanical Engineering	300 credit points including 180 at level 6/5 of which 60 must be at level 6	6	A subset of programme learning outcomes for the award (see Table 2), depending on modules passed.

Programme-specific assessment regulations

The programme complies with the University's academic regulations (in particular, [UPR AS11](#), [UPR AS13](#) and [UPR AS14](#)) with the exception of those listed below, which have been approved by the University:

- Students exiting with a BEng (Hons) award shall have their degree classification determined in accordance with [UPR AS14](#) and include the individual project in the calculation of degree.

Course Code	Course Instance	Award Title	Modules (child instance codes & title)	Must be included in classification algorithm?
XXXXX	XXXXX	BEng (Hons) Mechanical Engineering	BEng Individual Project (Mechanical) 6FTC2198	yes

- Additionally, students who are offered a re-enrolment opportunity on BEng Individual Project (Mechanical) 6FTC2198, will normally be allocated an entirely different project in their repeat opportunity.

E. Management of Programme & Support for student learning.

Management

The programme is managed and administered through:

- Dean of Hertfordshire College, CIT.
- UH Executive Dean.
- UH SPECS International Franchise Manager.
- Associate Dean (AQA, Learning and Teaching) of Hertfordshire College, CIT.
- Associate Dean (Student Experience) of Hertfordshire College, CIT.
- The Programme Leader at Hertfordshire College, CIT who has overall responsibility for the effective operationalisation of the programme, ensuring that academic standards are maintained, and an effective student learning experience is provided. The Programme Leader is also responsible for chairing the programme committee.
- A Collaborative Partnership Leader, based at UH, to provide support and facilitate communication between UH and Hertfordshire College, CIT.
- Module leaders at Hertfordshire College, CIT who are responsible for individual modules.
- A Programme committee that includes the above key stakeholders and student representatives.
- An Admissions Tutor at Hertfordshire College, CIT with specific responsibility for admissions and open days, where necessary, liaise with UH CPL and/or admissions tutor regarding special admissions cases.
- A designated administrative team to deal with day-to-day administration associated with the modules within the programme.

Support

Students are supported by:

- An induction week at the beginning of each new academic session.
- A Programme Handbook which provides information about the programme, the support services available and the calendar of events for the year.
- A Student Development Centre that provides advice on issues such as finance, accommodation, University regulations, study abroad, etc.
- A Student Support Hub which includes full-time Personal Tutor(s) and Assistant Programme Leader(s) who will be an important point of contact. Personal Tutor(s) can provide advice on non-academic issues, Assistant Programme Leader(s) can provide one-on-one guidance on academic issues.
- A versatile on-line inter-active intranet and learning environment.
- Guided student-centred learning on Canvas module sites.
- Access to extensive digital and print collections of information resources.
- Attractive modern study environment in library.
- An Academic Support Hub which includes academic English support, Maths support, computer programming support, technical writing support.
- Technical support staff and access to computer and technical laboratories.
- Programme Leader who can advise on programme issues.
- Module teaching teams who provide academic support.
- A project supervisor.
- A Careers and Employment Office that supports students looking for graduate employment.
- A Special-needs Support Office that assists students with various special needs.
- Medical Centre.
- Mental Health Advisory Support Office.
- Changzhou Institute of Technology Student's Union.
- Dedicated programme site.

F. Other sources of information

In addition to this Programme Specification, Hertfordshire College, CIT publishes guidance to registered students on the programme and its constituent modules:

- A dedicated programme site;
- A Definitive Module Document (DMD) for each constituent module;

The Programme Handbook provides information on a wide range of resources and services available at the Hertfordshire College, CIT including academic support, accommodation, fees, funding, wellbeing services and student societies.

As a condition of registration, all students of the University of Hertfordshire are required to comply with the University's rules, regulations and procedures. These are published in a series of documents called 'University Policies and Regulations' (UPRs). The University requires that all students consult these documents which are available on-line, on the UPR web site, at: <http://www.herts.ac.uk/secreg/upr/>. In particular, [UPR SA07](#) 'Regulations and Advice for Students' Particular Attention - Index' provides information on the UPRs that contain the academic regulations of particular relevance for undergraduate and taught postgraduate students.

In accordance with section 4(5) of the Higher Education and Research Act 2017 (HERA), the UK Office for Students (OfS) has registered the University of Hertfordshire in the register of English higher education providers. The Register can be viewed at: <https://www.officeforstudents.org.uk/advice-and-guidance/the-register/the-ofs-register/>.

G. Entry requirements

The normal entry requirements for the programme are:

Level 4 Entry:

- Applicants should have passed the minimum control line for undergraduates on the National College Entrance Examination (NCEE), which must include Mathematics and Physics.

Plus:

- Demonstrate a proficiency in English to IELTS 6.0 with minimum 5.5 in each band or an equivalent recognised qualification (including pass the Pre-Sessional English course).

Entry is only at level 4.

If you would like this information in an alternative format please contact:
cpuadmin@herts.ac.uk

If you wish to receive a copy of the latest External Examiner's Report for the programme, please email a request to aqo@herts.ac.uk

BEng (Hons) Mechanical Engineering

Table 2: Development of Intended Programme Learning Outcomes in the Constituent Modules

This map identifies where the programme learning outcomes are delivered and assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

		Programme Learning Outcomes (as identified in section 1 and the following page)																																	
		Knowledge & Understanding										Intellectual Skills				Practical Skills													Transferable Skills						
Module Title		Module Code	A1	A2	A3	D1	D2	D3	D4	D5	D6	B1	B2	B3	B4	C1	C2	C3	C4	C5	C6	E1	E2	E3	E4	E5	E6	E7	E8	E9	F1	F2	F3	F4	
Level 4	Engineering Mathematics	4FTC2145		X									X											X											
	Statics and Dynamics	4FTC2146										X	X	X										X											
	Engineering Fundamentals	4FTC2144	X			X																		X											
	Applied Design	4FTC2147									X				X									X								X	X		
	Electrical Science	4FTC2148	X		X				X			X	X										X	X								X			
	Programming for Engineers	4FTC2149													X									X							X				
	Engineering Professionalism	4FTC2150				X	X	X	X	X												X				X	X	X		X	X	X			
Level 5	Introduction to Mechatronic Systems	4FTC2151			X		X	X			X	X		X	X	X	X	X	X	X	X	X	X	X					X						
	Fluid Mechanics	5FTC2184	X									X	X																						
	Thermodynamics	5FTC2185	X									X	X																						
	Materials in Engineering	5FTC2186										X											X							X					
	Sustainable Design	5FTC2187			X		X	X			X	X		X	X	X	X	X	X	X	X	X	X	X					X		X				
	Dynamics & Vibrations	5FTC2188	X									X	X											X											
	Structural Mechanics	5FTC2189										X	X	X																					
Level 6	Introduction and Application of Control Systems	5FTC2190		X							X	X	X																X						
	Industrial Mechanics	5FTC2191			X		X	X			X	X		X	X	X	X	X	X	X	X	X	X	X					X		X				
	Lean Manufacturing and Supply Chains	6FTC2195					X	X															X				X	X							
	Advanced Mechanics	6FTC2194											X	X	X																				
	Advanced Controller Design and Stability	6FTC2196		X									X	X																					
	Analysis of Applied Control Systems	6FTC2197										X	X	X	X									X											
	Acoustics	6FTC2192	X		X																														
Renewable Energy and the Environment	6FTC2193	X	X	X												X																			
Individual Project (BEng Mechanical)	6FTC2198	X			X	X	X	X	X	X				X	X			X						X				X		X		X	X		

KEY TO PROGRAMME LEARNING OUTCOMES

Knowledge and Understanding

- A1. Knowledge and understanding of the scientific principles and methodology underpinning mechanical engineering, and an understanding, to enable appreciation of the scientific and engineering context, and to support their understanding of relevant historical, current, and future developments and technologies.
- A2. Knowledge and understanding of mathematical and statistical methods underpinning mechanical engineering, and to enable the application of a range of mathematical and statistical 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 a study of mechanical engineering.

Intellectual Skills

- B1. Understanding of engineering principles and the ability to apply them to analyse of 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 and computational methods in order to solve engineering problems and implement appropriate action.
- B4. Understanding of, and the ability to apply, an integrated or systems approach to solving engineering problems.

Practical Skills

- C1. Understand and evaluate business, customer, and user needs, including considerations such as the wider engineering context, public perception and aesthetics.
- C2. 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.
- C3. Work with information that may be incomplete or uncertain and quantify the effect of this on the design.
- C4. 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, and disposal.
- C5. Plan and manage the design process, including cost drivers, and evaluate outcomes.
- C6. Communicate their work to technical and non-technical audiences.

Economic, Legal, Social, Ethical and Environmental

- D1. Apply their skills in problem solving, communication, information retrieval, working with others and the effective use of general IT facilities.
- D2. Plan self-learning and improve performance, as the foundation for lifelong learning/CPD.
- D3. Plan and carry out a personal programme of work, adjusting where appropriate.
- D4. Exercise initiative and personal responsibility, which may be as a team member or leader.
- D5. Awareness of the relevant legal requirements governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and liability issues.

D6. Knowledge and understanding of risk issues, including health and safety, environmental and commercial risk, risk assessment and risk management techniques.

Engineering Practice

- E1. Understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, application, and development of technology, etc.)
- E2. Knowledge of characteristics of particular materials, equipment, processes or products.
- E3. Ability to apply relevant practical and laboratory skills.
- E4. Understanding use of technical literature and other information sources.
- E5. Knowledge of relevant legal and contractual issues.
- E6. Understanding of appropriate codes of practice and industry standards.
- E7. Awareness of quality issues and their application to continuous improvement.
- E8. Ability to work with technical uncertainty.
- E9. Understanding of, and the ability to work in, different roles within an engineering team.

Transferrable Skills

- F1. Apply their skills in problem solving, communication, information retrieval, working with others and the effective use of general IT facilities.
- F2. Plan self-learning and improve performance, as the foundation for lifelong learning/CPD.
- F3. Plan and carry out a personal programme of work, adjusting where appropriate.
- F4. Exercise initiative and personal responsibility, which may be as a team member or leader.

Table 3: Development of Graduate Attributes in the Constituent Modules

This map identifies where the Graduate Attributes are delivered in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the development of the Graduate Attributes (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own personal and professional development as the programme progresses. [Note that there is no requirement for the Graduate Attributes to be assessed through these modules]

D = Delivered

	Module Title	Module Code	Professionally Focused	Globally Minded	Sustainability Driven	Digitally capable & confident	Inclusive and collaborative	Evidenced based and Ethical
Level 4	Engineering Fundamentals	4FTC2144	D					D
	Engineering Mathematics	4FTC2145	D					D
	Statics and Dynamics	4FTC2146	D					D
	Applied Design	4FTC2147	D	D			D	
	Electrical Science	4FTC2148	D		D			D
	Programming for Engineers	4FTC2149		D		D		D
	Engineering Professionalism	4FTC2150	D	D	D		D	D
	Introduction to Mechatronic Systems	4FTC2151		D		D	D	
Level 5	Fluid Mechanics	5FTC2184	D		D			D
	Thermodynamics	5FTC2185	D		D			D
	Materials in Engineering	5FTC2186			D			D
	Sustainable Design	5FTC2187	D	D	D	D	D	
	Dynamics and Vibrations	5FTC2188	D					D
	Structural Mechanics	5FTC2189	D					D
	Introduction and Applications of Control Systems	5FTC2190				D		D
	Industrial Mechanics	5FTC2191	D	D		D	D	
Level 6	Lean Manufacturing and Supply Chains	6FTC2195	D	D		D	D	
	Advanced Mechanics	6FTC2194	D					D
	Acoustics	6FTC2192	D					D
	Renewable Energy and the Environment	6FTC2193	D	D	D			D
	Advanced Controller Design and Stability	6FTC2196	D					D
	Analysis of Applied Control Systems	6FTC2197	D			D		D
	BEng Individual Project	6FTC2198	D	D	D	D		D

Section 2

Programme management

Relevant QAA subject benchmarking statements	Mechanical Engineering
Type of programme	Undergraduate
Date of validation/last periodic review	April 24
Date of production/ last revision of PS	February 2024
Relevant to level/cohort	Level 4 entering September 2024
Administrative School	School of Physics, Engineering & Computer Science
Language of Delivery	English

Table 4 Course structure

Course details			
Course Code	Course Description	HECOS	UCAS
XXXXXXX	BEng (Hons) Mechanical Engineering	100190	N/A