

Title of Programme: Engineering Degree Apprenticeship (Mechanical)

Programme Code: PEDAMECH

# Programme Specification

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

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



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.

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**Summary of amendments to the programme:**

Section	Amendment

If you have any queries regarding the changes please email [AQO@herts.ac.uk](mailto:AQO@herts.ac.uk)

# Programme Specification

## Engineering Degree Apprenticeship (Mechanical)

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

<b>Awarding Institution/Body</b>	University of Hertfordshire
<b>Teaching Institution</b>	University of Hertfordshire
<b>University/partner campuses</b>	College Lane
<b>Programme accredited by</b>	
<b>Final Qualification</b>	BEng Honours
<b>All Final Award titles</b>	Mechanical Engineering (Work Based)
<b>(Qualification and Subject)</b>	
<b>FHEQ level of award</b>	6

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### A. Programme Rationale

Mechanical Engineers use engineering techniques to bring new products to life or redesign existing products. This occupation uses the ability to plan and lead projects that provide critical analysis, continuous improvement and problem solving to support research, design and development activities. Working in a team to understand customer or stakeholder requirements, consider legal implications and ensure conformity to legislation, and standards. The key processes utilise Computer Aided Design (CAD) and Computer Aided Engineering (CAE) software and subsequent simulated and real-life testing to validate that the product meets customers' needs and conforms to technical specification. Responsibilities in this occupation include design, development and optimisation of mechanical systems, product performance, equipment integration for reliability and compliance of systems to specification or better. Cost saving opportunities, environmentally sustainable, recycling, and reusability are all targets.

In this programme apprentices will study the BEng Honours in Mechanical Engineering at the University of Hertfordshire alongside developing their professional behavioural skills and knowledge to satisfy the requirements for the Manufacturing Engineer Apprenticeship Standard. This will be achieved through a combination of industrial experience opportunities provided by the employer and academic studies led by UH staff with a wealth of industrial and research experience.

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### B. Educational Aims of the Programme

The programme adheres to and supports the associated EPA Plan and is aligned with the QAA Subject Benchmark Statement for Engineering (2023) and the requirements for the Accreditation of Higher Education Programmes (AHEP) in engineering, in line with the UK Standard for Professional Engineering Competence (UK-SPEC). Apprentices, who are engaged in a minimum of 30 hours of professional employment per week, benefit from structured learning in the workplace, supported by both the university and their employer.

The teaching in this programme is informed by the research strengths of the Department of Engineering, as well as its longstanding relationships with business and industry through activities such as Knowledge

Transfer Partnerships (KTPs) and its Professional Advisory Boards. The programme also builds upon its campus-based BEng (Hons) Mechanical Engineering programme, which is a well-established and highly popular degree course.

### **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.

In addition to academic development, the programme recognises the importance of developing apprentices' professional and civic character, as articulated through the University's Graduate Attributes. 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 Mechanical Engineering.

### **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

### **British Values, Safeguarding and Prevent**

The University of Hertfordshire wants to ensure that all our students and apprentices are responsible members of society who treat others with respect and tolerance, regardless of background, and promotes an understanding British value. These are values that shape our society and are protected by law, through legislation including the Equality Act of 2010.

British Values include:

- Democracy
- The rule of law
- Individual liberty
- Mutual respect and tolerance for those of different faiths and beliefs

The programme is expected to address the above values and to ensure they are at the core of any teaching & learning activity and are recognised as central to the development of each and all KSBs, as expected by the standard.

As per any other programme offered by the University of Hertfordshire, safeguarding is pursued consistently and regulated by a number of UPRs (e.g., EQ10, HS10, all available from UPR TL03). Programme staff will

actively engage with apprentices and employers to ensure the above activities and principles are consistently pursued also with on-the-job learning.

### 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 defined by the Engineering Council and recommended in the QAA benchmark statements for Engineering (2023) and the Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (2024) 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. In addition, the SEEC Credit Level Descriptors for Higher Education (2021) have been used to provide guidance for curriculum design at each level of the programme to reflect student development. The curriculum design has also taken into account UH Graduate Attributes.

	<b>Knowledge and understanding</b>	<b>Teaching and learning methods</b>	<b>Assessment strategy</b>
A1	Demonstrate knowledge and understanding of the scientific principles and methodology underpinning mechanical engineering, to enable appreciation of the scientific and engineering context, and to support their understanding of relevant historical, current and future developments and technologies. (SM1b)	Acquisition of knowledge and understanding is developed partly through academic studies and partly through the workplace activities. Knowledge, understanding and intellectual skills are taught at the University with apprentices putting them into context and appreciating their relevance through applying them at work.	Knowledge and understanding will be assessed through combination of unseen examinations and in-course assessments in the form of laboratory reports, essays, critical analysis, and in-class tests.
A2	Demonstrate 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. (SM2b)	Acquisition of A1, A2 and A3 is through a combination of lectures, projects, tutorials, coursework and laboratory work at levels 4 and 5 of the programme. Additional support is provided through the School Academic Support Hub (SASH). Specialist aspects of A2 and A3 are further developed at level 6.	Some aspects of knowledge and understanding are assessed by design exercises and project reports, demonstrations and presentations. At level 6 some aspects of A3 are assessed by case study analysis reports.
A3	Be able to apply and integrate knowledge and understanding of other engineering disciplines to support a study of mechanical engineering. (SM3b)	Staff deploy a range of teaching and learning strategies in the most appropriate way for each module. This will vary depending on the subject nature 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.  In particular, Work-Based Learning (WBL) is deployed within many of the modules,	Assessments will also include work-based projects or other assignments, drawing on knowledge of and experience in the workplace as appropriate.  Assessments can also include more substantial elements of teamwork, combined with elements of project work, exposing apprentices to team work and integrative assessment tasks. At all levels, where appropriate,

		typically as work-based projects or other-directed assignments.  Throughout, the apprentice 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.	assessments will also include a component of peer assessment by apprentices.  The individual project, as lays a major role in assessing knowledge and understanding of apprentices against the occupational standard.
	<b>Intellectual skills</b>	<b>Teaching and learning methods</b>	<b>Assessment strategy</b>
B1	Demonstrate understanding of engineering principles and the ability to apply them to analyse of key engineering processes. (EA1b)	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.  Analysis, problem solving and modelling skills are further developed through tutorial work, laboratory work, in-course exercises, and project work.  Throughout, the learner is encouraged to develop intellectual skills further by independent study.	Engineering analysis skills B1, B2 and B4 are assessed through unseen examination papers, laboratory reports and coursework related to in-course exercises.  Engineering application competencies B3 and B4 are assessed through project reports, demonstrations and presentations, drawing on knowledge and experience in the workplace where appropriate.
B2	Be able to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques. (EA2)		
B3	Be able to apply quantitative and computational methods in order to solve engineering problems and implement appropriate action. (EA3b)		
B4	Demonstrate understanding of, and the ability to apply, an integrated or systems approach to solving engineering problems. (EA4b)		
B5	Demonstrate understanding of and be able to evaluate business, customer, and user needs, including considerations such as the wider engineering context, public perception and aesthetics. (D1)	Intellectual 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 at higher levels, particularly for C3 and C4.  Feedback is given to all students on all coursework produced.  Throughout, the apprentice is encouraged to develop intellectual skills further by independent study.  Project work offering the opportunity to practise the skills in a supportive environment. In	C1, C2, C5 and C6 are assessed through unseen examination, coursework, project reports, technical reports and oral presentations.  C3, C4 is assessed by review of group project work.
B6	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. (D2)		
B7	Work with information that may be incomplete or uncertain and quantify the effect of this on the design. (D3b)		

B8	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. (D4)	some cases, particular at levels 5 and 6, practical work may be undertaken in the workplace.	
B9	Plan and manage the design process, including cost drivers, and evaluate outcomes. (D5)		
B10	Communicate their work to technical and non-technical audiences. (D6)		
B11	Demonstrate understanding and need for a high level of professional and ethical production in engineering and a knowledge of professional codes of conduct. (EL1b)	<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 and in the final year project.</p> <p>Apprentices are encouraged to drawing on knowledge and experience in the workplace to further develop this knowledge.</p>	D1 to D6 are assessed by coursework, project reports, technical reports and presentations.
B12	Demonstrate knowledge and understanding of the commercial, economic, and social context of engineering processes. (EL2)		
B13	Demonstrate knowledge and understanding of management techniques, including project management that may be used to achieve engineering objectives. (EL3b)		
B14	Demonstrate understanding of the requirement for engineering activities to promote sustainable development and ability to apply quantitative techniques where appropriate. (EL4)		
B15	Demonstrate awareness of the relevant legal requirements governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and liability issues. (EL5b)		
B16	Demonstrate knowledge and understanding of risk issues, including health and safety, environmental and commercial risk, risk assessment and risk management techniques. (EL6b)		

	<b>Practical Skills</b>	<b>Teaching and learning methods</b>	<b>Assessment strategy</b>
C1	Demonstrate understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, application and development of technology, etc.) (P1)	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.	Engineering practice is assessed through combination of unseen examinations and in-course assessments.
C2	Demonstrate knowledge of characteristics of particular materials, equipment, processes or products. (P2b)		Assessments take many forms as appropriate, and include laboratory reports, demonstrations, essays, and phase tests.
C3	Be able to apply relevant practical and laboratory skills. (P3)	Acquisition of skills for E5, E6 and E7 are through a combination of formal lectures and tutorials, as well as project-based work. In some cases, particularly at levels 5 and 6, practical work may be undertaken in the workplace.	
C4	Be able to use locate and use technical literature and other information sources to support critical analysis. (P4)		
C5	Demonstrate knowledge of relevant legal and contractual issues. (P5)	An increasingly self-directed and interactive approach will be adopted at higher levels, particularly for E6, E7 and E8.	
C6	Demonstrate understanding of appropriate codes of practice and industry standards relevant to engineering. (P6)	Apprentices will also be expected to draw on knowledge and experience in the workplace to further develop their skills in engineering practice.	
C7	Demonstrate understanding of quality issues and their application to continuous improvement. (P7)		
C8	Be able to work with technical uncertainty. (P8)		
C9	Be able to work in engineering teams. (P11b)		

	<b>Transferable skills</b>	<b>Teaching and learning methods</b>	<b>Assessment strategy</b>
D1	Apply problem solving, communication, information retrieval skills when working with others and demonstrating the effective use of general IT facilities.	Additional general skills are developed throughout the programme by the methods and strategies outlined in above.	Additional general skills are assessed through the following approaches:
D2	Plan self-learning to improve performance, as the foundation for lifelong learning/CPD. (G2)	F1 is developed through feedback on coursework reports, oral presentations and project reports. F2 and F3 are developed in a dedicated module like final year project that emphasises the role of such practice. F3 is developed through project work planning and throughout the programme.	F1, and F2 are assessed through coursework, individual project and technical reports and oral presentations. F3 and F4 are assessed by review of an individual's progress during individual project work.
D3	Plan and carry out a personal programme of work, adjusting where appropriate. (G3b)		
D4	Exercise initiative and personal responsibility, which may be as a team member or leader. (G4)  NB: Typically, the principles of transferable skills are taught indirectly during academic study at the University with students developing proficiency through experience at work.	F4 is developed through group projects and assignment work.  Throughout, the learner is encouraged to develop transferable skills in the workplace and by maintaining a record of evidence and completing a personal development plan.	

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

The programme is offered in full-time mode and leads to the award of a BEng Degree with Honours in Mechanical Engineering (Work Based).

Entry is normally in Semester A at level 4 but is possible to join the programme at level 5 with suitable qualifications.

#### **Professional and Statutory Regulatory Bodies**

Accreditation with the Institute of Mechanical Engineers (IMechE) will be sought.

#### **Work-Based Learning**

As part of the degree apprenticeship, apprentices are expected to actively apply the skills and knowledge gained in the workplace to their university coursework, assessments and projects, and additionally, apply academic learnings to practical situations in their jobs. The programme of study offers opportunities through case studies and tasks supported by each apprentice's workplace and integrates these examples so that all apprentices can learn from them within the teaching environment. To support this process, each apprentice will be assigned an Employer Mentor (EM) by their employer and an Employer Liaison Tutor (ELT) by the Department of Engineering. The Employer Mentor, in consultation with the Employer Liaison Tutor, will develop an Individual Learner Plan (ILP) tailored to meet the knowledge, skills, and behaviours outlined in the apprenticeship standard. Both the Employer Mentor and the Employer Liaison Tutor will monitor progress through the ILP. Additionally, apprentices are required to maintain an e-portfolio of documentary evidence demonstrating their achievements, which is necessary for the end-point assessment.



## End Point Assessment

After the completion of the BEng Honours in Mechanical Engineering (Work Based), apprentices are required to take the End Point Assessment against the Manufacturing Degree Apprenticeship End Point Assessment Plan to complete their apprenticeship.

## Programme Structure

The programme structure and progression information below (Table 1a and 1b) is 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

**Level 4 (Year 1)**

Module Title	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Engineering Fundamentals (Apprenticeship) (*)	4ENT2085	15	0	0	100	0	A
Engineering Mathematics (Apprenticeship)	4ENT2086	15	40	60	0	0	A
Statics and Dynamics (Apprenticeship)	4ENT2075	15	60	0	40	0	A
Electrical Science (Apprenticeship)	4ENT2087	15	30	0	70	0	B
Programming for Engineers (Apprenticeship)	4ENT2076	15	40	0	0	60	B
Engineering Professionalism (Apprenticeship) (*)	4ENT2088	15	0	0	100	0	B

(\*) These modules will be delivered in using two intensive weeks (block delivery).

Progression to Year 2 typically requires 90 credits.

**Mode of study** Full-time  
**Level 4/5 (Year 2)**

Module Titles	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Applied Design (Apprenticeship) (*)	4ENT2089	15	0	0	100	0	A
Fluid Mechanics (Apprenticeship)	5ENT2081	15	20	60	20	0	A
Materials in Engineering (Apprenticeship)	5ENT2075	15	0	60	40	0	A
Introduction to Mechatronic Systems (Apprenticeship) (*)	4ENT2090	15	0	0	100	0	B
Dynamics & Vibration (Apprenticeship)	5ENT2082	15	80	0	20	0	B
Structural Mechanics (Apprenticeship)	5ENT2083	15	80	0	20	0	B

(\*) These modules will be delivered in using two intensive weeks (block delivery).

Progression to Year 3 typically requires 180 credits.

**Mode of study** Full-time  
**Level 5/6 (Year 3)**

Module Titles	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Sustainable Design (Apprenticeship) (*)	5ENT2084	15	0	0	100	0	A
Thermodynamics (Apprenticeship)	5ENT2074	15	75	0	25	0	A
Advanced Mechanics (Apprenticeship)	6ENT2074	15	0	60	40	0	A
Industrial Mechanics (Apprenticeship) (*)	5ENT2085	15	0	0	100	0	B
Introduction & Application of Control Systems (Apprenticeship)	5ENT2076	15	0	0	100	0	B
Acoustics (Apprenticeship)	6ENT2076	15	20	60	20	0	B

(\*) These modules will be delivered in using two intensive weeks (block delivery).

Progression to Year 4 typically requires 270 credits.

**Mode of study** Full-time  
**Level 6 (Year 4)**

Module Titles	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Lean Manufacturing and Supply Chains (Apprenticeship)	6ENT2077	15	0	0	60	40	A
Engineering Operations and Project Management (Apprenticeship)	6ENT2078	15	0	0	100	0	A
Renewable Energy & Environment (Apprenticeship)	6ENT2079	15	60	0	40	0	B
Product Improvement and Quality Management (Apprenticeship)	6ENT2080	15	0	0	100	0	B
BEng Individual Project (Mechanical) (Apprenticeship) (*) (**)	6ENT2081	30	0	0	80	20	AB

(\*) These modules will be delivered in using two intensive weeks (block delivery). For the project module, degree apprentices will be expected to use the block weeks to work on their project.

(\*\*) The Individual Project will be employer-based.

The award of an Honours degree requires 360 credit points passed with a minimum of at least 120 at level 6 including the BEng Individual Project (Mechanical) 6ENT2047.

**Should an apprentice have insufficient credits to progress to the next year of study, a bespoke study pattern will be designed in collaboration with the apprentice, the employer, and the programme leader to support the apprentice to progress on the degree apprenticeship. In line with UPR AS14 D3.6, undergraduate apprentices cannot undertake further study at higher levels on the same programme of study if they have more than 60 credit points of failure outstanding from previous levels.**

### Honours classification

The University has approved structure and assessment regulations common to all programmes. Full details are provided in [UPR AS14](#), 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 (Work Based)	360 credit points including 240 at level 6/5 of which 120 must be at level 6. BEng Individual Project (Mechanical) 6ENT2047 must	6	All programme learning outcomes (see Table 2)

		be passed without compensation.		
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: <a href="http://sitem.herts.ac.uk/secreg/upr/AS11.htm">http://sitem.herts.ac.uk/secreg/upr/AS11.htm</a>
Certificate of Higher Education		120 credit points at level 4	4, 5	See UPR AS11, section 13: <a href="http://sitem.herts.ac.uk/secreg/upr/AS11.htm">http://sitem.herts.ac.uk/secreg/upr/AS11.htm</a>
Diploma of Higher Education		240 credit points including at least 120 at level 5	5, 6	See UPR AS11, section 13: <a href="http://sitem.herts.ac.uk/secreg/upr/AS11.htm">http://sitem.herts.ac.uk/secreg/upr/AS11.htm</a>
BEng	Mechanical Engineering (Work Based)	300 credit points including 180 at level 6/5 of which 60 must be at level 6	6	A subset of Table 2, depending on modules passed.

Note: Where interim awards are made this will result in non-completion of the apprenticeship.

## Programme-specific assessment regulations

The programme complies with the University's academic regulations (in particular, [UPR AS11](#), [UPR AS12](#) and [UPR AS14](#)) with the exception of those listed below, which have been approved by the University:

- Professional Statutory Regulatory Bodies thresholds will apply for accredited awards as per the Engineering Council Compensation and Condonement notice November 2018. To comply with professional body regulations students must achieve, after all available attempts under the University regulations, a minimum of 30% (in any allowable attempt) at levels 4, 5 and 6, before the board of examiners will be able to consider compensation for an accredited honours degree.
- A compensated pass cannot be awarded for the individual project (6ENT2047), which must be included in the calculation of degree classification.** Students who do not succeed in the individual project may be eligible to repeat and will be allocated an entirely different project.
- For non-honours awards, the standard University regulations on progression and compensation shall apply, and the Programme Board of Examiners shall have discretion to transfer a student onto a non- honours award where it is to the advantage of the student to do so (for example, where the criteria for progression on an accredited award have not been met).

Course Code	Award Title	Modules (child instance codes & title)	Must be included in classification algorithm?
PEDAMECH	BEng (Hons) Mechanical Engineering (Work Based)	6ENT2081-0904 BEng Individual Project (Mechanical) (Apprenticeship)	Yes

## **E. Management of Programme & Support for student learning.**

### **Management**

The programme is managed and administered through:

- Programme Leader who has overall responsibility for the effective operationalisation of the programme, and ensuring that academic standards are maintained, and an effective student learning experience is provided;
- The Employer Liaison Tutor (ELT), who has responsibility for running regular Progress Review Meetings with the apprentice and their employer;
- Module Leaders who are responsible for individual modules.
- Student representatives on programme committees;
- Dean of School;
- Associate Dean (Academic Quality Assurance);
- Associate Dean (Education);
- Admissions Tutor with responsibility for selection and Initial Needs Assessments;
- Programme Committee where membership is defined by the Standing Order of the Academic Board and includes apprentice representatives.

### **Support**

Students are supported by:

- An Employer Liaison Tutor who will also act as a Personal Tutor;
- An Employer Mentor, provided by the employer;
- A project supervisor;
- An Apprentice Handbook;
- An induction week at the beginning of each new academic session;
- A substantial Student Centre that provides advice on issues such as finance, University regulations, legal matters, accommodation, and international student support;
- Office of Dean of Students, incorporating Chaplaincy, Counselling and nursery;
- Canvas, 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 environments in 2 Learning Resources Centres;
- A Mathematics Drop-in Centre;
- Overseas Orientation;
- Medical Centre;
- University Disability Advisors;
- An Equality Office;
- Careers Enterprise and Employment Services;
- Dedicated Programme site;
- Hertfordshire Students' Union.

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## **F. Other sources of information**

In addition to this Programme Specification, the University 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 [Ask Herts](#) website provides information on a wide range of resources and services available at the University of Hertfordshire including academic support, accommodation, fees, funding, visas, 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/>.

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## G. Entry requirements

Applicants must be working in the engineering sector in a role which provides sufficient work-based learning scope to acquire the knowledge, skills and behaviour expected by the Apprenticeship Standard (see: <https://www.instituteofapprenticeships.org/apprenticeship-standards/product-design-and-development-engineer-degree/>).

For current entry tariff point requirements, please refer to the relevant page for the Course on the University website (see: <https://www.herts.ac.uk/courses/degree-apprenticeships/engineering-degree-apprenticeship-mechanical>) or on the online prospectus.

In addition, applicants must be employed in England and have the right to work in the UK and meet the ESFA funding eligibility criteria (see: [ESFA: funding rules, rates and formula - GOV.UK \(www.gov.uk\)](#)). Please refer to Apprenticeship funding rules for main providers.

### Direct Entry at Year 2

It is possible for apprentices to enter the programme at year 2 if they have prior certified learning. In all instances, applicants will be required to discuss their individual circumstances with the appropriate Admissions Tutor. ESFA funding rules do not allow any repeated learning and all applicants will undergo an initial needs assessment to ensure that the planned programme only includes new learning.

Apprentices applying for direct entry into year 2 are required to have an HND or Foundation Degree, or equivalent, in an appropriate discipline with merits and distinctions in appropriate subjects which must include Mathematics plus technical or physical sciences.

The programme is subject to the University's Principles, Policies and Regulations for the Admission of Students to Undergraduate and Taught Postgraduate Programmes (in UPR SA03), along with associated procedures. These will take account of University policy and guidelines for assessing accredited prior certificated learning (APCL) and accredited prior experiential learning (APEL).

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If you would like this information in an alternative format please contact:  
Hutton Hub Student Administration Service [hhaq@herts.ac.uk](mailto:hhaq@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](mailto:aqo@herts.ac.uk)

# BEng (Honours) Mechanical Engineering (Work Based)

## 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																															
				Knowledge & Understanding			Intellectual Skills																Practical Skills								Transferable Skills				
			Learning outcomes	A1	A2	A3	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	C1	C2	C3	C4	C5	C6	C7	C8	C9	D1	D2	D3	D4
			AHEP codes	SM1p	SM2p	SM3p	EA1p	EA2p	EA3p	EA4p	D1p	D2p	D3p	D4p	D5p	D6p	EL1b	EL2p	EL3p	EL4p	EL5p	EL6p	P1p	P2p	P3p	P4p	P5p	P6p	P7p	P8p	P11p	AGS1	AGS2	AGS3	AGS4
Module Title			Module Code																																
Level 4	Engineering Mathematics (Apprenticeship)	4ENT2086		x			x																		x										
	Engineering Fundamentals (Apprenticeship)	4ENT2085	x													x									x										
	Introduction to Mechatronic Systems (Apprenticeship)	4ENT2090			x	x		x	x	x	x	x	x	x		x	x				x	x	x	x					x	x					
	Electrical Science (Apprenticeship)	4ENT2087	x		x	x	x												x				x	x								x			
	Engineering Professionalism (Apprenticeship)	4ENT2088													x	x	x	x	x	x					x	x	x			x	x	x			
	Programming for Engineers (Apprenticeship)	4ENT2076							x																x										
	Applied Design (Apprenticeship)	4ENT2089								x												x			x								x	x	
	Statics and Dynamics (Apprenticeship)	4ENT2075	x			x	x	x																	x										
Level 5	Sustainable Design (Apprenticeship)	5ENT2084			x	x		x	x	x	x	x	x	x			x	x				x	x	x	x				x	x	x				
	Thermodynamics (Apprenticeship)	5ENT2074	x			x	x																												
	Fluid Mechanics (Apprenticeship)	5ENT2081	x			x	x																												



[illegible]

## KEY TO PROGRAMME LEARNING OUTCOMES

### Knowledge and Understanding

- A1. Demonstrate knowledge and understanding of the scientific principles and methodology underpinning mechanical engineering, to enable appreciation of the scientific and engineering context, and to support their understanding of relevant historical, current and future developments and technologies.
- A2. Demonstrate 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. Be able to apply and integrate knowledge and understanding of other engineering disciplines to support a study of mechanical engineering.

### Intellectual Skills

- B1. Demonstrate understanding of engineering principles and the ability to apply them to analyse of key engineering processes.
- B2. Be able to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques.
- B3. Be able to apply quantitative and computational methods in order to solve engineering problems and implement appropriate action.
- B4. Demonstrate understanding of, and the ability to apply, an integrated or systems approach to solving engineering problems.
- B5. Demonstrate understanding and be able to evaluate business, customer, and user needs, including considerations such as the wider engineering context, public perception and aesthetics.
- B6. 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.
- B7. Work with information that may be incomplete or uncertain and quantify the effect of this on the design.

### Practical Skills

- C1. Demonstrate understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, application and development of technology, etc.)
- C2. Demonstrate knowledge of characteristics of particular materials, equipment, processes or products.
- C3. Be able to apply relevant practical and laboratory skills
- C4. Be able to use locate and use technical literature and other information sources to support critical analysis.
- C5. Demonstrate knowledge of relevant legal and contractual issues.
- C6. Demonstrate understanding of appropriate codes of practice and industry standards relevant to engineering.
- C7. Demonstrate understanding of quality issues and their application to continuous improvement.
- C8. Be able to work with technical uncertainty.
- C9. Be able to work in engineering teams.

### Transferable Skills

- D1. Be able to apply problem solving, communication, information retrieval skills when working with others and demonstrating the effective use of general IT facilities.
- D2. Plan self-learning to improve performance, as the foundation for lifelong learning/CPD.

- B8. Be able to 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.
- B9. Plan and manage the design process, including cost drivers, and evaluate outcomes.
- B10. Communicate their work to technical and non-technical audiences.
- B11. Demonstrate understanding and need for a high level of professional and ethical production in engineering and a knowledge of professional codes of conduct.
- B12. Demonstrate knowledge and understanding of the commercial, economic, and social context of engineering processes
- B13. Demonstrate knowledge and understanding of management techniques, including project management that may be used to achieve engineering objectives
- B14. Demonstrate understanding of the requirement for engineering activities to promote sustainable development and ability to apply quantitative techniques where appropriate.
- B15. Demonstrate awareness of the relevant legal requirements governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and liability issues.
- B16. Demonstrate knowledge and understanding of risk issues, including health and safety, environmental and commercial risk, risk assessment and risk management techniques.

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.

**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 Mathematics (Apprenticeship)	4ENT2086	D					D
	Engineering Fundamentals (Apprenticeship)	4ENT2085	D					D
	Introduction to Mechatronic Systems (Apprenticeship)	4ENT2090		D		D	D	
	Electrical Science (Apprenticeship)	4ENT2087	D		D			D
	Engineering Professionalism (Apprenticeship)	4ENT2088	D		D			D
	Programming for Engineers (Apprenticeship)	4ENT2076		D		D		D
	Applied Design (Apprenticeship)	4ENT2089	D	D			D	
	Statics and Dynamics (Apprenticeship)	4ENT2075	D					D
Level 5	Sustainable Design (Apprenticeship)	5ENT2084	D	D	D	D	D	
	Thermodynamics (Apprenticeship)	5ENT2074	D		D			D
	Fluid Mechanics (Apprenticeship)	5ENT2081	D		D			D
	Materials in Engineering (Apprenticeship)	5ENT2075			D			D
	Dynamics and Vibration (Apprenticeship)	5ENT2082	D					D
	Structural Mechanics (Apprenticeship)	5ENT2083	D					D
	Introduction & Application of Control Systems (Apprenticeship)	5ENT2076				D		D
	Industrial Mechanics (Apprenticeship)	5ENT2085	D	D		D	D	
Level 6	Advanced Mechanics (Apprenticeship)	6ENT2074	D					D
	Lean Manufacturing and Supply Chains (Apprenticeship)	6ENT2077	D	D		D	D	

	Renewable Energy and Environment (Apprenticeship)	6ENT2079	D	D	D			D
	Acoustics (Apprenticeship)	6ENT2076	D					D
	Engineering Operations and Project Management (Apprenticeship)	6ENT2078	D	D	D			
	Product Improvement and Quality Management (Apprenticeship)	6ENT2080	D	D			D	
	BEng Individual Project (Mechanical) (Apprenticeship)	6ENT2081	D	D	D	D		D

# Section 2

## Programme management

Relevant QAA subject benchmarking statements	Engineering
Type of programme	Undergraduate – Apprenticeship Degree
Date of validation/last periodic review	July 24
Date of production/ last revision of PS	July 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
PEDAMECH	BEng (Hons) Mechanical Engineering (Work Based)	100190	N/A