

# Mechanical Engineering MEng

## COURSE DETAILS

- A level requirements: [AAA](#)
- UCAS code: H301
- Study mode: Full-time
- Length: 4 years

## KEY DATES

- Apply by: [25 January 2023](#)
- Starts: 25 September 2023

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## Course overview

Study Mechanical Engineering and learn to design, build and test new products, processes and systems. You'll develop holistic engineering knowledge and problem solving abilities as you work towards an industry-accredited degree that's sought after in a wide range of sectors. This four-year Master of Engineering degree satisfies the academic requirements for you to register as a Chartered Engineer.

## INTRODUCTION

Mechanical engineering is one of the oldest and broadest engineering disciplines and is the basis for a wide range of careers in engineering and beyond.

Our professionally accredited Mechanical Engineering programme offers an exciting blend of learning experiences. You'll master the fundamentals of mechanical engineering science and develop the skills, attitudes and experience demanded by 21st century engineering and society. You'll spend as much time outside the lecture theatre as possible, working in teams to apply your learning in the solution of practical problems. Graduates are well

prepared for their careers ahead, and industry recognises them as highly employable.

Mechanical engineering students learn a wide range of theory and skills. This includes engineering science and practical skills such as project management and computer programming.

You'll learn in a modern, well-equipped environment that includes up-to-date laboratories, tools and computing hardware and software.

As you progress through your degree, you can choose to specialise in one of five

themes: biomedical engineering, materials engineering, manufacturing, management,

or simulation and analytics.

## WHAT YOU'LL LEARN

- Design, build and test products and systems
- Mechanical engineering scientific fundamentals
- Thermodynamics
- Fluid and solid mechanics
- Dynamic systems
- Materials
- Electronics and mathematics
- Project management
- Computer programming
- Engineering design
- Collaborative design

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## ACCREDITATION

Mechanical engineering programmes are accredited (or pending accreditation), by the Institution of Mechanical Engineers.

They're a recognised qualification on the route to Chartered Engineer status.

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# Course content

Discover what you'll learn, what you'll study, and how you'll be taught and assessed.

## YEAR ONE

Years one and two give students the scientific understanding underpinning the practice of professional engineering. You'll also learn about project management,

computer programming, and engineering design.

## COMPULSORY MODULES

### ELECTRICAL CIRCUITS FOR ENGINEERS (ELEC121)

**Credits: 7.5 / Semester: semester 1**

To provide students with a basic understanding of electronics from first principles covering analogue and electromechanical systems. Basic circuits and theory will be introduced including the use of semiconductor devices such as diodes and transistors.

Electromechanics will be developed to provide the student with a fundamental knowledge of the principles of DC and AC machines, transformers and linear actuators

### ELECTROMECHANICAL SYSTEMS (ENGG121)

**Credits: 7.5 / Semester: semester 2**

To provide students with a basic understanding of modelling and simulation techniques. Mathematical modelling and graph theory will be introduced to develop practical skills in the modelling and designing of different types of systems including electromechanical systems.

### FLUID MECHANICS (ENGG113)

**Credits: 7.5 / Semester: semester 1**

This module introduces fluid mechanics to the First Year Undergraduate students, describes the fundamental principles of fluid property, dimension analysis, hydrostatics and hydrodynamics. Students will be able to solve simple engineering problems involves steady fluid flow.

### INTRODUCTION TO STATISTICS AND PROGRAMMING FOR ENGINEERS (ENGG185)

**Credits: 7.5 / Semester: semester 1**

This module introduces students to the basic concepts and principles of elementary statistics and programming. It explains the purposes and advantages of analysing data collected specifically to solve problems in engineering, reviews available software tools and programming languages used to formulate and answer basic engineering questions. It draws on examples from applications across the range of School of Engineering program areas.

## **INTRODUCTION TO STRUCTURAL MATERIALS (ENGG108)**

**Credits: 7.5 / Semester: semester 1**

This module introduces students to important mechanical properties of metallic alloys, polymers, ceramics, construction materials and composites used in engineering industry. It also introduces the mechanical testing techniques used to measure such properties, the common mechanisms of materials and component failure in use, and some appreciation of materials processing. The laboratory sessions are designed to familiarise students with engineering laboratory methods and procedures, as well as providing an experience of hands-on mechanical testing techniques.

## **ENGINEERING MATHEMATICS (MATH198)**

**Credits: 22.5 / Semester: whole session**

MATH198 is a Year 1 mathematics module for students of programmes taught in the School of Engineering, e.g. Aerospace, Civil, Mechanical or Industrial Design Engineering. It is designed to reinforce and build upon A-level mathematics, providing you with the strong background required in your engineering studies and preparing you for the Year 2 mathematics module MATH299 (Mathematics engineering II). In the first semester, the foundations are laid: differential calculus, vector algebra, integration and applications. Semester two covers complex numbers, differential equations, Laplace transformations and functions of two variables

## **MECHANICAL ENGINEERING DESIGN A (MECH113)**

**Credits: 15 / Semester: semester 1**

This module provides students with an introduction to mechanical design and the skills required by a professional engineer.

The module is configured around a group design project but is enhanced with lecture material and practical exercises to introduction to mechanical design and the skills required by a professional engineer.

The module is configured around a group design project but is enhanced with lecture material and practical exercises to introduce skills such as technical drawing, data analysis and technical writing.

The majority of these are brought together through their application to the design project that runs alongside them.

## **MECHANICAL ENGINEERING DESIGN B (MECH114)**

**Credits: 15 / Semester: semester 2**

This module provides students with a hands on introduction to mechanical design and the skills required by a professional engineer.

The module is configured around a group design project but is enhanced with lecture material and practical exercises to introduce skills such as report writing, oral presentation, computer aided design and the analysis of engineering mechanisms and components.

The majority of these are brought together through their application to the design project that runs alongside them.

**MECHANICAL PRODUCT DISSECTION (MECH109)****Credits: 7.5 / Semester: semester 2**

This is predominantly a practical module in which students work in small groups to examine in detail the workings and manufacture of a single-cylinder, 4-stroke petrol engine by dismantling it into component parts and documenting the disassembly process in a Wiki.

**SOLIDS AND STRUCTURES 1 (ENGG110)****Credits: 15 / Semester: whole session**

This module aims to introduce students to the fundamental concepts and theory of how engineering structures work to sustain loads. It will also show how stress analysis leads to the design of safer structures. It will also provide students with the means to analyse and design basic structural elements as used in modern engineering structures.

**THERMODYNAMICS I (ENGG112)****Credits: 7.5 / Semester: semester 2**

The module provides an introduction to the laws of thermodynamics which are essential to understanding many branches of engineering. The module will be taught through reference to everyday examples and applications drawn from aerospace, civil and mechanical engineering.

*Programme details and modules listed are illustrative only and subject to change.*

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**YEAR TWO**

Years one and two give students the scientific understanding underpinning the practice of professional engineering. You'll also learn about project management,

computer programming, and engineering design.

**COMPULSORY MODULES****AEROENGINES (AERO213)**

**Credits: 15 / Semester: whole session**

This module covers the main technical aspects of gas turbine engines used on aircraft and other mechanical applications (e.g. power generation, marine). It covers many topics from the basic principles of aeroengines (e.g. production of thrust) through to the design of axial flow turbomachinery (compressors and turbines). An understanding of the principles of compressible flow is also developed. Students do a laboratory using the Virtual Engine Test Bench to explore aeroengine components, thermodynamics and performance. In addition, they use a commercial CFD package to perform a compressible flow simulation.

**DYNAMIC SYSTEMS (MECH215)****Credits: 15 / Semester: whole session**

Dynamic systems are encountered in most engineering disciplines such as mechanical engineering, aerospace engineering, electrical engineering. These systems require specific techniques to be analysed for design or monitoring purpose.

In this module, students will learn the main methods for analysing dynamic systems in time and frequency domains. They will learn how to solve dynamical problems, how to evaluate and control the stability, the accuracy and the rapidity of a dynamical system.

This module will be mainly delivered through class lectures and assessed through a final exam. Additionally, students will be taught some experimental techniques related to second-order dynamical systems through an assessed laboratory work.

**ENGINEERING DESIGN (MECH212)****Credits: 15 / Semester: whole session**

Professional Engineering can be defined as the application of science in the solution of problems and the development of new products, processes and systems. It is vital that all Engineering graduates have a solid design education; and this module is a core part of that.

In Year 1 students are introduced to the basic tools and techniques involved in engineering design.

In this module students are taught the basics of design theory in a lecture setting; but crucially they are required to apply this learning in a 24-week group project to design an innovative engineering product.

Students are given a design brief and are "coached" through product design specification; creative conceptual design; detailed design; 3D CAD modelling; design for manufacture, assembly and environment; and materials selection.

The module also enables students to develop and practice teamwork, communication, project management and problem solving skills.

**ENGINEERING MATHEMATICS II (MATH299)****Credits: 7.5 / Semester: semester 1**

To introduce some advanced Mathematics required by Engineers, Aerospace Engineers, Civil Engineers and Mechanical Engineers. To assist students in acquiring the skills necessary to use the mathematics developed in the module.

### **EXPERIMENTAL METHODS (ENGG201)**

**Credits: 7.5 / Semester: semester 1**

The module focusses on the essentials of data analysis and interpretation, engineering experimentation, measurement techniques and principles of instrumentation.

### **MATERIALS PROCESSING AND SELECTION I (MATS214)**

**Credits: 7.5 / Semester: semester 1**

This module introduces the main materials processing and manufacturing techniques used to shape metals. It also introduces technologies used to modify the surface properties of metal components, and heat-treatment procedures used to change materials' mechanical properties.

### **MATERIALS PROCESSING AND SELECTION II (MATS210)**

**Credits: 7.5 / Semester: semester 2**

This module covers non-metallic materials and materials selection. The students will understand the processing, microstructure and properties of ceramic, polymer and composite materials. The students will also learn how to derive materials performance indices and select materials for mechanical design.

### **PROGRAMMING FOR ENGINEERS 1 (ENGG286)**

**Credits: 7.5 / Semester: semester 1**

Students will be introduced to the basic concepts of computer programming in the MATLAB language to solve engineering problems. This will include basic programming constructs, mathematical operations, file input and output, and data visualization.

### **PROJECT MANAGEMENT (MNGT202)**

**Credits: 7.5 / Semester: semester 1**

Project Management is a core skill for professional engineers of all types and a sound education in this subject area is required by the professional accrediting bodies. The knowledge and skills developed in this module will equip students for their future UG project work and for their careers ahead.

This module teaches students the theory of fundamental techniques in project management, risk management, and cost management.

In this modules student undertake a group "virtual project" in which they undertake all stages of project management involved n a major construction projects. The five virtual project tasks require students to apply their theoretical learning; and they provide an opportunity to develop key professional skills.

### **SOLIDS & STRUCTURES 2 (ENGG209)**

**Credits: 15 / Semester: whole session**

This module aims to introduce students to techniques for load and displacement analysis of simple structures.

### **THERMODYNAMICS (MECH217)**

**Credits: 15 / Semester: whole session**

Steam, standard air and refrigeration cycles

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## **YEAR THREE**

In years three and four, you'll study advanced engineering science and undertake a 300-hour research project on a topic of your choice. You can also choose

one of the following engineering specialisms: biomedical engineering, materials engineering, manufacturing, management, or simulation and analytics.

## **COMPULSORY MODULES**

### **ADVANCED MODERN MANAGEMENT (MNGT352)**

**Credits: 7.5 / Semester: semester 1**

### **ENGINEERING FLUID MECHANICS (MECH326)**

**Credits: 15 / Semester: semester 1**

The module provides students with the fundamental concepts of Engineering Fluid Mechanics, and in particular: the role of viscosity in fluid mechanics, including the no-slip condition and the concept of vorticity; the basic principles of laminar and turbulent flow through pipes including definition and evaluation of the Fanning and Darcy friction factors; the concept of a boundary layer, including separation and transition, and basic equations for friction factor in laminar and turbulent flow with zero pressure gradient; the calculation methods of bluff-body drag using drag coefficients with qualitative explanations the potential-flow theory including the concept of irrotationality and the principle of superposition; the analysis of compressible flow through constant-area ducts accounting for friction or heat transfer and to use the Fanno- and Rayleigh-flow tables; the analysis of external compressible flow including expansion and compression turns (Prandtl-Meyer expansions and oblique shock waves).

## **MECHANICAL ENGINEERING CAPSTONE 1 (MECH327)**

**Credits: 15 / Semester: whole session**

The 2-year Capstone Projects are a hallmark of the Mechanical Engineering MEng programmes at Liverpool. They are group projects in which students apply their scientific knowledge, design training and management skills to design-build-test innovative engineering products or systems. These projects provide students an opportunity to develop and evidence a wide range of technical, personal and professional skills. The Capstone modules make the greatest contribution to graduate employability.

Students are given the choice of project from a portfolio of 6-8 options: some target international sporting competition (eg Velocipede or Formula Student); others are industry-led and address real world challenges (eg Nuclear Rover decommissioning robot with NNL or Paediatric Wheelchairs with Alder Hey Hospital). The range of available projects varies each year.

Each project team is assigned an academic project supervisor and a dedicated member of technical staff. You will work closely with these staff and a range of other technical experts from industry and/or the research community. It should be noted that the students "own" their project and it is their responsibility to specify, plan, manage and report on all project work.

Students will be timetabled for 4-hours per week but will be expected to spend a significant amount of additional time working on their project.

A variety of assessment methods are used that are as close as possible to professional engineering practice.

At four key points in the year the Careers and Employability Service will join the module to help students reflect on, record in CV, and communicate at interview the professional development.

## **HEAT TRANSFER (MECH301)**

**Credits: 15 / Semester: semester 2**

## **INDIVIDUAL PROJECT (ENGG341)**

**Credits: 30 / Semester: whole session**

The Year 3 individual research project; 300 hours student work over 2 semesters; 3 assessment stages (proposal 5%, interim 20%, final 75%).

## **INTRODUCTION TO FINITE ELEMENTS (ENGG302)**

**Credits: 7.5 / Semester: semester 1**

In this module the students will gain a basic understanding of the Finite Element method and learn to use some Finite Element software. This software will then be used to analyse a variety of different problems which are relevant to both mechanical and civil engineers.

## **SOLID MECHANICS – STRUCTURAL FAILURE MODES (MECH307)**

**Credits: 7.5 / Semester: semester 1**

Students taking this module will be given an understanding of potential structural failure modes in the early stages of design that can lead to a more appropriate selection of materials, prevent premature failure and lengthen the life of a machine or component; ultimately resulting in increased safety and reduced cost of ownership.

**VIBRATION AND CONTROL (MECH303)****Credits: 15 / Semester: semester 2**

This module is built on MECH215. It consists of Vibration and Control as 2 main components. Both are on an advanced level and basically deal with multi-degree-of-freedom (or multi-input multi-output) systems.

The main mathematical tools are Laplace transforms, differential equations, simultaneous linear equations, complex numbers, trigonometry, vectors and matrices, eigenvalues and eigenvectors.

**OPTIONAL MODULES****ADDITIVE MANUFACTURING (MNFG308)****Credits: 7.5 / Semester: semester 1****ADVANCED ENGINEERING MATERIALS (MATS301)****Credits: 7.5 / Semester: semester 1**

This module aims to understand advanced engineering materials, focusing on non-ferrous alloys and composite materials. It covers the processing, heat treatment, microstructure and properties of Al, Ti and Ni alloys. It introduces constituent materials, manufacturing methods, test methods and mechanical response of composite materials.

**BIOMEDICAL ENGINEERING (MECH305)****Credits: 7.5 / Semester: semester 1**

This module will introduce the inter-disciplinary subject of biomedical engineering to engineering students with a focus on biomechanics of the cardiovascular system, the eye and bone.

The module will cover ageing and disease of tissues and prosthetic devices including their design and optimisation for tissue repair. The course will be delivered with lectures containing interactive elements.

Assessment will be via an exam and two pieces of coursework.

**MANAGING PRODUCT DEVELOPMENT (MNGT205)****Credits: 7.5 / Semester: semester 1**

The module teaches the management of new product development. It is taught in a traditional lecture style culminating in an exam.

Successful students will have acquired knowledge and understanding at a broad level of the process and how it is executed in a modern industrial environment.

### **UNCERTAINTY, RELIABILITY AND RISK 1 (ENGG304)**

**Credits: 7.5 / Semester: semester 1**

This module covers broad aspects of uncertainty quantification methods, reliability analysis and risk assessment in engineering applications. It also provides understanding of statistical analysis of engineering data and computational methods for dealing with uncertainty in engineering problems.

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## **YEAR FOUR**

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one of the following engineering specialisms: biomedical engineering, materials engineering, manufacturing, management, or simulation and analytics.

## **COMPULSORY MODULES**

### **ADVANCED FLUID MECHANICS (ENGG419)**

**Credits: 15 / Semester: semester 1**

Advanced Fluid Mechanics covers fluid motion in a range of problems of engineering interest. Both laminar and turbulent flows will be considered. Limiting cases of the equations of motion will be solved analytically and with the aid of simple numerical methods programmed in Matlab (R). The full equations of motion will be described and solved numerically using the open-source Computational Fluid Dynamics software package OpenFOAM (R).

The module will be delivered via a series of lectures, computing room exercises and tutorial sessions. It will be assessed through three courseworks (30%) and a final examination (70%).

### **ENERGY AND THE ENVIRONMENT (MECH433)**

**Credits: 15 / Semester: semester 2**

This modules discusses energy generation and usage, and how they complement each other. The topics are introduced in lectures that then lead onto a case study on a specific topic.

### **ENTERPRISE STUDIES (MNGT414)**

**Credits: 7.5 / Semester: semester 2**

The module teaches the concepts of Entrepreneurship, Intrapreneurship, Company Infrastructure and Investment Proposals. It is taught using lectures, class questions, case studies and a comprehensive coursework assignment. Successful students will have acquired knowledge and understanding at mastery level of the process and how it is executed in a modern industrial environment.

**MECHANICAL ENGINEERING CAPSTONE 2 (MECH431)****Credits: 30 / Semester: whole session**

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Students will be timetabled for 4-hours per week but will be expected to spend a significant amount of additional time working on their project.

A variety of assessment methods are used that are as close as possible to professional engineering practice.

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**STRUCTURAL INTEGRITY (ENGG409)****Credits: 15 / Semester: semester 2**

This module introduces the concepts required to maintain structural integrity. Topics covered are: detecting structural defects, predicting when defects will cause failure, and mitigating against failure.

**NUCLEAR TECHNOLOGIES (MECH434)****Credits: 7.5 / Semester: semester 1**

The module provides an understanding of nuclear engineering, with coverage going from the atomic scale through to the bulk scale. The topics will cover reactor dynamics, design and operation, lifetime behaviour, evolution of technologies and nuclear waste. For example, understanding the implications of the fission/fusion processes themselves on the behaviour of the core.

## **OPTIONAL MODULES**

### **ADVANCED 4TH YEAR RESEARCH PROJECT (ENGG443)**

**Credits: 15 / Semester: whole session**

This module focuses on a specific project related to a student's third year project, with a journal style paper written.

### **ADVANCED ELECTRON MICROSCOPY OF MATERIALS STRUCTURES AND PROCESSES (MATS403)**

**Credits: 15 / Semester: semester 1**

The module will provide engineering, chemistry, physics and potentially other students another view of how atomic structure and defects in atomic structure lead to the properties of advanced materials used in such applications as structural materials, catalysts, batteries and semiconducting devices. The students will gain knowledge on how different structures form from different components and how materials design for a given application is determined by whether the atoms involved form polymers, ceramics or metals. The students will learn how to use electron microscopy to characterise materials by their components and understand how to determine the mechanisms by which defect structures/chemistry controls the properties of materials used for modern engineering applications.

### **FORMULATION ENGINEERING (ENGG413)**

**Credits: 7.5 / Semester: semester 1**

This module will provide engineering, chemistry and potentially other students an overview of complex fluids, their processing, rheology and applications. The students will gain knowledge on: different formulations (suspensions, emulsions, foams); colloidal processing (starting from clay as archetype, and delving into ceramic, polymer and 2D colloids); their flow and rheology; and their role in manufacturing in a diversity of processes from food processing and personal care to additive manufacturing.

### **FUNCTIONAL MATERIALS (MATS402)**

**Credits: 7.5 / Semester: semester 2**

This module considers the functional properties of engineering materials and how they are exploited in modern technology. The relationships between functional properties and the fundamental nature of different materials will be developed. Then the processing of functional materials in the manufacture of functional devices will be addressed. A range of applications of functional materials in sensors, electronic and optoelectronic devices will be considered.

### **INTEGRATED SYSTEMS DESIGN (MNFG615)**

**Credits: 15 / Semester: semester 2**

### **LASER MATERIALS PROCESSING (MECH605)**

**Credits: 15 / Semester: semester 1**

The module will cover: how lasers work, what are the key beam properties of high power lasers, how the beam is deployed and delivered to the process/workpiece, safety in laser materials processing, and the working principles and industry practice for a range of laser processes.

### **MECHATRONICS (MECH415)**

**Credits: 7.5 / Semester: semester 1**

This module aims to provide students with an appreciation of the challenges related to the design of Mechatronics systems. Both hardware and software integration issues will be studied within this module. General design principles will be introduced first and learning will focus on the popular Arduino platform. The module will also expose students to state-of-the-art robotics, as example of modern mechatronic systems.

### **MUSCULOSKELETAL BIOMECHANICS (ENGG410)**

**Credits: 15 / Semester: semester 2**

This module will give students an understanding of the biomechanics of the musculoskeletal system and will cover techniques used to measure and analyse body movements as mechanical systems.

### **PROGRAMMING FOR ENGINEERS 2 (ENGG487)**

**Credits: 7.5 / Semester: semester 2**

This module extends the coverage of Matlab and introduces Simulink as a tool for creating simulation models of dynamical systems.

### **RISK AND UNCERTAINTY: PROBABILITY THEORY (ENGG404)**

**Credits: 7.5 / Semester: semester 1**

This module develops understanding and appreciation of basic probability theory. It involves the quantification of uncertainties in the input and modelling, their implementation and the evaluation of the associated results in view of decision making. An introduction to numerical concepts will be provided. The methods shown in the module have a general applicability, which is demonstrated by examples and practical applications.

### **SMART MATERIALS (MATS515)**

**Credits: 7.5 / Semester: semester 2**

This module introduces students to the facilitating world of 'Smart Materials'. The term 'Smart Materials' is used to define a broad collection of materials that have the in-built ability to 'actuate' in some way in response to external stimulus. Examples of 'Smart materials' include piezoelectrics, electrostrictive materials, shape memory alloys, ferrofluids, various biomimetic materials plus a host of others. This module looks at a selection of smart materials and considers the underlying reasons for the actuating behavior, key performance indicators that aid materials selection, aspects of manufacturing associated with the exploitation of the materials, plus engineering applications of these facilitating and highly useful materials.

### **STRUCTURAL BIOMATERIALS (MATS410)**

**Credits: 15 / Semester: semester 1**

This module covers topics related to the structure and properties of materials that are used in medical devices, including metals and alloys, polymers and ceramics. Corrosion and polymer degradation is also covered.

### **TISSUE ENGINEERING (ENGG412)**

**Credits: 15 / Semester: semester 2**

The module will explore the understanding for the need for enhanced control of material induced biological interactions and how we can utilise novel material development and engineering techniques to control biological responses from the "bottom-up" (controlled biological interactions), developing the next generation of smart-implantable medical devices. As well as presenting fundamental concepts that are relevant to real clinical situations the module will also explore the need for cost effective solutions and viable routes for scale up and translation.

### **DESIGN FOR ENVIRONMENT, MANUFACTURE AND ASSEMBLY (MNFG413)**

**Credits: 7.5 / Semester: semester 2**

### **ADVANCED MATERIALS DESIGN (MATS602)**

**Credits: 7.5 / Semester: semester 2**

### **INDUSTRIAL ROBOTICS AND AUTOMATED ASSEMBLY (MNFG409)**

**Credits: 15 / Semester: semester 2**

This module investigates how industrial robots and other equipment are used and integrated into more complex automated systems. The module emphasis is upon the application and use of these systems, with less emphasis on the underlying theoretical mechanisms. The module is based in the concept of learning through doing, the underlying content being presented as videos, while the contact time is used in practical sessions using industrial robots and in the development of robotic systems using industrial simulation software. The assessments are designed to help reinforce understanding rather than short term memory. As an FHEQ level 7 module the tasks and assessments are designed to develop deeper knowledge and skill in application than that expected for those at FHEQ level 6.

*Programme details and modules listed are illustrative only and subject to change.*

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**HOW YOU'LL LEARN**

Lecture-based learning is complemented by a wide range of laboratory work, practical challenges, team-based 'design-build-test' projects, site visits and other activities. We teach you to be "industry ready" by embedding the conception, design and implementation of real-world systems and products into your course.

You'll spend as much time outside the lecture theatre as possible, working in teams to solve problems and design, build and test new systems and products.

Our teaching is informed by the Engineering and Materials Education Research Group, which advises teachers about innovation in engineering education.

**LIVERPOOL HALLMARKS**

We have a distinctive approach to education, the Liverpool Curriculum Framework, which focuses on research-connected teaching, active learning, and authentic assessment to ensure our students graduate as digitally fluent and confident global citizens.

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# Careers and employability

Mechanical engineering graduates are sought after in engineering fields and a wide range of other sectors. Graduates go on to work in engineering fields including healthcare, food production, aerospace, construction, power generation and manufacturing.

**4 IN 5 OF OUR ENGINEERING STUDENTS FIND THEIR MAIN ACTIVITY AFTER GRADUATION MEANINGFUL.**

*Graduate Outcomes, 2018-19.*

Recent employers of Mechanical Engineering graduates include:

- Airbus
- Arup
- BAE Systems
- Balfour Beatty
- Bentley
- BMI
- British Airways
- British Army
- Corus
- Highways Agency
- Jaguar Land Rover
- Mott Macdonald
- Mouchel
- National Grid Transco
- National Nuclear Laboratory
- Network Rail
- Pilkington
- RAF
- Rolls Royce
- Royal Navy
- Siemens
- Tarmac
- United Utilities

## PREPARING YOU FOR FUTURE SUCCESS

At Liverpool, our goal is to support you to build your intellectual, social, and cultural capital so that you graduate as a socially-conscious global citizen who is prepared for future success. We achieve this by:

- Embedding employability within your curriculum, through the modules you take and the opportunities to gain real-world experience offered by many of our courses.
  - Providing you with opportunities to gain experience and develop connections with people and organisations, including student and graduate employers as well as our global alumni.
  - Providing you with the latest tools and skills to thrive in a competitive world, including access to Handshake, a platform which allows you to create your personalised job shortlist and apply with ease.
  - Supporting you through our peer-to-peer led [Careers Studio](#), where our career coaches provide you with tailored advice and support.
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# Fees and funding

Your tuition fees, funding your studies, and other costs to consider.

## TUITION FEES

Tuition fees cover the cost of your teaching and assessment, operating facilities such as libraries, IT equipment, and access to academic and personal support. [Learn more about tuition fees, funding and student finance.](#)

UK fees	
Full-time place, per year	£9,250
Year in industry fee	£1,850
Year abroad fee	£1,385

International fees	
Full-time place, per year	£24,500

*Fees stated are for the 2022-23 academic year and may rise for 2023-24.*

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## ADDITIONAL COSTS

We understand that budgeting for your time at university is important, and we want to make sure you understand any course-related costs that are not covered by your tuition fee. This may include a laptop, books, or stationery. All safety equipment, other than boots, is provided free of charge by the department.

Find out more about the [additional study costs](#) that may apply to this course.

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## SCHOLARSHIPS AND BURSARIES

We offer a range of scholarships and bursaries to help cover tuition fees and help with living expenses while at university.

[Scholarships and bursaries you can apply for from the United Kingdom](#)

Select your country or region for more scholarships and bursaries.

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# Entry requirements

The qualifications and exam results you'll need to apply for this course.

Your qualification	Requirements <a href="#">About our typical entry requirements</a>
A levels	<p>AAA including Mathematics and a second science.</p> <p>Applicants with the Extended Project Qualification (EPQ) are eligible for a reduction in grade requirements. For this course, the offer is <b>AAB</b> with <b>A</b> in the EPQ.</p> <p>You may automatically qualify for reduced entry requirements through our <a href="#">contextual offers scheme</a>.</p>
GCSE	4/C in English and 4/C in Mathematics
Subject requirements	<p>Mathematics and a second science.</p> <p>Applicants following the modular Mathematics A Level must be studying A Level Physics or Further Mathematics as the second science (or must be studying at least one Mechanics module in their Mathematics A Level).</p> <p>Accepted Science subjects are Biology, Chemistry, Computing, Economics, Electronics, Environmental Science, Further Mathematics, Geography, Geology, Human Biology, Physics and Statistics.</p> <p>For applicants from England: Where a science has been taken at A Level (Chemistry, Biology or Physics), a pass in the Science practical of each subject will be required.</p>
BTEC Level 3 Subsidiary Diploma	Acceptable at grade Distinction alongside AA in A Level Mathematics and a second science.
BTEC Level 3 Diploma	D*D in relevant BTEC considered alongside A Level Mathematics grade A. Accepted BTECs include Aeronautical, Aerospace, Mechanical, Mechatronics and Engineering.

<b>Your qualification</b>	<b>Requirements</b> <a href="#">About our typical entry requirements</a>
BTEC Level 3 National Extended Diploma	Not accepted without grade A in A Level Mathematics
International Baccalaureate	35 overall, including 5 at Higher Level Mathematics and Physics
Irish Leaving Certificate	H1, H1, H2, H2, H2, H2 including H1 in Higher Mathematics and Higher Second Science.
Scottish Higher/Advanced Higher	Pass Scottish Advanced Highers with grades AAA including Mathematics and a second science.
Welsh Baccalaureate Advanced	Not accepted
Cambridge Pre-U Diploma	D3 in Cambridge Pre U Principal Subject is accepted as equivalent to A-Level grade A Global Perspectives and Short Courses are not accepted.
Access	Not accepted

Your qualification	Requirements <a href="#">About our typical entry requirements</a>
International qualifications	<div data-bbox="491 499 927 633" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">           Select your country or region to view specific entry requirements.         </div> <p data-bbox="1002 499 1417 577">guaranteed a place on your chosen course.</p> <p data-bbox="491 667 927 1081">Many countries have a different education system to that of the UK, meaning your qualifications may not meet our entry requirements. Completing your Foundation Certificate, such as that offered by the <a href="#">University of Liverpool International College</a>, means you're</p>

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## ALTERNATIVE ENTRY REQUIREMENTS

- If your qualification isn't listed here, or you're taking a combination of qualifications, [contact us](#) for advice
  - [Applications from mature students](#) are welcome.
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**THE ORIGINAL**

**REDBRICK**