Mechanical Engineering Design with Management MSc (Eng)

COURSE DETAILS

- Full-time: 12 months

KEY DATES

- Apply by: 29 August 2025
- Starts: 22 September 2025

Course overview

The Mechanical Engineering Design with Management MSc aims to develop your academic knowledge and technical engineering skills with the integration of creative, problem-solving design elements within a business context.

INTRODUCTION

Mechanical Engineering Design incorporates designing complex systems in order to develop and evaluate the design performance using technical engineering knowledge and skills, with the aim to continuously improve the product and manufacturing techniques.

Mechanical Engineering Designers are responsible for the design process including the concept of designs, analysis of existing products, production of prototypes for product testing and identification of new systems, processes and feasibility to drive quality, efficiency and save costs.

Mechanical Design Engineers are in demand by employers as they embrace challenges, can solve problems effectively, and have strong technical knowledge – as well as excellent communication and leadership skills.

This MSc will enable you to develop your knowledge and technical skills by combining the numerical, analytical and scientific principles of Mechanical Engineering Design with an in-depth understanding of management and business acumen to master's degree level.

WHO IS THIS COURSE FOR?

BEng Aerospace, Mechanical or Civil Engineering Graduates from University of Liverpool are not eligible for this programme.

WHAT YOU'LL LEARN

- 3D design tools and computer aided design
- Advanced modern management tools
- Fluid mechanics
- Reactor dynamics, design and operation, lifetime behaviour, evolution of technologies and nuclear waste
- Rapid Prototyping, Rapid Manufacturing and Additive Manufacturing
- Advanced engineering materials, focusing on non-ferrous alloys and composite materials.

ACCREDITATION

This programme has been accredited by the Institution of Mechanical Engineers (IMechE), which will help you gain Chartered status.

Course content

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

SEMESTER ONE

UK students are exempt from **Technical Writing for Engineers** and should instead take **Project Management**. EU/International students with strong English language skills can be exempt as well, subject to Programme Director's approval.

For students from suitable backgrounds or University of Liverpool Engineering graduates, replace Engineering Fluid Mechanics with Advanced Fluid Mechanics.

COMPULSORY MODULES

ENGINEERING FLUID MECHANICS (MECH627)

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 irrationality 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).

COMPUTER AIDED DESIGN (MNFG604)

Credits: 7.5 / Semester: semester 1

To introduce the student to the latest 3D tools and techniques used by designers.

To develop a wider knowledge and understanding of integrated systems design.

To stimulate an appreciation of modern design and development methodologies.

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.

PROJECT MANAGEMENT (MNGT502)

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.

ADVANCED MODERN MANAGEMENT (MNGT352)

Credits: 7.5 / Semester: semester 1

The Aims of this module are as follows:

To introduce the student to various aspects of advanced modern management.

To develop a knowledge and understanding of modern management tools.

To stimulate an appreciation of management and its importance in organisational success.

TECHNICAL WRITING FOR ENGINEERS (ENGG596)

Credits: 7.5 / Semester: semester 1

To develop technical writing skills for engineers. English Language Centre deliver the module for non-native English speakers, Engineering staff deliver identical syllabus, assessments and learning outcomes for other students.

GROUP ENGINEERING DESIGN (MECH401)

Credits: 15 / Semester: whole session

To present the fundamental principles of Engineering Product Design according to the Total design methodology.

To engage students in a multi-disciplinary group project to develop and justify an innovative engineering solution/product that is part of a grand challenge which is formulated from complex and uncertain factors.

To develop students team working, communication, project management, problem solving and critical evaluation skills.
To formulate a theoretical novel solution that is supported by valid evidence and meets an authentic need.

OPTIONAL MODULES

FINITE ELEMENT ANALYSIS (MECH452)

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 Abaqus 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

ADDITIVE MANUFACTURING (MNFG610)

Credits: 7.5 / Semester: semester 1

To provide an overview on the role of additive manufacturing in new product development.

To develop a generic understanding on the principles and the complete process chain of additive manufacturing processes.

To provide an awareness on recent developments in additive manufacturing and associated technologies.

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.

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.

Any optional modules listed above are illustrative only and may vary from year to year. Modules may be subject to minimum student numbers being achieved and staff availability. This means that the availability of specific optional modules cannot be guaranteed.

SEMESTER TWO

COMPULSORY MODULES

ADVANCED MANUFACTURING WITH LASERS (MECH607)

Credits: 15 / Semester: semester 2

This module provides an understanding of the principles of advanced manufacturing techniques using lasers and how these are being explored through current/recent research and adopted by industry.

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 studie sand a comprehensive coursework assignment. Successful students will have acquired knowledge and understanding at mastery level of the process and how itis executed in a modern industrial environment.

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.

GROUP ENGINEERING DESIGN (MECH401)

Credits: 15 / Semester: whole session

To present the fundamental principles of Engineering Product Design according to the Total design methodology.

To engage students in a multi-disciplinary group project to develop and justify an innovative engineering solution/product that is part of a grand challenge which is formulated from complex and uncertain factors.

To develop students team working, communication, project management, problem solving and critical evaluation skills.
To formulate a theoretical novel solution that is supported by valid evidence and meets an authentic need.

Any optional modules listed above are illustrative only and may vary from year to year. Modules may be subject to minimum student numbers being achieved and staff availability. This means that the availability of specific optional modules cannot be guaranteed.

FINAL PROJECT

You will undertake and complete your final project over the summer.

COMPULSORY MODULES

MSC(ENG) PROJECT (60 CREDITS) (ENGG660)

Credits: 60 / Semester: summer

The purpose of the project is to provide students with the opportunity to plan, carry out and control a research project at the forefront of their academic discipline, field of study or area of professional practice. The student will report findings both orally and in writing. Detailed instructions are provided in the PG handbook distributed at the outset of the programme.

Any optional modules listed above are illustrative only and may vary from year to year. Modules may be subject to minimum student numbers being achieved and staff availability. This means that the availability of specific optional modules cannot be guaranteed.

HOW YOU'LL LEARN

You'll learn across a variety of teaching methods, like lectures, seminars, and tutorials – some online and some in person. You'll also access asynchronous online content on a weekly basis with personal tutorials and take part in group work projects, based on engineering grand challenges faced by global society today.

There's opportunity to get hands-on too with active learning lab sessions, laser micromachining and lab work using special design software such as Finite Element.

HOW YOU'RE ASSESSED

Across your modules, you'll be assessed in a number of different ways, including exams, lab activity, case studies, project journals, poster presentations, and CAD models of products. You'll also solve example Finite Element problems with randomly generated geometry specifically for you. For each problem, you must report a key result per problem (maximum stress etc.) to within an error tolerance.

Your final project work will be based on a topic of industrial or scientific relevance, and will be carried out in laboratories in the University or at an approved placement in industry. You'll examine this project in your dissertation and show evidence of in-depth understanding, mastery of research techniques, ability to analyse assembled data, and assessment of outcomes.

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.

Careers and employability

This programme includes a strong practical element and incorporates the latest academic and industry research, enabling you to work effectively at the forefront of engineering.

Career support from day one to graduation and beyond

-

Career planning

Our Careers Studio and career coaches can provide tailored support for your future plans.

-

From education to employment

Employability in your curriculum for a successful transition

-

Networking events

Make meaningful connections with like-minded professionals

YOUR FUTURE

Career Destinations are wide and varied**.** Some employers include:

- Agusta Westland
- NHS
- BAE Systems
- Ford
- Jaguar
- Unilever
- Armed Forces
- QinetiQ

- National and International bodies such as EPSRC and the European Commission.

Fees and funding

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

TUITION FEES

UK fees (applies to Channel Islands, Isle of Man and Republic of Ireland)	
Full-time place, per year	£13,300

International fees	
Full-time place, per year	£29,900

Fees stated are for the 2025-26 academic year.
Tuition fees cover the cost of your teaching and assessment, operating facilities such as libraries, IT equipment, and access to academic and personal support.

- You can pay your tuition fees in instalments.
- All or part of your tuition fees can be funded by external sponsorship.
- International applicants who accept an offer of a place will need to pay a tuition fee deposit.

If you're a UK national, or have settled status in the UK, you may be eligible to apply for a Postgraduate Loan worth up to £12,167 to help with course fees and living costs. **Learn more about fees and funding**.

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 could include buying a laptop, books, or stationery.

Find out more about the additional study costs that may apply to this course.

SCHOLARSHIPS AND BURSARIES

We offer a range of scholarships and bursaries that could help pay your tuition and living expenses.

We've set the country or region your qualifications are from as United Kingdom. Change it here

-

POSTGRADUATE GLOBAL ADVANCEMENT SCHOLARSHIP – ACHIEVEMENT

- International students

If you're an international student joining a master's course with us, you could be eligible to receive a tuition fee discount of £2,500, based on your prior academic achievement, choice of course, and you not having studied with us before.

-

POSTGRADUATE GLOBAL ADVANCEMENT SCHOLARSHIP – COUNTRY

- International students
- Antigua and Barbuda
- Australia
- Bangladesh
- Barbados
- Belize
- Brunei
- Canada
- China
- Cyprus
- Dominica
- Egypt
- Ghana
- Grenada
- Guyana
- India
- Jamaica
- Japan
- Kenya
- Malaysia
- Mauritius
- Mexico
- New Zealand
- Nigeria
- Pakistan
- Saint Kitts and Nevis
- Saint Lucia
- Saint Vincent and The Grenadines
- Singapore
- South Africa
- South Korea
- Sri Lanka
- Tanzania
- Thailand
- Trinidad and Tobago

- Turkey
- Uganda
- Vietnam

If you're an international student joining a master's course with us, you could be eligible to receive a tuition fee discount of £2,500, based on your nationality, choice of course, and you not having studied with us before.

-

GRADUATE LOYALTY ADVANCEMENT SCHOLARSHIP

- Home and international students

If you're a University of Liverpool graduate starting this master's degree with us, you could be eligible to receive a loyalty discount of up to £2,500 off your master's tuition fees.

-

CHILEAN NATIONAL AGENCY FOR RESEARCH AND DEVELOPMENT (ANID) SCHOLARSHIP

- International students
- Chile

If you're a Chilean student joining a master's degree, you could be eligible to apply for a 20% discount on your tuition fees with a Chilean National Agency for Research and Development (ANID) Scholarship. Scholarship.

-

CHEVENING SCHOLARSHIPS

- International students
- Albania
- Algeria
- Anguilla
- Antigua and Barbuda
- Argentina
- Australia
- Azerbaijan
- Bangladesh
- Barbados
- Belize
- Bolivia
- Brazil
- British Virgin Islands
- Brunei
- Canada
- Cayman Islands
- Chile
- China
- Columbia
- Costa Rica
- Cuba
- Dominica

- Ecuador
- Egypt
- El Salvador
- Ghana
- Guatemala
- Guyana
- Honduras
- Hong Kong
- Iceland
- India
- Indonesia
- Iraq
- Jamaica
- Japan
- Jordan
- Kazakhstan
- Kenya
- Libya
- Malaysia
- Mauritius
- Mexico
- Moldova
- Mongolia
- Montserrat
- Morocco
- Nepal
- New Zealand
- Nicaragua
- Nigeria
- Pakistan
- Panama
- Paraguay
- Peru
- Philippines
- Russia
- Saint Kitts and Nevis
- Saint Lucia
- Saint Vincent and The Grenadines
- Serbia
- Singapore
- South Africa
- South Korea
- South Sudan
- Sri Lanka
- Sudan
- Taiwan
- Tanzania
- Thailand

- Trinidad and Tobago
- Turkey
- Turks and Caicos Islands
- Uganda
- Ukraine
- Uruguay
- Venezuela
- Vietnam
- Zimbabwe

If you're an international student from an eligible country, joining a one-year master's course, you could be eligible to apply for a Chevening Scholarship. If your application is successful, you could expect to have your master's fees paid, up to a maximum of £18,000, and receive additional help with living costs.

-

CONSEJO NACIONAL DE CIENCIA Y TECNOLOGIA (CONACYT) AWARD

- International students
- Mexico

If you're a Mexican student joining a master's degree, you could be eligible to apply for a 30% discount on your tuition fees with a CONACyT Award.

-

FUND FOR THE DEVELOPMENT OF HUMAN RESOURCES (FIDERH) AWARD

- International students
- Mexico

If you're a Mexican student joining a master's degree and you're in receipt of a FIDERH graduate loan, you could be eligible to benefit from a 20% discount on your tuition fees with a FIDERH Award.

-

FUNED AWARD

- International students
- Mexico

If you're a Mexican student joining a master's degree and you're in receipt of a FUNED loan, you can apply to be considered for a 20% tuition fee discount. A total of up to 50 awards will be available to master's and PhD students per academic year.

-

FUNED SCHOLARSHIP FOR WOMEN IN STEM SUBJECTS

- International students
- Mexico

If you're a female Mexican student joining an eligible master's course in a science, technology, engineering or maths (STEM) subject and you're in receipt of a FUNED loan, you can apply to be considered for a 25% tuition fee discount. Up to five awards are available in each academic year.

- ## HONG KONG GRADUATE ASSOCIATION & TUNG FOUNDATION POSTGRADUATE SCHOLARSHIPS

  - International students
  - China
  - Hong Kong

  If you're a master's student from Hong Kong or the People's Republic of China who can demonstrate academic excellence, you may be eligible to apply for a scholarship worth up to £10,000 in partnership with the Tung Foundation.

- ## HRH PRINCESS SIRINDHORN UNIVERSITY OF LIVERPOOL SCHOLARSHIP (THAILAND)

  - International students
  - Thailand

  If you're a student from Thailand joining a one-year master's degree, you might be eligible to apply to have your tuition fees paid in full and receive help with living costs. One award is available and only students who are new to the University will be considered.

- ## HUMANITARIAN SCHOLARSHIPS FOR MASTER'S PROGRAMMES

  - International students

  Do you have recognised status as a refugee or person with humanitarian protection outside the UK? Or are you a Ukrainian who's sought temporary protection in the EU? You could be eligible to apply for the full payment of your master's fees and additional financial support.

- ## JOHN LENNON MEMORIAL SCHOLARSHIP

  - Home students

  If you're a UK student, either born in or with strong family connections to Merseyside, you could be eligible to apply for a fee discount of up to £4,500. You'll need to demonstrate an active interest in global, community and environmental issues to be considered.

- ## JUVENTUDESGTO SCHOLARSHIP

  - International students
  - Mexico

  If you're a resident of the state of Guanajuato in Mexico joining a master's degree, you could be eligible for a 10% discount on your tuition fees with a JuventudEsGto Scholarship.

- ## KAPLAN DIGITAL PATHWAYS EXCELLENCE SCHOLARSHIP

  - International students

  Completed a Kaplan Digital Pathways Pre-Master's? We're offering a £5,000 fee discount off the first year of master's study for a maximum of two high achieving students joining one of our non-clinical master's courses from an online Kaplan Pre-Master's programme.

-

MARSHALL SCHOLARSHIP

- International students
- United States

If you're a USA student joining an eligible master's with us, you could be eligible to apply for a Marshall Scholarship. If your application is successful, your master's tuition fees will be paid in full. One Marshall Scholarship for master's study is available in each academic year.

-

POSTGRADUATE OPPORTUNITY BURSARY

- Home students

If you're a UK University of Liverpool graduate joining a master's degree with us, you could be eligible to receive £3,000 off your tuition fees. You must have graduated in the last two years and received a widening access scholarship during your undergraduate studies.

-

SPORT LIVERPOOL PERFORMANCE PROGRAMME

- Home and international students

Apply to receive tailored training support to enhance your sporting performance. Our athlete support package includes a range of benefits, from bespoke strength and conditioning training to physiotherapy sessions and one-to-one nutritional advice.

-

TURKISH MINISTRY OF EDUCATION SCHOLARSHIP

- International students
- Turkey

If you're a Turkish student joining a master's degree, you could be eligible to apply for a 20% discount on your tuition fees with a Turkish Ministry of Education Scholarship.

-

UNIVERSITY OF LIVERPOOL INTERNATIONAL COLLEGE EXCELLENCE SCHOLARSHIP

- International students

Completed a Pre-Master's at University of Liverpool International College (UoLIC)? We're offering a £5,000 fee discount off the first year of master's study to some of the highest achieving students joining one of our non-clinical master's courses from UoLIC.

-

UNIVERSITY OF LIVERPOOL INTERNATIONAL COLLEGE IMPACT PROGRESSION SCHOLARSHIPS

- International students

If you're a University of Liverpool International College student awarded a Kaplan Impact Scholarship, we'll also consider you for an Impact Progression Scholarship. If selected, you'll receive a fee discount worth £3,000 off the first year of your master's course.

-

VICE-CHANCELLOR'S INTERNATIONAL ATTAINMENT SCHOLARSHIP FOR MAINLAND CHINA

- International students
- China

Are you a high-achieving graduate from the People's Republic of China with a degree from a Chinese university? You could be eligible to apply for a £5,000 fee discount if you're joining an eligible master's course. Up to 15 eligible students will receive this scholarship.

Entry requirements

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

Your qualification	**Requirements** About our typical entry requirements
GCSE	4/C in English and 4/C in Mathematics
Postgraduate entry requirements	We accept a 2:2 honours degree from a UK university, or an equivalent academic qualification from a similar non-UK institution. This should be in Engineering or Science with appropriate knowledge of core mechanical engineering science topics at undergraduate degree level.
International qualifications	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 University of Liverpool International College, means you're guaranteed a place on your chosen course.

THE ORIGINAL REDBRICK