Aerospace Engineering with a Year in Industry MEng

COURSE DETAILS

- A level requirements: AAA
- UCAS code: H422
- Study mode: Full-time
- Length: 5 years

KEY DATES

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

Course overview

Study Aerospace Engineering and by the end of your time at Liverpool, you will be able to show that you can now design, build, test and fly an aircraft.

INTRODUCTION

The Aerospace Engineering with a Year in Industry MEng is a four-year integrated Master's degree developed to fast-track our graduates to become Chartered Engineers either with the Institution of Mechanical Engineers or the Royal Aeronautical Society.

As an aerospace engineering student, you will experience a wide variety of topics and modes of study, whether it be conducting research, analysing reports or designing and building an aircraft.

By studying the MEng, you will develop a greater depth and breadth and specialist knowledge in core aerospace subjects than on the three year BEng degree programme. At the end of the degree you will be able to demonstrate further key skills required by employers in advanced modules such as advanced aerodynamics; advanced aerostructures; flight handling qualities; advanced guidance systems and enterprise studies.

On this **year in industry** programme, you will spend year three of this programme on a year-long placement with an approved company/organisation. During this time, you will develop work-based transferrable skills and professional competences leading to enhanced employability which will make you well placed to take up opportunities in project-based, research and management roles, both within the aerospace sector as well as other engineering industries and beyond. The year in industry is dependent upon placements being available and is subject to your performance in previous years.

WHAT YOU'LL LEARN

- Aircraft design and manufacturing
- Flight testing
- Systems engineering
- How to conduct independent research
- Aerodynamics
- Flight dynamics and control
- How to deal with complex problems that may require compromise to meet competing requirements

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ACCREDITATION

The MEng degree is recognised throughout the UK and fully satisfies the Engineering Council's academic requirements for registration as a Chartered Engineer. All of our Aerospace Engineering degree programmes are accredited, or pending accreditation, by our professional bodies, the Royal Aeronautical Society and the Institute of Mechanical Engineers and are a recognised qualification on the route to Chartered Engineer status.

Course content

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

YEAR ONE

You will study the core engineering topics that provide a firm background and understanding of aerospace engineering.

In week 7 of the second semester students take a week long course in Creo, a computer-aided design software.

COMPULSORY MODULES

INTRODUCTION TO AEROSPACE ENGINEERING (AERO110)

Credits: 7.5 / Semester: semester 1

A short module to introduce students to the language and main concepts of the aerospace engineer to provide a solid basis for the remainder of their degree programme

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.

PROFESSIONAL ENGINEERING: A SKILLS TOOLKIT (ENGG111)

Credits: 30 / Semester: whole session

This module aims to provide students with an interesting and engaging project that will help them to immediately relate the material being taught,both within and without this module, to a practical problem that is identifiable to their engineering discipline, thus reinforcing its relevance to the topixc.

The module:
1) Seeks to provide students with an early understanding of the preliminary design processes
2) Will introduce students to formal engineering drawing and visualisation
3) Will expose the students to group work and the dynamics of working in a team
4) Will expose students to the complexity of an engineering design task
5) Will enable students to develop data analysis and plotting skills
6) Will embody an approach to learning that will engage the students for the remainder of their lives
7) Seeks to provide students with an early understanding of the detail design and manufacturing process
8. Will introduce students to industry standard computer aided engineering drawing tools and practice
9. Will enable students to develop report writing and oral presentation skills
10. Will provide students with a basic understanding of engineering components and mechanisms
11. Will embody an approach to learning that will engage the students for the remainder of their lives

ENERGY SCIENCE (ENGG116)

Credits: 15 / Semester: whole session

To develop an understanding of the basic principles of fluid mechanics, the laws of thermodynamics, and an appreciation of how to solve simple engineering problems. To develop skills in performing and reporting simple experiments.

ENGINEERING MATHEMATICS (ENGG198)

Credits: 22.5 / Semester: whole session

To provide a basic level of mathematics including calculus and extend the student’s knowledge to include an elementaryintroduction to complex variables and functions of two variables.

DIGITAL ENGINEERING (ENGG125)

Credits: 15 / Semester: whole session

Students completing the module should be able to understand simple computer programs and write their own simple MATLAB programs to solve problems and process data as required by other modules and in engineering practice.
Students completing the module will be able to understand simple electrical circuits with passive and active components, mechanical (mass-spring-damper) systems and electromechanical systems (DC machines). They will learn basic mathematical, practical and computational methods for analysing and modelling these.

INTRODUCTION TO ENGINEERING MATERIALS (MATS105)

Credits: 15 / Semester: whole session

To provide students with a basic introduction to various classes of engineering materials, their mechanical properties, deformation and failure and how the properties structure and processing can be controlled to design materials with desired properties for various engineering applications.

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

YEAR TWO

You will continue to study the core engineering topics as well as taking part in a two-day flight test course in the national flying laboratory aircraft.

Students undertaking Aerospace Engineering programmes will be required to wear safety shoes or boots (both toe cap and midsole protection **must conform** to European safety legislation) for some activities, and these must be provided by the students themselves.

Students are required to participate in the Flight Test Course and marks will contribute to **AERO212** and **AERO215** modules.

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.

AEROSPACE ENGINEERING DESIGN 2 (AERO220)

Credits: 15 / Semester: whole session

Aircraft design is a complex process and requires knowledge and skills in a number of topics, e.g. aerodynamics, structures, materials, flight mechanics and control. The module will look at these topics relating to the components of full aircraft, e.g. mass distribution, aerodynamic surface sizing, fuselage, landing gear, etc. This module explains the different stages of this multi-disciplinary process: Configuration Selection; Conceptual Design; Preliminary Design. The module describes each of these processes and provides analytical engineering tools to allow the students to complete a project to the Preliminary Design.

AIRCRAFT PERFORMANCE (AERO212)

Credits: 7.5 / Semester: semester 1

To acquaint students with the fundamentals of the performance of fixed-wing aircraft; to develop from first principles the theory required to formulate and solve representative performance problems; to discuss the limitations of the theory; to introduce students to the basics of aircraft stability.

AVIONICS AND COMMUNICATIONS SYSTEMS (AERO250)

Credits: 15 / Semester: semester 2

Introduction to aerospace communications and avionic systems for Aerospace Engineering and Avionics/Aerospace Electronics students.

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.

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.

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.

ENGINEERING MATHEMATICS AND COMPUTING (ENGG295)

Credits: 15 / Semester: whole session

Engineering Mathematics and Computing will provide fundamental understanding of mathematical techniques used to solve Mechanical and Aerospace Engineering problems, as well as the associated implementation of these techniques in Matlab. Successful completion of this module will provide students with basic skills to further develop existing and devise new solution methodologies in a variety of engineering applications. The module will expose essentials of numerical solution of nonlinear algebraic equations, matrix linear algebra techniques, discrete transforms, as well as elements of ordinary and partial differential equations. A series of classic engineering model problems, such as the mass-spring damper, 2D trajectory calculation, computation of boundary layer velocity profiles and calculation of Strouhal number in the wake of a cylinder or an airfoil will place the acquired knowledge in an engineering context relevant to the Syllabus on offer at the Mechanical and Aerospace Department.

YEAR IN INDUSTRY

A life-changing experience highly valued by employers. You will be supported in finding and applying for a placement in an organisation which could range from a local small/medium-sized enterprise to a global blue chip engineering company. As with summer placements, it's up to you.

WHAT ARE THE BENEFITS OF TAKING A YEAR IN INDUSTRY?

- Develop the key skills and experiences engineering employers are looking for
- Experience first-hand the relationship between academic theory and work-place practice
- Understand and clarify your career options
- Learn about workplace culture, company organisation and management
- Earn money whilst you study.

Year in industry placements must be for a minimum of 40 weeks, and must overlap with the academic year in order that assessments can be managed smoothly. The placement year includes a variety of assessments including a reflective journal based on engineering competencies associated with the Engineering Council's professional standards and learning outcomes. Overall, the placement year accounts for 10% of the overall degree classification. As year in industry placement students are acting as ambassadors for the University whilst on these paid placements, they must have performed at a high academic level in the year before the placement in order to be considered eligible, otherwise the placement year would have to be taken by suspension of studies and would not contribute towards the degree mark.

Students normally go on their year placement during their third year of study (after successful completion of two years), although for MEng students it can be undertaken after completion of three years of study.

Applicants should note that industrial placements are highly sought after and competition to be accepted into one can be significant. They therefore cannot be guaranteed. Students who fail to secure a suitable placement offer will transfer back to the standard version of the programme without a year in industry.

Year in industry students are expected to achieve a 1st or 2:1 class degree.

COMPULSORY MODULES

SCHOOL OF ENGINEERING YEAR IN INDUSTRY (ENGG299)

Credits: 120 / Semester: whole session

This module is associated with the placement year of the 'year in industry' programme. On accepting an approved offer, students spend a minimum of 40 weeks employed in a company/organisation. Placements will be approved and arranged at places accessible to the individual student. An academic mentor will be assigned to monitor and assess the student's progress during placement. This will involve at least one site visit and follow-up telephone call as well as checking that the student's placement log is being kept up to date. The placement year should be a mutually beneficial experience for both student and employer. Students will be given opportunities and gain confidence to apply theories and technical skills learned in Years 1 and 2 of their studies in a real-time work environment. Ideally (depending on the placement), these activities will be engineering/industry relevant and project (team) based extending over several months and will therefore provide opportunities to develop the student's transferable skills and professional competence leading to enhanced employability.

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

YEAR FOUR

During your fourth year you will undertake an individual project. This provides you with the opportunity to conduct independent research and/or develop innovative concepts in your preferred technical area of interest.

COMPULSORY MODULES

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.

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.

AEROSPACE ENGINEERING DESIGN 3 (AERO321)

Credits: 15 / Semester: whole session

Aircraft design is a complex process and requires knowledge and skills in a number of topics, e.g. aerodynamics, structures, materials, flight mechanics and control. Starting with a pre-completed customer brief, students on this course will build upon the methods of Year 2 Design course and proceed with an advanced Conceptual Design of the vehicle. This will include the use of analysis tools and the creation of a simple simulation model of the aircraft. The module will be taught largely in lecture format but is supported by pc-based laboratory support sessions.

AEROSTRUCTURES (AERO318)

Credits: 15 / Semester: whole session

Aerostructures for aerospace engineering

FLIGHT DYNAMICS AND CONTROL (AERO317)

Credits: 15 / Semester: whole session

The module introduces key techniques and concepts used in the analysis of the trim, stability, and dynamic response characteristics of conventional fixed-wing aircraft. It builds on the point-performance theory taught in year two, but whereas in the latter, point mass models suffice, it now becomes necessary formally to treat rigid-body motion in three dimensions; this is done by introducing angular momentum, rotating frames of reference, and the Newton-Euler equations.
Notions of trim and of static and dynamic stability are introduced using various simplified reduced degree-of-freedom models, axis systems, and state and control variables. The standard six degree-of-freedom (6-DOF) equations of motion of a rigid aeroplane are developed; it is shown how these can be solved numerically to enable accurate flight simulation, and how they can be linearized. The relationship between the linearizations and the aircraft's natural modes is studied. Also introduced are a several important feedback control design methods, useful for modifying and improving aircraft stability and control characteristics. These include the Root Locus, Bode and Nyquist based design methods, and gain and phase margins as design goals. PID control and compensator design are also presented. Also discussed are linear state-space methods.

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%).

AERODYNAMICS (AERO306)

Credits: 7.5 / Semester: semester 1

To provide students with an understanding of aerodynamic theories including hierarchy of aerodynamic models, basics of boundary layer theory, potential flow theory, thin airfoil theory and the generation of lift, lifting line theory.

COMPUTATIONAL FLUID DYNAMICS (ENGG319)

Credits: 7.5 / Semester: semester 2

Computational fluid dynamics tools have become ubiquitous in engineering practice to design trains, planes and automobiles, to analyse the fluid flow in power generation systems and in heating, ventilation and air conditioning, and many more applications. The module will provide students with the skills to use computational fluid dynamics tools with confidence with an understanding of the underlying theory and technology.

OPTIONAL MODULES

AVIONIC SYSTEMS DESIGN (AERO350)

Credits: 7.5 / Semester: semester 2

Avionics includes pretty much all of the electrical sensors and systems that are present on modern aircraft. The aim of tbis module is to provide the opportunity for students to apply their knowledge and creative skills to design and evaluate a practical design solution to meet a given requirement and to further develop their team-working and presentation skills. The module includes 5 weeks lectures to review the fundamentals of avionic systems, and 5 week group project to study/design one of the following 3 avionic systems:i) Instrument Landing System (ILS) ii) Automated Direction Finding (ADF)iii) Distress Frequency Monitoring

RF ENGINEERING AND APPLIED ELECTROMAGNETICS (ELEC311)

Credits: 7.5 / Semester: semester 1

This module will introduce students to the fundamental concepts of high frequency electromagnetics, and circuit design techniques that must be considered in the design of high frequency circuits and systems.

Students will learn in-depth knowledge of transmission lines, the Smith Chart, standing waves and scattering parameters etc.

After this module, students will be able to appreciate the microwave and RF circuit design for contemporary communication systems.

ROTORCRAFT FLIGHT (AERO314)

Credits: 7.5 / Semester: semester 2

The module will introduce the common types of rotorcraft configuration, and will cover the basic theory of helicopter performance and flight dynamics. It will explain how rotorcraft behave in flight, and the roles of some of the main constituent components. The lectures will explain how basic physical and mathematical principles (e.g. fluid mechanics, dynamics, differential equations) can be applied to the analysis of helicopter flight. There is also some discussion of other rotary wing types such as the tilt-rotor and the autogyro.

SPACEFLIGHT (AERO319)

Credits: 7.5 / Semester: semester 1

An introduction to the main concepts of space flight is provided, including princples of space propulsion, space launch vehicles and orbital mechanics of spacecraft.

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.

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.

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

YEAR FIVE

During this year you will work towards demonstrating you knowledge and understanding as part of the year four Capstone Design Project.

COMPULSORY MODULES

FURTHER AEROSTRUCTURAL ANALYSIS (AERO417)

Credits: 7.5 / Semester: semester 1

Structural analysis forms the basis behind structural design in the aerospace industry. The module builds on basic knowledge of linear elasticity to introduce physical phenomena relevant to real-life structural design, as well as demonstrating applications to practical problems. The module proceeds to put this knowledge in the context of advanced computational analysis methods relevant to aerospace, automotive and the wider engineering sectors. The module will also provide skills in operating industry-standard simulation software, as well as first-hand experience in coding simple solutions to structural problems.

AEROELASTICITY (AERO415)

Credits: 7.5 / Semester: semester 2

This module is about the theories of structural vibration, steady and unsteady aerodynamics, and static and dynamic aeroelasticity.

AEROSPACE CAPSTONE GROUP DESIGN PROJECT (AERO420)

Credits: 30 / Semester: whole session

This module is the culmination of your Aerospace Engineering degree. It allows you to demonstrate all that you have learned as applied to an aircraft design project. You will work in a small team to satisfy an aircraft design proposal. You will start with a conceptual design exercise and then move into a more detailed design phase of activity. The ultimate demonstration of your aircraft's capabilities comes with a flight test exercise either in the School of Engineering's flight simulation facility or in hardware for small unmanned air system projects. The design exercise is marked using group-based coursework assessments which are moderated by a webPA exercise.

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.

FLIGHT HANDLING QUALITIES (15CR) (AERO401)

Credits: 15 / Semester: semester 1

This module covers the fundamentals of Flight Handling Qualities for both fixed and rotary wing aircraft. Students will work in groups to assess handling qualities of different aircraft. The module adopts a Problem Based Learning approach and contains a number of lectures, desktop modelling and flight simulator sessions. The module is assessed through a group presentation and final report, both of which will contain an element peer assessment for the final mark.

ADVANCED FLUID MECHANICS AND AERODYNAMICS (AERO406)

Credits: 15 / Semester: semester 1

To reinforce and deepen the students' understanding of:

— the mathematical description of fluid kinematics.

— the physical laws expressed by the equations of fluid motion.

— the assumptions associated with particular limits of the equations of fluid motion.

— simple exact solutions of the equations of motion.

— the differences between laminar and turbulent flow.

— the origins of laminar-turbulent flow transition

— the physics of turbulence

— the need for turbulence modelling and fundamental concepts of turbulence modeling.

To introduce students to advanced concepts in potential flow theory building upon existing knowledge of:
— the analytical generation of inviscid flow over two-dimensional objects using elementary potential flows.
— the mathematical description of potential flow from the incompressible to the supersonic regime.
— the analytical calculation of resulting forces and moments on lifting surfaces.
— the numerical computation of aerodynamic properties using panel methods
— the numerical computation of flow properties using the Method of Characteristics in compressible potential flow

To introduce students to:

— the mathematical nature of different classes of partial differential equations and the implications for their numerical solution.

— the concept of scientific computing and its basic elements: solution of linear and nonlinear systems, eigenvalue problems, differentiation and integration.

To enable student to:

— solve simple fluid mechanics problems in Matlab and analyze the results.

— recognise the capabilities and weaknesses of CFD.

— choose appropriate levels of CFD analysis for a specific problem.

— use a suitable CFD package, including meshing and setting up a simulation.

— solve laminar and turbulent flow examples using a CFD package and analyze the results.

OPTIONAL MODULES

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 4TH YEAR RESEARCH PROJECT (ENGG443)

Credits: 15 / Semester: whole session

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

ADVANCED GUIDANCE SYSTEMS (AERO430)

Credits: 7.5 / Semester: semester 2

In this module students develop an understanding of the use of advanced guidance laws in autonomous air systems, including the interactions of airframe dynamics, sensors and control surfaces.

DESIGN FOR ENVIRONMENT, MANUFACTURE AND ASSEMBLY (MNFG413)

Credits: 7.5 / Semester: semester 2

The aim of this module is to provide an introduction to the tools and methods of Eco-design, Design for Manufacture and Assembly using real, everyday products as examples.

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.

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.

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.

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 input and models, 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.

STRUCTURAL OPTIMISATION (ENGG414)

Credits: 7.5 / Semester: semester 2

This module is about classical optimisation and modern optimisation and their numerical methods. Structural optimisation and their numerical methods. Students will get an idea of how to optimise simple structure and get optimal solutions by analytical and numerical methods.

SPACE MISSION DESIGN (AERO419)

Credits: 15 / Semester: semester 2

Astrodynamics is an exciting field for students from multiple disciplines, for those interested in space mission design, in planetary science, in applied mathematics, in computer science and mission control. On completion of this module, students will understand the advanced numerical concepts and techniques for space mission design, navigation and operations. Fundamental skills for those who are interested in job roles as Flight Dynamics Engineers, Space System Engineers, Mission Analysts and Researchers

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

HOW YOU'LL LEARN

We are leading the UK's involvement in the international Conceive-Design-Implement-Operate (CDIO) initiative – an innovative educational framework for producing the next generation of engineers.

Our degree programmes encompass the development of a holistic, systems approach to engineering. Technical knowledge and skills are complemented by a sound appreciation of the life-cycle processes involved in engineering and an awareness of the ethical, safety, environmental, economic, and social considerations involved in practicing as a professional engineer.

You will be taught through a combination of face-to-face teaching in group lectures, laboratory sessions, tutorials, and seminars. Our programmes include a substantial practical component, with an increasing emphasis on project work as you progress through to the final year. You will be supported throughout by an individual academic adviser.

HOW YOU'RE ASSESSED

Assessment takes many forms, each appropriate to the learning outcomes of the particular module studied. The main modes of assessment are coursework and examination. Depending on the modules taken, you may encounter project work, presentations (individual and/or group), and specific tests or tasks focused on solidifying learning 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

As a graduate of aerospace engineering, you will be equipped with the skills to work in the development and maintenance of aircraft, satellites, and space vehicles.

Typical types of work our graduates have gone on include:

- Airline operators
- Armed forces,
- Government research agencies like the Ministry of Defence (MoD)

Recent employers of our graduates are from the following industries and companies:

- Engineering and Infrastructure: ABB Ltd, Bentley, Metronet Rail, Rolls Royce;
- Utilities: United Utilities;
- Defence and Military: BAE Systems, British Army, RAF (Royal Air Force), Royal Navy;
- Aviation: British Airways;
- Government organisations: National Nuclear Laboratory (Government-owned).

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	£9,250
Year in industry fee	£1,850
Year abroad fee	£1,385

International fees	
Full-time place, per year	£27,200
Year in industry fee	£1,850
Year abroad fee	£13,600

Fees shown are for the academic year 2024/25. Please note that the Year Abroad fee also applies to the Year in China.

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 paying for your studies..

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.

SCHOLARSHIPS AND BURSARIES

We offer a range of scholarships and bursaries to provide tuition fee discounts and help with living expenses while at university.

Check out our Liverpool Bursary, worth up to £2,000 per year for eligible UK students. Or for international students, our Undergraduate Global Advancement Scholarship offers a tuition fee discount of up to £5,000 for eligible international students starting an undergraduate degree from September 2024.

Discover our full range of undergraduate scholarships and bursaries

Entry requirements

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

Your qualification	**Requirements** About our typical entry requirements
A levels	AAA including Mathematics and a second science. Applicants with the Extended Project Qualification (EPQ) are eligible for a reduction in grade requirements. For this course, the offer is **AAB** with **A** in the EPQ. You may automatically qualify for reduced entry requirements through our contextual offers scheme.
GCSE	4/C in English and 4/C in Mathematics
Subject requirements	Mathematics and a second science. 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). Accepted Science subjects are Biology, Chemistry, Computing, Economics, Electronics, Environmental Science, Further Mathematics, Geography, Geology, Human Biology, Physics and Statistics. For applicants from England: For science A levels that include the separately graded practical endorsement, a "Pass" is required.
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.

Your qualification	Requirements [About our typical entry requirements]()
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
International qualifications	Many countries have a different education system to that of the UK, meaning your qualifications may not meet our direct entry requirements. Although there is no direct Foundation Certificate route to this course, completing a Foundation Certificate, such as that offered by the University of Liverpool International College, can guarantee you a place on a number of similar courses which may interest you.

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.

THE ORIGINAL REDBRICK