

Aerospace Engineering

 BEng (Hons)

COURSE DETAILS

- A level requirements: [AAB](#)
- UCAS code: H425
- Study mode: Full-time
- Length: 3 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

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. You will have the opportunity to study a wide range of topics during your time at Liverpool such as aerodynamics, aerostructures, flight dynamics and control, propulsion systems, avionics, aerospace materials and aircraft design.

Aerospace engineers design, analyse, build, test and maintain vehicles, their sub-assemblies and components as well as their associated systems that fly. Flight is not limited to simply within the Earth's atmosphere, and can also be outside of it.

Conducting independent research as part of an individual project will provide you with the knowledge to develop innovative concepts in your preferred technical area of interest. 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.

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

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 early understanding of the preliminary design processes including engineering drawing/visualisation, data analysis, computer aided engineering. It includes a team project and develops report writing and oral presentation skills. It also introduces vital topics of engineering sustainability and engineering ethics. It develops student ability to reflect upon and record their learning and development.

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

ENGG198 is a Year 1 mathematics module for students of programmes taught in the School of Engineering, e.g. Aerospace, Civil, Architectural, Mechanical, Product Design and Industrial Design Engineering. It is designed to reinforce and build upon A-level (or equivalent) mathematics, providing you with the strong background required in your engineering studies and preparing you for Year 2 mathematics modules.

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.

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.

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.

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.

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.

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 module student undertake a group "virtual project" in which they undertake all stages of project management involved in 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 a fundamental understanding of mathematical techniques used to solve Engineering problems. Successful completion of this module will provide students with basic skills and solution methodologies (mathematical, and using MATLAB) for various engineering applications. The module will expose the essentials of numerical methods to solve systems of linear, non-linear, ordinary and partial differential equations. A series of classic engineering problems, such as trusses, mass-spring dampeners, 2D trajectory calculation, and 2D heat flow will place the acquired knowledge in an engineering context.

FLIGHT MECHANICS (AERO202)

Credits: 15 / Semester: whole session

This module acquaints students with performance analysis of fixed-wing aircraft, including analysis of aircraft range and endurance, climb performance, and take-off and landing distance. Students will also learn about methods to analyse the static stability of fixed-wing aircraft in different conditions. To complement the study of fixed-wing aircraft, students will also learn about the anatomy and fundamental physics of conventional helicopters.

ENGINEERING MATERIALS PROCESSING & SELECTION (MATS201)

Credits: 15 / Semester: semester 2

This module introduces the main processing and manufacturing techniques used to make metallic, ceramic, polymer and composite materials. The students will learn and appreciate how the microstructure and properties of materials are impacted by the processing methods. The students will also learn how to derive materials performance indices and select appropriate materials for a given situation.

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.

YEAR THREE

During your third 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 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: semester 2

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. Also introduced are a several important feedback control design methods, useful for modifying and improving aircraft stability and control characteristics, including Root Locus, Bode and Nyquist based design methods for PID control. As part of the module, students will undertake a flight test course in the National Flying Laboratory Centre to assess the performance and stability qualities of a real aircraft in flight.

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 (AERO316)

Credits: 15 / Semester: semester 1

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

COMPUTATIONAL METHODS IN ENGINEERING (ENGG386)

Credits: 15 / Semester: whole session

Finite element analysis and computational fluid dynamics tools have become ubiquitous in engineering practice to design trains, planes and automobiles, to analyse the structural mechanics of gears, shafts, bridges and skyscrapers and 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 finite element analysis and computational fluid dynamics tools with confidence with an understanding of the underlying theory and technology, and limitations thereof.

OPTIONAL MODULES

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 principles of space propulsion, space launch vehicles and orbital mechanics of spacecraft.

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

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).

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

Graduate Outcomes, 2018-19.

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	£9,535
Year in industry fee	£1,850
Year abroad fee	£1,385

International fees	
Full-time place, per year	£29,100
Year in industry fee	£1,850
Year abroad fee	£14,550

The UK full-time tuition fee, international course fee and fee for the year abroad for international students shown are correct for 2025/26 entry. We are currently awaiting confirmation of whether the year abroad fee for UK students, as well as the year in industry fee will change, so the fees shown are for 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 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

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 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](#)

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UNDERGRADUATE GLOBAL ADVANCEMENT SCHOLARSHIP

- [International students](#)

[If you're a high-achieving international student starting an undergraduate degree with us from September 2024, you could be eligible to receive a fee discount of up to £5,000. You'll need to achieve grades equivalent to AAA in A levels. Most of our undergraduate degrees are eligible, with the exception of clinical programmes in Medicine and Dental Surgery.](#)

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THE LIVERPOOL BURSARY

- [Home students](#)

[If you're a UK student joining an undergraduate degree and have a household income below £35,000, you could be eligible for a Liverpool Bursary worth up to £2,000 for each year of undergraduate study.](#)

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ASYLUM SEEKERS SCHOLARSHIP

- [Home students](#)

[Apply for an Asylum Seekers Scholarship and you could have your tuition fees paid in full and receive help with study costs. You'll need to have applied for asylum in the UK, or be the dependant of an asylum seeker, and be joining an eligible undergraduate degree.](#)

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CARE LEAVERS' OPPORTUNITY BURSARY

- [Home students](#)

[If you've spent 13 or more weeks in Local Authority care since age 14, you could be eligible for a bursary of £3,000 per year of study. You'll need to be a UK student joining an eligible undergraduate degree and be aged 28 or above on 1 September in the year you start.](#)

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COWRIE FOUNDATION SCHOLARSHIP

- [Home students](#)

[Are you a UK student with a Black African or Caribbean heritage and a household income of £25,000 or less? You could be eligible to apply for a Cowrie Foundation Scholarship worth up](#)

[to £8,000 for each year of undergraduate study.](#)

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ESTRANGED STUDENTS BURSARY

◦ [Home students](#)

[If you're a UK student identified as estranged by Student Finance England \(or the equivalent UK funding body\), you could be eligible for a bursary of £1,000 for each year of undergraduate study.](#)

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GENESYS LIFE SCIENCES SCHOLARSHIP

◦ [Home students](#)

[Joining a School of Biosciences degree and have a household income of less than £25,000? If you're a UK student, you could apply to receive £4,500 per year for three years of your undergraduate course.](#)

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GRADUATE ASSOCIATION HONG KONG & TUNG UNDERGRADUATE SCHOLARSHIPS

◦ [International students](#)

◦ [Hong Kong](#)

[If you're an undergraduate student from Hong Kong who can demonstrate academic excellence, you may be eligible to apply for a scholarship worth £10,000 in partnership with the Tung Foundation.](#)

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KAPLAN DIGITAL PATHWAYS EXCELLENCE SCHOLARSHIP

◦ [International students](#)

[Completed a Kaplan Digital Pathways Foundation Certificate? We're offering a £5,000 fee discount off the first year of undergraduate study for a maximum of two high achieving students joining one of our non-clinical degrees from an online Kaplan Foundation Certificate.](#)

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NOLAN SCHOLARSHIPS

◦ [Home students](#)

[Do you live in the Liverpool City Region with a household income of £25,000 or less? Did neither of your parents attend University? You could be eligible to apply for a Nolan Scholarship worth £5,000 per year for three years of undergraduate study.](#)

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RIGBY ENTERPRISE AWARD

◦ [Home students](#)

[Are you a UK student with a household income of £25,000 or less? If you've participated in an eligible outreach programme, you could be eligible to apply for a Rigby Enterprise Award worth £5,000 per year for three years of your undergraduate degree.](#)

- **ROLABOTIC SCHOLARSHIP**

- Home students

- Are you a UK student with a household income of £25,000 or less? Did neither of your parents attend University? You could be eligible to apply for a ROLABOTIC Scholarship worth £4,500 for each year of your undergraduate degree.

- **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.

- **TECHNETIX BROADHURST ENGINEERING SCHOLARSHIP**

- Home students

- Joining a degree in the School of Electrical Engineering, Electronics and Computer Science? If you're a UK student with household income below £25,000, you could be eligible to apply for £5,000 a year for three years of study. Two awards will be available per academic year.

- **UNIVERSITY OF LIVERPOOL INTERNATIONAL COLLEGE EXCELLENCE SCHOLARSHIP**

- International students

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

- **UNIVERSITY OF LIVERPOOL INTERNATIONAL COLLEGE FIRST CLASS SCHOLARSHIP**

- International students

- We're offering a £1,000 fee discount for years 2 and 3 of undergraduate study to eligible students progressing from University of Liverpool International College. You'll need to be studying a non-clinical subject and get an average of 70% or above in year 1 of your degree.

- **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 £3,000 fee discount off the first year of your undergraduate degree.

- **YOUNG ADULT CARER'S (YAC) BURSARY**

- Home students

If you're a young adult and a registered carer in the UK, you might be eligible for a £1,000 bursary for each year of study. You'll need to be aged 18-25 on 1 September in the year you start your undergraduate degree.

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	<p>AAB 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 ABB with A in the EPQ.</p> <p>You may automatically qualify for reduced entry requirements through our contextual offers scheme.</p> <p>If you don't meet the entry requirements, you may be able to complete a foundation year which would allow you to progress to this course.</p> <p>Available foundation years:</p> <ul style="list-style-type: none">• Engineering Foundation (4 year route including a Foundation Year at Carmel College) BEng (Hons)
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: For science A levels that include the separately graded practical endorsement, a "Pass" is required.</p>
BTEC Level 3 National Extended Certificate	Acceptable at grade Distinction* alongside BB in A Level

Your qualification	Requirements About our typical entry requirements
	Mathematics and a second science.
BTEC Level 3 Diploma	Distinction* Distinction* in relevant BTEC considered alongside A Level Mathematics grade B. Accepted BTECs include Aeronautical, Aerospace, Construction, Mechanical, Mechatronics and Engineering.
BTEC Level 3 National Extended Diploma	D*DD in acceptable BTEC, plus B in A level Maths (not accepted without B in A level Maths)
International Baccalaureate	35 overall including 5 in Higher Level Mathematics and 5 in Higher Level Physics.
Irish Leaving Certificate	H1,H1,H2,H2,H2,H3, including H2 in Higher Maths and Higher Second Science. We also require a minimum of H6 in Higher English or O3 in Ordinary English
Scottish Higher/Advanced Higher	Pass Scottish Advanced Highers with grades AAB including Mathematics and a second science
Welsh Baccalaureate Advanced	Acceptable at grade B alongside AA in A Level Mathematics and a second science
Cambridge Pre-U Diploma	D3 in Cambridge Pre U Principal Subject is accepted as equivalent to A-Level grade A M2 in Cambridge Pre U Principal Subject is accepted as equivalent to A-Level grade B Global Perspectives and Short Courses are not accepted.
Access	Considered if taking a relevant subject. Check with Department or Admissions team.
International qualifications	Many countries have a different education system to that of the UK, meaning your qualifications may not meet our entry

Your qualification	Requirements About our typical entry requirements
	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.

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