

Chemical Engineering

 BEng (Hons)

COURSE DETAILS

- A level requirements: [AAA](#)
- UCAS code: H810
- Study mode: Full-time
- Length: 3 years

KEY DATES

- Apply by: [29 January 2025](#)
- Starts: 22 September 2025

Course overview

Chemical Engineers create innovative solutions to some of our world's greatest problems. They are involved in making medicines, safe water treatments, renewable energy and so much more. Our Chemical Engineering course focuses on sustainable solutions, hands-on learning, and industry experience. It will prepare you for a career in tackling global challenges.

INTRODUCTION

If you want to make a real difference in addressing the world's major challenges including sustainability, climate change, food security, and ensuring good health for all, then chemical engineering is for you. It will equip you with skills and knowledge that are in high global demand and that can really change the world! Chemical engineers play a pivotal role in how we all live, working across societies and industries worldwide to achieve the UN's Sustainable Development Goals. Chemical engineering enables you to use a unique mix of your creativity, knowledge and problem-solving skills to make our planet a better place.

Yvonne Baker OBE, CENG, MICHEME, Chief Executive Officer of the Institution of Chemical Engineers (ICHEME)

Our Chemical Engineering programme* offers an exciting blend of learning experiences, delivered by leaders in their field. Teaching the fundamentals of Chemical Engineering through a combination of lectures, laboratory sessions, tutorials and seminars equipping you with the skills, attitudes, and experience demanded by 21st century engineering and society.

You'll learn in a modern, well-equipped environment that fosters world-class digital innovation including our Active Learning Laboratories. You will also gain unique skills operating our pilot plant facility. You will join the UK professional chemical engineering community from day one because we will sign you up for student membership of the Institution of Chemical Engineers (IChemE) and cover the fees for the duration of your degree course.

Years One and Two are shaped to give you an understanding of the theory and skills needed to become a successful Chemical Engineer. As you progress into Year Three, you will focus on more advanced topics such as process safety alongside the all-important Design Project. We give you everything you need to walk out of the door to begin your professional journey toward chartered engineer.

This programme is available from September 2025, subject to approval. The modules listed are an indication of what will be studied, though may be subject to change.

*pending approval and accreditation

WHAT YOU'LL LEARN

- Underpinning science and mathematics of engineering systems
 - Advanced information technology
 - Collaborative engineering design
 - Sustainable manufacturing
 - Quantitative risk assessment and economic analysis
 - Creative problem solving and critical thinking
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ACCREDITATION

As a new programme, our Chemical Engineering courses are pending accreditation by the Institution of Chemical Engineers (IChemE). This degree has been designed in consultation with the IChemE and industry experts, and will be fully accredited (subject to approval) in 2028 as soon as students from the first cohort graduate.

This is the first step in becoming a Chartered Engineer (CEng).

Course content

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

YEAR ONE

Year one gives students the scientific principles that underpin the practice of professional chemical engineering. You'll also get a fast-track, activity-based introduction to the key principles of engineering design requiring teamwork and communication.

Compulsory modules:

- ENGG151: Chemical Engineering Design Principles 1
- ENGG152: Chemistry and Biochemistry for Engineers
- ENGG153: Soft Matter Science
- ENGG111: Professional Engineering: A Skills Toolkit
- ENGG198: Engineering Mathematics
- ENGG116: Energy Science

COMPULSORY MODULES

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 topic.

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

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 elementary introduction to complex variables and functions of two variables.

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.

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

YEAR TWO

Year two extends core principles from year one and applies them to the flagship chemical engineering topics of separations, reaction engineering and process control. This learning is reinforced with the Year Two Design Exercise. You are also given time to become proficient in industry standard process simulation software.

Compulsory modules:

- ENGG253: Separation Processes
- ENGG252: Reaction Engineering
- ENGG251: Chemical Engineering Design Principles 2
- ENGG254: Process Dynamics and Control
- ENGG255: Chemical Engineering Thermodynamics
- ENGG256: Chemical Engineering Year 2 Design Exercise
- ENGG257: Project Management and Process Operations
- ENGG295: Engineering Mathematics and Computing

COMPULSORY MODULES

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 Mechanical and Aerospace 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.

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

YEAR THREE

The major module studied in year three is the Chemical Engineering Capstone Design Project in which you will work like a team in industry to do the preliminary design of an entire process complete with hazard assessment and economic analysis to calculate payback time. You'll also study advanced key modules for creating new sustainable processes, alongside process safety: techniques that are highly sought after in industry.

Compulsory modules:

- ENGG356: BEng Chemical Engineering Design Project
- ENGG352: Process Safety and Loss Prevention
- ENGG353: Sustainable Processes
- MECH301: Heat Transfer
- MECH326: Engineering Fluid Mechanics
- ENGG354: Enterprise Skills and Project Economics
- ENGG355: Environmental Engineering

COMPULSORY MODULES

HEAT TRANSFER (MECH301)

Credits: 15 / Semester: semester 2

The aim of this module is to give the students a good understanding of the basic mechanisms of heat transfer and to equip them to solve significant engineering problems.

They will also learn about different designs of heat exchanger and how to carry out performance/design calculations.

ENGINEERING FLUID MECHANICS (MECH326)

Credits: 15 / Semester: semester 1

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

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

HOW YOU'LL LEARN

All engineering students at the University of Liverpool benefit from 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, security, 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, hands-on operation of larger scale equipment, 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

Chemical Engineering graduates have excellent employment prospects and attract some of the highest starting salaries of all the engineering disciplines. You will graduate with the technical and professional skills to pursue an exciting career in a wide range of industries, that can take you all over the world.

The average salary for early-career chemical engineers is £30,000 (source IChemE). Salaries for chartered chemical engineers can be significantly higher, for example, the average salary for chartered engineers with an undergraduate degree is around £78,500. (source: IChemE via www.prospects.ac.uk/job-profiles/chemical-engineer).

The University of Liverpool is one of the most targeted universities by top employers, according to The [Graduate Market 2024, High Fliers Research](#), meaning our graduates are in demand.

Qualifying with a Chemical Engineering degree from Liverpool will equip you with the knowledge and confidence to explore opportunities in many sectors. Modern Chemical Engineers work in a wide variety of industries including:

- Fine Chemicals and Pharmaceuticals
- Consumer Goods, Food and Drink
- Clean Energy, Hydrogen Economy, Nuclear and Sustainable Fuels
- Biotechnology, Water & Wastewater Treatment and Resource Recovery.

Our engineering graduates are also highly sought-after by other industries for their analytical, communications, management, business and IT skills. Some are thought leaders, policy makers and entrepreneurs delivering solutions in diverse areas, from treating diseases to tackling climate change.

Here, in the North-West region, there are many world-leading employers of Chemical Engineering graduates including:

- Unilever
- Heinz
- United Utilities
- Sellafield Limited
- AstraZeneca.

For more career inspiration visit www.thechemicalengineer.com/tags/career-paths/.

£78,500 IS THE AVERAGE SALARY FOR CHARTERED CHEMICAL ENGINEERS.

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

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	<p>AAA</p> <p>Narrowly missed the entry requirements on results day?</p> <div data-bbox="466 703 1441 797" style="border: 1px solid #ccc; padding: 5px; text-align: center;">If you've studied these subjects, we may take them into account.</div> <p>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.</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	Maths, Chemistry and one additional subject.
International qualifications	<p>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.</p>

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