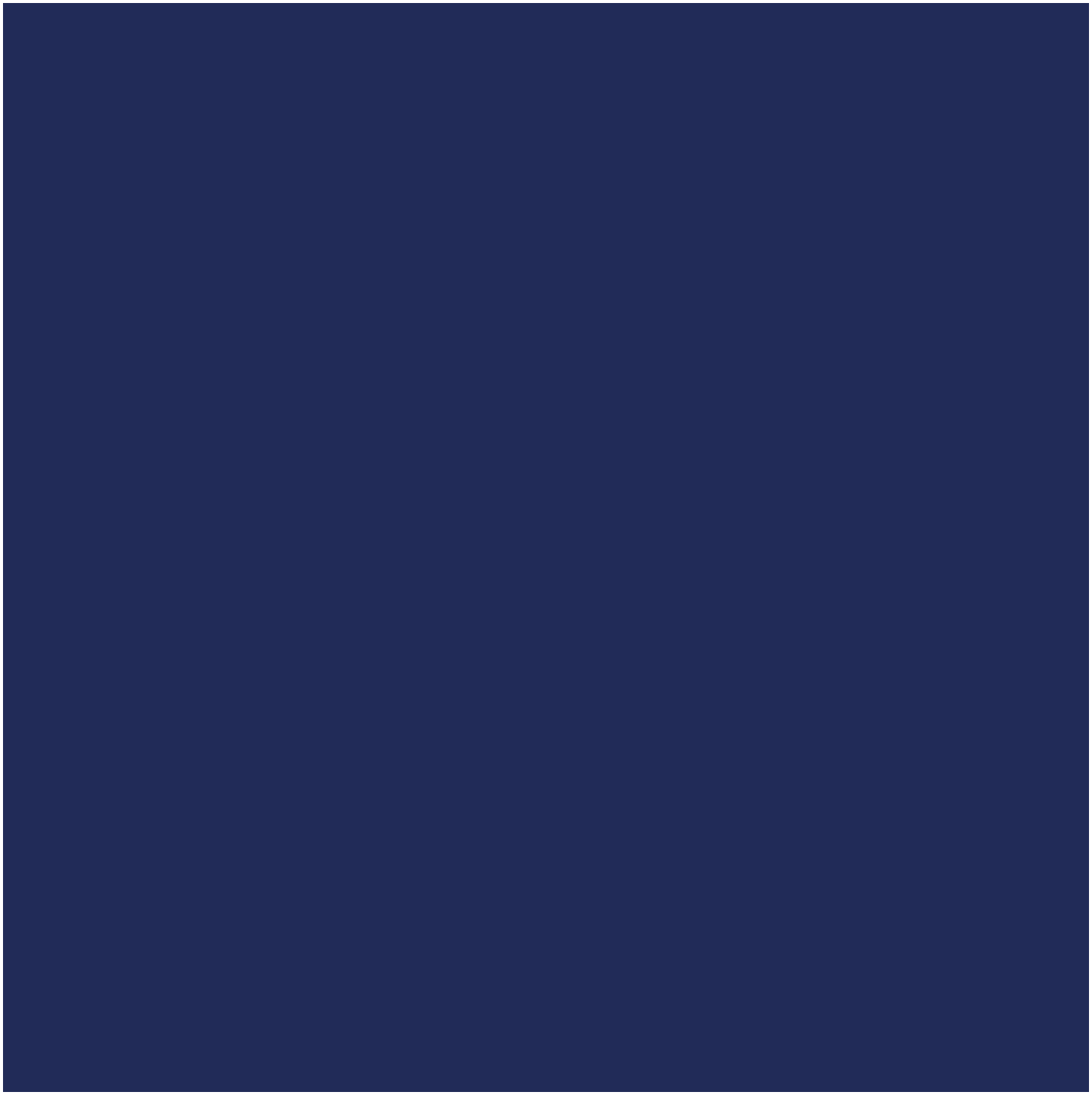
UNIVERSITY OF LIVERPOOL

MSc

Chemistry for Sustainable Energy with AI

Study mode	Duration	
Full-time	12 months	Apply by: **28 August 2026** Starts on: **21 September 2026**



Join us at Postgraduate Online Open Week

Meet us online this November to find out more about this course and all of our master's degrees and research opportunities.

Register now

About this course

One of the major challenges we face today is transitioning to clean and sustainable energy sources that will help tackle climate change.
This programme combines cutting-edge digital techniques with expert knowledge to address the global challenge of sustainable energy.
Students will develop advanced skills and knowledge that prepare them for innovative professional practice or doctoral-level study.

Introduction

Chemistry is crucial to many technologies that reduce carbon emissions and support the shift to low-carbon energy. Chemists play a crucial role in driving innovation in areas such as batteries and energy storage, fuel cells, renewable energy, nuclear power, hydrogen, and carbon capture. AI can help speed up the discovery of new energy systems more efficiently.

Whilst studying this programme you will benefit from the expertise of the Stephenson Institute for Renewable Energy, a leading research institute in energy materials, aiming to transform the future of energy generation, storage, transmission and energy efficiency.

You'll gain exclusive access to the £81M Materials Innovation Factory – a world-class centre for AI-driven chemistry, automation, and robotics. Hands-on learning takes place in the Central Teaching Laboratory, where state-of-the-art facilities support

teaching in chemistry lab automation – from building simulation environments to programming robots for real experiments.

The programme fosters strong industry connections, enabling students to build professional networks and gain real-world insights. Learning is strengthened through authentic assessments that mirror workplace scenarios, ensuring graduates develop practical, industry-relevant skills.

Choose this exciting new MSc and be at the frontier of the future of clean energy.

Who is this course for?

This programme is designed for UK BSc (Hons) Chemistry, Chemical Engineering, or Chemistry-related degree graduates with a 2.2 or equivalent.

What you'll learn

Students will learn how to demonstrate knowledge and understanding of programming and data analysis to apply in the field of chemistry and sustainable energy.

Back to top

Course content

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

Semester one

Modules

Compulsory modules	Credits
PROGRAMMING FUNDAMENTALS (COMP517)	15
MATHS AND STATISTICS FOR AI AND DATA SCIENCE (COMP533)	15
NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY (CHEM471)	7.5
KEY SKILLS FOR DIGITAL CHEMISTRY (CHEM503)	15

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

Semester two

Modules

Compulsory modules	Credits
RESEARCH PROJECT PLANNING AND MANAGEMENT IN DIGITAL CHEMISTRY (CHEM506A)	30
CHEMICAL DATA, DISCOVERY AND DESIGN (CHEM502)	15

Compulsory modules	Credits
THE PHYSICS OF RENEWABLE ENERGY AND ELECTRONIC DEVICES (PHYS312)	15

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

Research project

Modules

Compulsory modules	Credits
MSC DIGITAL CHEMISTRY RESEARCH PROJECT (CHEM506B)	60

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

Teaching and assessment

How you'll learn

- Subject-specific and transferrable skills are developed through the teaching approaches utilised in the modules, including interactive lectures, workshops, practical sessions and a research project, all supported by online materials, selected textbooks and specific literature. The programme modules encourage individual and group work where students tackle problems by developing ideas and hypotheses, designing strategies to solve problems, and analysing and interpreting their findings.
- As students advance through the course, they initially engage with taught modules during semesters 1 and 2 laying the groundwork for their forthcoming research project. The content of semester 2 modules is linked to that of semester 1. This sequential structure is designed to support all students, irrespective of their academic background in Chemistry, Chemical Engineering, or Chemistry-related degrees, ensuring they can establish a robust foundation for further advanced study.

- Liverpool Curriculum Framework attributes and hallmarks are at the centre of this programme, and it is also informed by the University Education Strategy 2031. Research-connected teaching, active learning and authentic assessment are embedded in all aspects of teaching. As students progress through the programme, they will enhance their problem-solving skills, independent learning, confidence and digital fluency. Inclusivity is at the heart of this programme, encompassing all aspects of equality, diversity and inclusion as part of value-based programme design. The programme is representative of the diversity of students and provides equal access to the curriculum for each of them.
- Electronic resources available in the University's virtual learning environment and library collections support learning and teaching on this programme.

How you're assessed

The learning activities, resources and tasks (e.g. formative or summative assessments) are aligned to the learning outcomes so that students undertaking these tasks will be able to demonstrate their knowledge and ability in relation to the learning outcomes. Many assessments are authentic, meaning students will engage in the simulation of real-world scenarios in hands-on, workshop and project-driven assessments to demonstrate their ability to apply digital technologies and address challenges in chemistry.

Assessment strategies will ensure that students can demonstrate their knowledge and skills through various methods, e.g. coursework, teamwork, presentation, dissertation writing, oral examination, etc.

All modules will provide formative feedback to students on their learning progress and allow for adjustment of their learning. Students also evaluate their progress, are guided to extra information, and are supported via online resources and formative exercises.

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.

The Liverpool Curriculum framework sets out our distinctive approach to education. Our teaching staff support our students to develop academic knowledge, skills, and understanding alongside our **graduate attributes**:

- Digital fluency

- Confidence
- Global citizenship

Our curriculum is characterised by the three **Liverpool Hallmarks**:

- Research-connected teaching
- Active learning
- Authentic assessment

All this is underpinned by our core value of **inclusivity** and commitment to providing a curriculum that is accessible to all students.

Back to top

Careers and employability

According to Deloitte, the chemical industry is involved in 96% of all manufactured goods worldwide, and they predict that the chemical industry is expected to focus on innovation, sustainability, and resiliency to drive efficiency and growth.

Occupations linked to students who have studied chemistry in a higher education setting are set to grow across the UK. There is an anticipated growing demand for adaptable scientists who can harness the knowledge and skillsets of digital chemists, and who can help to tackle some of the global challenges we face today.

By combining chemistry, sustainability, and AI, you can choose to work in multiple rapidly evolving areas such as:

- Energy systems engineering.
- Materials science
- Computational Chemistry
- Pharmaceuticals
- Green tech companies and AI-powered research labs
- Research and Development

Many of our students also go on to academia and advanced research.

Possible careers include:

- Materials Scientist
- Computational Chemist
- Data Analyst
- Energy Consultant
- Battery Research Scientist
- Green Chemistry Engineer
- Product Manager

Career support from day one to graduation and beyond

Career planning

From education to employment

Networking events

Back to top

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 - £14,000

International fees

Full-time place, per year - £32,000

Tuition fees for the academic year 2026/27 will be announced soon.

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 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 could include buying a laptop, books, or stationery.

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

Back to top

Entry requirements

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

Postgraduate entry requirements

We accept a 2:2 honours degree from a UK university. This degree should be in Chemistry, Chemical Engineering, or a Chemistry-related degree.

International candidates' minimum entry requirements are equivalent to the UK BSc (Hons) Chemistry, Chemical Engineering, or Chemistry-related degrees 2.2.

International qualifications

Select your country or region to view specific entry requirements.

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.

English language requirements

You'll need to demonstrate competence in the use of English language, unless you're from a majority English speaking country.

We accept a variety of international language tests and country-specific qualifications.

International applicants who do not meet the minimum required standard of English language can complete one of our Pre-Sessional English courses to achieve the required level.

IELTS

6.5 overall, with no component below 6.0

TOEFL iBT

88 overall, with minimum scores of listening 19, writing 19, reading 19 and speaking 20

Duolingo English Test

120 overall, with no component below 105

Pearson PTE Academic

61 overall, with no component below 59

LanguageCert Academic

70 overall, with no skill below 65

PSI Skills for English

B2 Pass with Merit in all bands

INDIA Standard XII

National Curriculum (CBSE/ISC) - 75% and above in English. Accepted State Boards - 80% and above in English.

WAEC

C6 or above

Pre-sessional English

Do you need to complete a Pre-sessional English course to meet the English language requirements for this course?

The length of Pre-sessional English course you'll need to take depends on your current level of English language ability.

Pre-sessional English in detail

If you don’t meet our English language requirements, we can use your most recent IELTS score, or the equivalent score in selected other English language tests, to determine the length of Pre-sessional English course you require.

Use the table below to check the course length you're likely to require for your current English language ability and see whether the course is available on campus or online.

Your most recent IELTS score	Pre-sessional English course length	On campus or online
6.0 overall, with no component below 6.0	6 weeks	On campus
6.0 overall, with no component below 5.5	10 weeks	On campus and online options available
6.0 overall, with no more than one component below 5.5, and no component below 5.0	12 weeks	On campus and online options available
5.5 overall, with no more than one component below 5.5, and no component below 5.0	20 weeks	On campus
5.0 overall, with no more than one component below 5.0, and no component below 4.5	30 weeks	On campus
4.5 overall, with no more than one component below 4.5, and no component below 4.0	40 weeks	On campus

If you’ve completed an alternative English language test to IELTS, we may be able to use this to assess your English language ability and determine the Pre-sessional English course length you require.

Please see our guide to Pre-sessional English entry requirements for IELTS 6.5 overall, with no component below 6.0, for further details.

Back to top

Generated: 22 Oct 2025, 08:00