UNIVERSITY OF LIVERPOOL

MSc (Eng)

Energy and Power Systems

Study mode	Duration	
Full-time	12 months	Apply by: **29 August 2025** Starts on: **22 September 2025**

About this course

This programme provides you with an in-depth knowledge of electrical power generation, transmission, distribution and networks. We also explore the operating principles, monitoring, optimisation and control of modern power systems in detail.

Introduction

The world demand for energy, in particular electricity, is increasing significantly and will continue to do so over the next decade and beyond. There are many challenges to be addressed in order to meet this ever-increasing demand, and electrical and electronic engineers are needed to provide key solutions. There are significant opportunities for you to make an impact that will shape the future, and this programme has been carefully designed with this in mind.

Developed with industry partners, this master's course addresses environmental challenges, renewable energy generation, smart grid, high voltage power engineering, and research and management skills. In addition, you will experience site visits and practical sessions.

Please note: We regularly review and develop our postgraduate programmes. This MSc is also available with the alternative title Renewable and Sustainable Energy MSc (Eng) for September 2025 entry, and gives students the option to graduate with either of these two MSc titles.

Who is this course for?

The programme has been carefully developed for graduates with electrical/electronic or related backgrounds to meet the increasing demand from the energy and power industry to provide solutions to challenges in the sector.

What you'll learn

- You will develop the knowledge, skills and competencies (as defined by UK-SPEC) needed to pursue a successful professional career in energy and power systems engineering that meet the needs of industry and society
- You will gain a sound understanding of energy and power systems principles, broad knowledge of technical and non-technical subjects and skills to practice energy and power systems engineering and develop your career to any scientific, technical or managerial level worldwide
- You will attain a level of competence and experience that satisfy the academic requirements for a Chartered Engineer (CEng).

Accreditation

Accredited by the Institution of Engineering and Technology on behalf of the Engineering Council as meeting the requirements for Further Learning for registration as a Chartered Engineer. Candidates must hold a CEng accredited BEng/BSc (Hons) undergraduate first degree to comply with full CEng registration requirements.

Accreditation in detail

IET

IET are one of the world's leading professional societies for engineers and technicians and their accreditation covers a whole range of subjects including electrical, electronic, manufacturing, mechanical, systems and software engineering, as well as bioengineering, nanotechnology and renewable energy.

It’s recognised globally as an indicator of quality through the Washington and Sydney accords, which are governed by the International Engineering Alliance (IEA).

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Course content

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

Semester one

In your first semester, compulsory modules will introduce you to a range of electrical machines using the concepts of rotating magnetic fields, popular programming languages such as C++ and MATLAB, and the dynamic behaviour of power systems.

You'll learn the research skills you'll need to complete your final project – along with an understanding of measurement and monitoring and the sensors that are used in power systems and design techniques for digital and embedded computer systems.

Optional modules will allow you to explore the principles of communications networks, protocols and security mechanisms, the concepts of electrical plasmas and how they are used in industry, and advanced modelling, simulation and control techniques to develop your problem-solving skills.

Modules

Compulsory modules	Credits
MEASUREMENT, MONITORING AND SENSORS (ELEC421)	15
RESEARCH SKILLS & PROJECT MANAGEMENT (ELEC483)	15
DRIVES (ELEC331)	7.5
PLASMA SYSTEM ENGINEERING (ELEC491)	7.5
ENGINEERING PROGRAMMING (ELEC431)	15
POWER SYSTEMS ANALYSIS & DYNAMICS (ELEC402)	15
MOBILE COMMUNICATIONS AND SECURITY (ELEC463)	15

Optional modules	Credits
IMAGE PROCESSING (ELEC319)	7.5
ADVANCED SYSTEMS MODELLING & CONTROL (ELEC476)	15
PLASMA SYSTEM ENGINEERING (ELEC391)	7.5
ADVANCED LOW POWER COMPUTER ARCHITECTURE (ELEC470)	15
DIGITAL SYSTEM DESIGN (ELEC473)	15
DIGITAL AND WIRELESS COMMUNICATIONS (ELEC477)	15

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

Semester two

Your compulsory modules will present methods for analysing power electronic converters suitable for AC:DC, DC:DC, and DC:AC electrical energy conversion and develop a good understanding of different renewable energy sources and the principle of energy conversion from renewable sources into electricity. You'll also learn the theories, principles and test methods in relation to the operation of high-voltage power networks and electrical apparatuses.

You'll continue to develop your research skills ahead of your final project in the summer, as well as get more in-depth knowledge of monitoring systems, sensors, processors, and system design.

With optional modules, you can be introduced to the principles of communications networks, their components and protocols or develop an understanding of electromagnetic compatibility (EMC), the scope of EMC, standards, typical EMC problems and solutions.

Modules

Compulsory modules	Credits
ADVANCED POWER ELECTRONICS (ELEC433)	7.5
HIGH VOLTAGE ENGINEERING (ELEC407)	15
RENEWABLE ENERGY & SMART GRID (ELEC435)	15
MEASUREMENT, MONITORING AND SENSORS (ELEC421)	15
RESEARCH SKILLS & PROJECT MANAGEMENT (ELEC483)	15

Optional modules	Credits
COMMUNICATIONS NETWORKS (ELEC461)	15
ELECTROMAGNETIC COMPATIBILITY (ELEC382)	7.5
ADVANCED LOW POWER COMPUTER ARCHITECTURE (ELEC470)	15
DIGITAL SYSTEM DESIGN (ELEC473)	15

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

Final project

Over the summer you will have the opportunity to plan, carry out and control a research project at the forefront of your academic discipline, where you will work independently to answer a research question based on your specialism area.

You'll use your research, literature searching and specific skills you have learned during the previous semesters to highlight your abilities.

You'll present an outline to your supervisor, create a interim report, and finally a dissertation.

Modules

Compulsory modules	Credits
MSC PROJECT (ELEC460)	60

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

Teaching and assessment

How you'll learn

You will learn through a mixture of formal lectures, laboratories, practicals and tutorial sessions, guided reading, student-centred learning, and project work.

How you're assessed

You will be assessed through a combination of traditional written examinations and continuous assessment, including marked laboratory reports, assignments, essays, class tests and presentations. Practical assessment is employed for both formative and summative assessment.

You will also undertake a dissertation as part of your summer project.

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.

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Careers and employability

This programme will provide you with an excellent base if you're considering a career in the electrical power industry.

Graduates from our MSc programme are employed worldwide in leading companies at the forefront of technology.

Some of our graduates have gone on to work for companies such as:

- National Grid
- Scottish Power
- State Grid (China)

Others have continued to study for a PhD programme.

Career support from day one to graduation and beyond

Career planning

From education to employment

Networking events

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Fees and funding

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

Tuition fees

UK fees (applies to Channel Islands, Isle of Man and Republic of Ireland)

Full-time place, per year - £13,300

International fees

Full-time place, per year - £29,900

Fees stated are for the 2025-26 academic year.

Tuition fees cover the cost of your teaching and assessment, operating facilities such as libraries, IT equipment, and access to academic and personal support.

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

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

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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, or an equivalent academic qualification from a similar non-UK institution. This degree should be in a relevant subject, for example Electrical Engineering and Electronics.

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 5.5

TOEFL iBT

88 overall, with minimum scores of listening 17, writing 17, reading 17, and speaking 19. TOEFL Home Edition not accepted.

Duolingo English Test

125 overall, with speaking, reading and writing not less than 105, and listening not below 100

Pearson PTE Academic

61 overall, with no component below 59

LanguageCert Academic

70 overall, with no skill below 60

PSI Skills for English

B2 Pass with Merit overall and no band below B2 Pass

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 5.5	6 weeks	On campus
5.5 overall, with no component below 5.5	10 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	12 weeks	On campus and online options available
5.5 overall, with no component below 4.5	20 weeks	On campus
5.0 overall, with 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 5.5, for further details.

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