UNIVERSITY OF LIVERPOOL

MSc (Eng)

Microelectronic Systems

Study mode	Duration	
Full-time	12 months	Apply by: **11 September 2026**
Part-time	24 months	Starts on: **28 September 2026**

About this course

On this well-established MSc programme, you will develop advanced knowledge and skills in key aspects of microelectronic systems. The course content is updated annually to maintain industry relevance and to reflect the latest developments in the industry.

Introduction

We cover the following core (compulsory) topics during the MSc: embedded computer systems, digital system design, IC design, microprocessor systems, research skills and project management.

The course content also covers digital design techniques, you will be introduced to materials used in microelectronics, and develop an understanding of designing advanced embedded computer systems – along with a module that will help you to develop the practical skills to develop your final project in semester three.

You'll be able to develop your specialism through optional modules, where you can learn the fundamentals of image processing, the principles of communications networks, the theoretical and practical aspects of parallel programming for multi-core architectures, and an introduction to electrical plasma and how it can be used in microelectronics.

Part-time study is in cooperation with the students' employers. Please contact the Programme Director before applying.

Please note: We regularly review and develop our postgraduate programmes. This MSc is also available with the alternative title Electronic Engineering and the Internet of Things MSc (Eng) for entry September 2026, and gives students the option to graduate with either of these two MSc titles.

Who is this course for?

This course is aimed at graduates who already have a good general level of knowledge and understanding in electronics or closely related subjects with advanced knowledge (at level M) and capabilities in the specific areas of microelectronic systems.

What you'll learn

- Develop an understanding of the issues in designing complex digital and analogue systems
- Understanding the capabilities of tools used for the design and simulation of these complex systems
- Build your understanding of signal processing using digital systems.
- Get an awareness of the techniques used for the networking of digital systems
- Knowledge and skills in software engineering, design and management.
- Transferable skills such as analysis, problem-solving, communication and team-working.

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, you will develop your practical programming and coding skills by creating software for engineering applications, and an introduction to the “Internet of Things”.

Modules that will cover semesters one and two will cover digital design techniques, introduce you to materials used in microelectronics, and give you an understanding of designing advanced embedded computer systems – along with a module that will help you to develop the practical skills to develop your final project in semester three.

You’ll be able to develop your specialism through optional modules, where you can learn the fundamentals of image processing, the principles of communications networks, the theoretical and practical aspects of parallel programming for multi-core architectures, and an introduction to electrical plasma and how it can be used in microelectronics.

Students must take 15 optional credits. Modules may be selected from this list subject to the requirement that at least 7.5 credits are completed in Semester 2.

Modules

Compulsory modules	Credits
INTEGRATED CIRCUITS - CONCEPTS AND DESIGN (ELEC472)	15
DIGITAL SYSTEM DESIGN (ELEC473)	15
ADVANCED LOW POWER COMPUTER ARCHITECTURE (ELEC470)	15
RESEARCH SKILLS & PROJECT MANAGEMENT (ELEC483)	15

Compulsory modules	Credits
ENGINEERING PROGRAMMING (ELEC431)	15
THE INTERNET OF THINGS: ARCHITECTURE AND APPLICATIONS (ELEC423)	15

Optional modules	Credits
IMAGE PROCESSING (ELEC319)	7.5
ADVANCED SYSTEMS MODELLING & CONTROL (ELEC476)	15
MULTI-CORE AND MULTI-PROCESSOR PROGRAMMING (COMP528)	15
PLASMA SYSTEM ENGINEERING (ELEC391)	7.5
MOBILE COMMUNICATIONS AND SECURITY (ELEC463)	15

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

Semester two

Your second semester will introduce you to ARM Cortex M Microprocessors. You'll learn about the general functionality, learn to interface a peripheral to the AHB-Lite bus using microprocessors, and use RTX to implement a multi-threaded application.

You will continue to develop your knowledge of materials, and digital design skills while building the knowledge you'll need for your research project – moving into project planning and literature searching.

You'll also have the choice to learn about the principles of communications networks, their components and protocols; develop an in-depth understanding of EMC, the scope of EMC, standards, typical EMC problems and solutions; and get an extensive overview of information theory and coding.

Modules

Compulsory modules	Credits
MICROPROCESSOR SYSTEMS (ELEC422)	15

Optional modules	Credits
COMMUNICATIONS NETWORKS (ELEC461)	15
ELECTROMAGNETIC COMPATIBILITY (ELEC382)	7.5
INFORMATION THEORY AND CODING (ELEC415)	7.5

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

Final project

You will undertake your master's project in Semester 3.

The primary aims of the project are:

- To provide you with the opportunity to gain an in-depth understanding of a subject and to learn research techniques
- To develop your ability to assemble and analyse data, and to apply engineering principles to the solution of practical problem
- To give you the opportunity of applying capacities (knowledge, initiative, enthusiasm, etc.) to plan, carry out and control an open-ended project in a topic of choice
- To gain simulated experience of working as a professional engineer in an industrial or research organisation.

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 by attending lectures, laboratory sessions, tutorials and doing your own research on a specific topic. You are expected to complete all the set coursework and exercises as it is an important part of your learning.

How you're assessed

You will be assessed through various methods including final exams, quizzes, exercises, laboratory reports, presentations, oral examinations and a dissertation.

Liverpool Learning Framework

At Liverpool, we take a distinctive approach to education through the Liverpool Learning Framework. This means teaching that is engaging, inclusive and designed to help you succeed during your studies and beyond.

You'll develop specialist subject knowledge alongside the skills employers value most, including:

- Digital fluency
- Confidence
- Global citizenship

Our curriculum is characterised by the three Liverpool Hallmarks:

- Research-connected teaching - learning informed by the latest ideas and discoveries
- Active learning - taking part, applying knowledge and learning by doing
- Authentic assessment - assessments designed around real-world tasks and challenges

We also embed key priorities across our curriculum, including AI literacy, employability, and sustainability, helping you prepare for the future and make a positive impact in the world.

We're committed to creating a supportive and inclusive learning environment where every student can thrive.

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Careers and employability

This MSc degree programme is the basis for a career in a profession that offers an extremely wide choice of employment opportunities in engineering, research and development, project management, finance and many more.

The graduates of this programme will be qualified across a broad range of subjects related to the electrical engineering and electronic engineering profession. They take up postgraduate training positions in design, development, research, manufacturing and consultancy with leading engineering companies, in order to pursue professional qualifications. Others join smaller engineering companies to pursue professional qualifications while establishing themselves in engineering positions. Some graduates move into non-engineering positions where their analytical, communications and IT skills as well as technical background are much sought-after.

The main career opportunities for graduates from this programme are:

- Companies related to electronics and microelectronics systems
- Companies utilising the latest technology to deal with problems requiring microelectronics solutions at relatively high technical levels
- Companies and government agencies using managing microelectronics systems aspects
- Universities for further education, such as studying for PhD degree

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 - £14,000
Part-time place, per year - £7,000

International fees

Full-time place, per year - £34,000
Part-time place, per year - £17,000

Tuition fees are for the academic year 2026/27.

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 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 £12,858 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. You can find information on the general and subject-specific costs you could expect to incur on our study costs webpage.

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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 Mathematics, Engineering or Physical Sciences.

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

If you took a TOEFL test on or before 20 January 2026, you'll need 88 overall, with minimum scores of listening 17, writing 17, reading 17 and speaking 19. If you took a TOEFL test from 21 January 2026 onwards, when a new scoring system was introduced, you'll need 4.5 overall, with 4 or above in all components. TOEFL Home Edition not accepted.

Duolingo English Test

125 overall, with speaking, reading and writing not less than 105, and listening not below 100. For academic year 2025/26 only, we will also accept the production, literacy, comprehension and conversation score set: 120 overall, with no component below 95.

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 or online
5.5 overall, with no more than one component at 5.0	10 weeks	On campus or online
5.5 overall, with no component below 5.0	12 weeks	Online
5.0 overall, with no component below 5.0	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 at 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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