

Overview

Programme Code	32118-MG
Programme Title	Electrical and Electronic Engineering
Awarding Institution	Liverpool John Moores University
Programme Type	Integrated Masters
Language of Programme	All LJMU programmes are delivered and assessed in English
Programme Leader	Clifford Mayhew
Link Tutor(s)	

Awards

Award Type	Award Description	Award Learning Outcomes
Target Award	Master of Engineering - MG	See Learning Outcomes Below
Recruitable Target	Master of Engineering (SW) - SMG	See Learning Outcomes Below
Alternative Exit	Bachelor of Engineering with Honours - BGH	<p>Demonstrate a detailed knowledge of the core level 6 modules relating to modern engineering techniques and management skills, together with a detailed understanding of their chosen optional modules that is at the forefront of the engineering discipline and informed by research. To demonstrate the ability to use established techniques of analysis and enquiry to solve problems within the field of engineering. Demonstrate the ability to devise and sustain arguments and solve problems using ideas and techniques that are at the forefront of the engineering discipline. Demonstrate an appreciation of the ambiguity, uncertainty and limitations of their knowledge. Demonstrate the ability to plan and organise a technical project whilst considering ethical, regulatory and environmental aspects of electrical engineering design.</p>
Alternative Exit	Diploma of Higher Education - DHE	<p>Undertake advanced mathematical and computational studies of engineering systems and problems. Demonstrate the application of basic principles of Electrical circuits, Electronics, Programming, Measurement and Control and microprocessors from level 4 to the solution of standard engineering problems. Demonstrate the intermediate engineering skills. Demonstrate a clear understanding of the business context of engineering development and activities and to demonstrate a range of business skills. A student who successfully completes a placement year will be eligible for the Sandwich award and will, in addition to the above, be able to demonstrate the professional and personal skills necessary for effective employment within a professional environment.</p>
Alternative Exit	Certificate of Higher Education - CHE	<p>Undertake basic mathematical analysis suitable to enable the study of engineering. Apply the basic principles of Electrical circuits, Electronics, Programming, Measurement and Control, Communications and microprocessors to simplified engineering problems. Design, simulate and construct, and test simple circuits. Demonstrate key skills appropriate to the professional engineer.</p>

Alternative Exit	Bachelor of Engineering Honours (SW) - SBGH	Demonstrate a detailed knowledge of the core level 6 modules relating to modern engineering techniques and management skills, together with a detailed understanding of their chosen optional modules that is at the forefront of the engineering discipline and informed by research. To demonstrate the ability to use established techniques of analysis and enquiry to solve problems within the field of engineering. Demonstrate the ability to devise and sustain arguments and solve problems using ideas and techniques that are at the forefront of the engineering discipline. Demonstrate an appreciation of the ambiguity, uncertainty and limitations of their knowledge. Demonstrate the ability to plan and organise a technical project whilst considering ethical, regulatory and environmental aspects of electrical engineering design. Demonstrate the professional and personal skills necessary for effective employment within a professional environment.
Alternative Exit	Diploma in Higher Education (SW) - SDHE	Undertake advanced mathematical and computational studies of engineering systems and problems. Demonstrate the application of basic principles of Electrical circuits, Electronics, Programming, Measurement and Control and microprocessors from level 4 to the solution of standard engineering problems. Demonstrate the intermediate engineering skills. Demonstrate a clear understanding of the business context of engineering development and activities and to demonstrate a range of business skills. A student who successfully completes a placement year will be eligible for the Sandwich award and will, in addition to the above, be able to demonstrate the professional and personal skills necessary for effective employment within a professional environment.

Alternate Award Names	
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External Benchmarks

Subject Benchmark Statement	UG-Engineering (2019)
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Accreditation

Programme Accredited by

PSRB Name	Type of Accreditation	Valid From Date	Valid To Date	Additional Notes

Institution of Engineering and Technology (IET)	Accredited by the Institution of Engineering and Technology on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as a Chartered Engineer.		
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Programme Offering(s)

Mode of Study, Mode of Delivery	Intake Month	Teaching Institution	Programme Length
Full-Time, Face to Face	September	LJMU Taught	4 Years
Sandwich Year Out, Face to Face	September	LJMU Taught	5 Years

Aims and Outcomes

Educational Aims of the Programme

The M.Eng. programme in Electrical Engineering fulfils all the educational requirements for Chartered Engineer status. It is designed to develop a high level of technical expertise together with the emotional intelligence to be able to practice successfully as a professional engineer in a modern interdisciplinary engineering environment. New graduate engineers are increasingly expected to take on important technical leadership and management responsibilities early in their careers and the knowledge and skills gained from this programme are designed to produce graduates who are able to make an immediate contribution to their employers organisations. The programme aims to: Provide a programme of study, which develops core knowledge, and understanding of engineering principles, mathematics, and computation, appropriate to the field of Electrical and Electronic engineering. Enable students to develop specialist knowledge, intellectual and practical skills that will enable them to analyse, investigate and develop robust solutions to Electrical and Electronic engineering problems. Develop relevant study and personal skills so that students progressively take responsibility for their learning, becoming, independent learners, while receiving appropriate tutoring and support. Equip students with a range of transferable skills and attributes in the use of computers, software packages, team working, communication, time management and problem solving methodology which will enable them to undertake responsible roles in industry and commerce. Provide a degree programme which meets the accreditation requirements of AHEP-4 UK Spec and the needs of industry. Develop Students to work in and manage teams and also work independently at managerial level utilising project management and technical skills. To encourage students to engage with the development of employability skills by completing a self-awareness statement. For students undertaking a placement year the aim is to provide students with an extended period of work experience at an approved partner that will complement their programme of study at LJMU. This will give the students the opportunity to develop professional skills relevant to their programme of study, as well as attitude and behaviours necessary for employment in a diverse and changing environment.

Learning Outcomes

Code	Description
PLO1	Maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing technology.
PLO2	Communicate in English with others at all Levels
PLO3	Present and discuss proposals.
PLO4	Demonstrate personal and social skills.
PLO5	Comply with relevant codes of conduct.
PLO6	Manage and apply safe systems of work.
PLO7	Undertake engineering activities in a way that contributes to sustainable development.
PLO8	Carry out and record CPD necessary to maintain and enhance competence in own area of practice
PLO9	Exercise responsibilities in an ethical manner, considering diversity and security of data.
PLO10	Engage in the creative and innovative development of engineering technology and continuous improvement systems.
PLO11	Identify potential projects and opportunities.
PLO12	Conduct appropriate research, and undertake design and development of engineering solutions.
PLO13	Manage implementation of design solutions, and evaluate their effectiveness.
PLO14	Plan for effective project implementation.
PLO15	Plan, budget, organise, direct and control tasks, people and resources.
PLO16	Lead teams and develop staff to meet changing technical and managerial needs.
PLO17	Bring about continuous improvement through quality management.

Programme Structure

Programme Structure Description

Students have the option to undertake a placement year. The placement year, module 5330ELE, will follow Level 5 and students will be enrolled on a 600 credit honours sandwich programme. The Level 5 mean for the final award mark will be calculated based upon the 240 credits at Level 5. Students successfully completing the assessment of the placement year are eligible for a Sandwich award. Students not undertaking a placement year are registered on the non-sandwich version of the programme and will have the opportunity of an additional study year abroad following Level 5. Students will be enrolled on a 600 credit honours with study abroad programme. Of those 600 credits, 120 will be taken via a Level 5 study abroad module 5331ELE. The modules to be studied in the host institution must be agreed in advance. The Level 5 mean for the final award mark will be calculated based upon the 240 credits at Level 5.

Programme Structure - 480 credit points	
Level 4 - 120 credit points	
Level 4 Core - 120 credit points	CORE
[MODULE] 4301MECH Engineering Mathematics 1a Approved 2022.03 - 10 credit points	
[MODULE] 4302MECH Engineering Mathematics 1b Approved 2022.02 - 10 credit points	
[MODULE] 4401ELE Digital Electronics Approved 2022.02 - 20 credit points	
[MODULE] 4402ELE Software Development for Embedded Systems Approved 2022.01 - 20 credit points	
[MODULE] 4403ELE Engineering Circuit Analysis Approved 2022.02 - 20 credit points	
[MODULE] 4404ELE Analogue Electronics Approved 2022.02 - 20 credit points	
[MODULE] 4405ELE Professional Practice and the Environment Approved 2022.02 - 20 credit points	
Level 5 - 120 credit points	
Level 5 Core - 120 credit points	CORE
[MODULE] 5401ELE Embedded Systems Programming and Applications in the Environment Approved 2022.01 - 20 credit points	
[MODULE] 5402ELE Electric machines, power systems and clean energy Approved 2022.02 - 20 credit points	
[MODULE] 5404ELE Linear Electronics Design and the Environment Approved 2022.02 - 10 credit points	
[MODULE] 5405ELE Instrumentation and Control Engineering Approved 2022.01 - 20 credit points	
[MODULE] 5406ELE Professional Practice Integrative Project Approved 2022.02 - 20 credit points	
[MODULE] 5412ELE Local Communications Systems and Applications Approved 2022.02 - 20 credit points	
[MODULE] 5421ELE Advanced Mathematics Approved 2022.01 - 10 credit points	
Optional placement - 120 credit points	OPTIONAL
Placement Year - 120 credit points	OPTIONAL
[MODULE] 5330ELE Sandwich Year - Electrical and Electronic Engineering Approved 2022.01 - 120 credit points	
OR Study Abroad - 120 credit points	OPTIONAL
[MODULE] 5331ELE Study Year Abroad - Electrical and Electronic Engineering Approved 2022.01 - 120 credit points	
Level 6 - 120 credit points	
Level 6 Core - 80 credit points	CORE

[MODULE] 6401ELE Signals and Systems with Real World Applications Approved 2022.03 - 10 credit points	
[MODULE] 6405ELE Power Electronics and Energy Efficient Drives Approved 2022.02 - 20 credit points	
[MODULE] 6455ELE Engineering Project Approved 2022.02 - 40 credit points	
[MODULE] 6465ELE Engineering Management Approved 2022.01 - 10 credit points	
Level 6 Optional - 40 credit points	OPTIONAL
[MODULE] 6400ELE Automation and IoT Approved 2022.03 - 20 credit points	
[MODULE] 6406ELE Further Electronic Design Approved 2022.02 - 20 credit points	
[MODULE] 6412ELE Process Control and Applications Approved 2022.02 - 20 credit points	
Level 7 - 120 credit points	
Level 7 Core - 80 credit points	CORE
[MODULE] 7401ELE Professional Practice Approved 2022.01 - 20 credit points	
[MODULE] 7402ELE Control Engineering Approved 2022.01 - 20 credit points	
[MODULE] 7406ELE Renewable Electric Power Systems Approved 2022.01 - 10 credit points	
[MODULE] 7416ELE Group Design Project Approved 2022.01 - 30 credit points	
Level 7 Optional - 40 credit points	OPTIONAL
[MODULE] 7400ELE Modelling and Control of Electric Machines and Drives Approved 2022.02 - 20 credit points	
[MODULE] 7404ELE Digital IC Design Approved 2022.02 - 20 credit points	
[MODULE] 7405ELE Nano Devices, Fabrication and Testing Approved 2022.01 - 20 credit points	

Module specifications may be accessed at <https://proformas.ljmu.ac.uk/Default.aspx>

Approved variance from Academic Framework Regulations

Variance

A level average of at least 50% is required for students to transfer from Bachelor's Degree with Honours to Integrated Master's. The following criteria will apply for students at Level 5, Level 6 and Level 7: Where a module comprises two or more assessment elements (e.g. examination and coursework), successful completion of the module should require a mark of greater than 10% less than the module pass mark in each element, as well as the overall module mark being above the normal pass mark (normally 40% or 50%). This requirement only applies to assessment elements that contribute more than 30% towards the final module mark. Variance approved on January 21st 2022.

Teaching, Learning and Assessment

Acquisition of underpinning knowledge is achieved mainly through lectures and directed student-centred learning. Student-centred learning is used where appropriate resource material is available. The economic, Social and Environmental context of engineering operations is delivered by means of lectures and case studies. The use of appropriate case study material is an essential part of teaching in this area. Testing of the knowledge base is through a combination of unseen written examinations, and coursework assignment submissions. Engineering Analysis is developed through lectures, case-studies and coursework assignments. Fundamental principles are delivered predominantly by lectures and laboratory classes. More advanced techniques are delivered by project work and coursework supported by lectures. Engineering Analysis and problem solving skills are assessed through a combination of unseen written examinations, assessed coursework and laboratory work, and project work Design is taught by coursework, individual and group project work supported by an appropriate lecture programme. Design skills are assessed by coursework, individual and group written design project reports, and student presentations. Engineering Practice permeates almost every activity within the programme content and assessment. Assessment of Engineering Practice is varied throughout the programme but is mostly coursework based.

Opportunities for work related learning

Students are encouraged to undertake a year long industrial placement between Level 5 and 6. There is a further opportunity to undertake summer placements between academic years to gain valuable industrial experience. This work experience will help develop understanding of the world of work environment suitable for the programme and increase a student's professional practical skills.

Entry Requirements

Type	Description
UCAS points	128
T levels	T Level requirements: 128 UCAS tariff points from relevant subjects. Please contact the Faculty for further information.
OCR Cambridge Technical	<p>Technical Certificate: Acceptable only when combined with other qualifications</p> <p>Technical Diploma: Acceptable only when combined with other qualifications</p> <p>Technical Extended Diploma: Acceptable on its own and combined with other qualifications</p> <p>Technical Foundation Diploma: Acceptable only when combined with other qualifications</p> <p>Technical Introductory Diploma: Acceptable only when combined with other qualifications</p> <p>Technical Subsidiary Diploma: Acceptable only when combined with other qualifications</p>

Reduced offer scheme	As part of LJMU's commitment to widening access we offer eligible students entry to their chosen course at a reduced threshold between 8 and 16 UCAS points. This applies if you are a student who has experience of living in local authority care or if you have participated in one of LJMU's sustained outreach programmes such as a summer university. Please contact course enquiries for further details.
Alternative qualifications considered	Please contact the University if you have any questions regarding the relevance of your qualifications
IELTS	6.0 (minimum of 5.5 in each component) or equivalent English language proficiency test .
A levels	<p>Minimum number of A Levels required: 2</p> <p>Subject specific requirements: 80 UCAS points at A Level from Maths and one of the following: Physics, Chemistry, Computing, Further Maths, Electronics or Engineering.</p> <p>Is general studies acceptable? Yes</p> <p>Average A Level offer: ABB</p> <p>Are AS level awards acceptable? Acceptable only when combined with other qualifications</p> <p>Maximum AS Level points accepted: 20</p>
Interview required	No interview required (UCAS application form only)
Irish awards	<p>Irish Leaving Certificate: Acceptable on its own and combined with other qualifications</p> <p>Grades / subjects required: 128 UCAS points from a minimum of 5 subjects including appropriate Maths and Physics</p>

GCSEs and equivalents	<p>Prior to starting the programme applicants must have obtained Grade C or Grade 4 or above in English Language and Mathematics GCSE or an approved alternative qualification below:</p> <p>Key Skills Level 2 in English/Maths</p> <p>NVQ Level 2 Functional skills in Maths and English Writing and or Reading</p> <p>Skills for Life Level 2 in Numeracy/English</p> <p>Higher Diploma in Maths/English</p> <p>Functional Skills Level 2 in Maths/English</p> <p>Northern Ireland Essential Skills Level 2 in Communication or Application of Number</p> <p>Wales Essential Skills Level 2 in Communication or Application of Number</p>
Access awards	<p>Access to Higher Education Diploma acceptability: Not acceptable</p> <p>Further information: Access to HE Diploma would be acceptable for entry to the BEng route. Students who perform well on during year one and two of the BEng would have the option to transfer to MEng</p>
International Baccalaureate	<p>International Baccalaureate: Acceptable on its own and combined with other qualifications</p> <p>Additional information: 128 UCAS tariff points including a minimum score of 6 in HL Mathematics and 6 in HL Physics.</p>
BTECs	<p>National Certificate (RQF): Acceptable only when combined with other qualifications</p> <p>National Extended Certificate: Acceptable only when combined with other qualifications</p> <p>National Diploma (RQF): Acceptable only when combined with other qualifications</p> <p>National Diploma subjects / grades required: To the value of 128 UCAS points when combined with other qualifications. Must be in an Engineering discipline. A Distinction grade in the Further Mathematics unit is required.</p> <p>National Extended Diploma (RQF): Acceptable only when combined with other qualifications</p> <p>National Extended Diploma subjects / grades required: DDM if studied on its own or To the total of 128 UCAS points when combined with other qualifications. Engineering discipline required with a Distinction grade in Further Mathematics unit.</p>
Welsh awards	<p>Welsh Baccalaureate: Acceptable only when combined with other qualifications</p>

Extra Entry Requirements

Is a DBS check required?

No