Programme Specification Document

Approved, 2022.02

Overview

Programme Code	35946
Programme Title	Electrical and Electronic Engineering
Awarding Institution	Liverpool John Moores University
Programme Type	Apprenticeship
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	Bachelor of Engineering with Honours - BGH	See Learning Outcomes Below
Alternative Exit	Certificate of Higher Education - CHE	Undertake basic mathematical analysis suitable to enable the study of engineering. 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. 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. Design, simulate and construct, and test simple circuits. Demonstrate key skills appropriate to the professional engineer. Demonstrate key skills appropriate to the professional engineer.
Alternative Exit	Diploma of Higher Education - DHE	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.

Alternate Award Names	

External Benchmarks

Subject Benchmark Statement	UG-Engineering (2019)

Apprenticeship Standard

Apprenticeship Standard	End Point Assessment	Proposed Off the Job Training delivery
Embedded electronic systems design and development engineer (degree) - ST0151	Non-Integrated	

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 (IET) on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as an Incorporated Engineer and partially meeting the academic requirement for registration as a Chartered Engineer.		

Programme Offering(s)

Mode of Study, Mode of Delivery	Intake Month	Teaching Institution	Programme Length
Full-Time, Face to Face	September	LJMU Taught	6 Years

Aims and Outcomes

Educational Aims of the Programme

This programme is for degree apprentice students only. The Part Time B.Eng. programme in Electrical Engineering partially fulfils 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.

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

Part Time Students will study the programme over a 6 year period. The programme is designed as follows: Year 1 - 4301MECH; 4302MECH; 4401ELE; 4404ELE Year 2 - 4402ELE; 4403ELE; 4405ELE Year 3 - 5404ELE; 5405ELE; 5406ELE; 5421ELE Year 4 - 5401ELE; 5402ELE; 5412ELE Year 5 - 6401ELE; 6405ELE; 6465ELE Year 6 - 6455ELE; Option 1; Option 2

Apprentices all need to complete mandatory training in Safeguarding, British Values and Prevent before they can undertake the End Point Assessment. Generic, mandatory online training programmes will offered to apprentices and this may be supplemented by additional training that is specific to the programme.

Programme Structure - 360 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	
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	

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

Approved variance from Academic Framework Regulations

Variance

The following criteria will apply for students at Level 5, Level 6: 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

Some of the modules are delivered through your professional practice at work. You will need to undertake projects and record work activity in order to complete these modules.

Entry Requirements

Type	Description
Other international requirements	Other Applicants offering other awards (e.g. Welsh Baccalaureate, European Baccalaureate, pre-2002 BTEC National Certificate/Diploma, Advanced Extension Awards, pre-curriculum 2000 A-levels etc.) or combinations of unit awards may also be accepted.

Alternative qualifications considered	Applicants should have five GCSE (or equivalent) passes of at least grade C, or grade 4, including Mathematics and English (or IELTS 6.0). We welcome applications from highly motivated mature students with relevant experience but without the necessary formal qualifications. All applications will be considered on an individual basis.
A levels	Applicants should have or expect to obtain a total of 112 UCAS points. At A2-level, applicants should expect to obtain at least two awards and gain at least 64 points from A Level Mathematics and one of the following (Physics, Chemistry, Computing, Further Maths, Electronics or Engineering)
BTECs	BTEC National Award Applicants should have or expect to obtain a grade M in a BTEC National Award in a subject relevant to the intended degree, such as Engineering, ICT Systems Support or Applied Physics, including a Merit in a mathematics unit or relevant Free-Standing Mathematics Qualifications, together with other relevant qualifications to obtain a total of 112 UCAS points BTEC National Certificate Applicants should have or expect to obtain a BTEC National Certificate with an overall grade of DD in a subject (including optional units relevant to the intended degree) such as Engineering, ICT Systems Support or Laboratory and Industrial Science. Alternatively, applicants may achieve an overall grade of MM supplemented with relevant qualifications to achieve a total of 112 UCAS points. The BTEC National Certificate should include a merit in a further mathematics unit or be supplemented with appropriate Free-Standing Mathematics Qualifications. BTEC National Diploma Applicants should have or expect to obtain a BTEC National Diploma with an overall grade of MMM in a subject (including optional units relevant to the intended degree) such as Engineering, ICT Systems Support or Laboratory and Industrial Science. Alternatively, applicants may achieve an overall grade of MMP supplemented with relevant qualifications to achieve a total of 112 UCAS points. The BTEC National Diploma should include a merit in the further mathematics unit or be supplemented with appropriate Free-Standing Mathematics Qualifications.

Extra Entry Requirements