Programme Specification Document

Approved, 2022.02

Overview

Programme Code	35960
Programme Title	Control and Automation 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. To apply the basic principles of Electrical circuits, Electronics, Programming, Measurement and Control, Communications and microprocessors to simplified engineering problems relevant to Control and Automation Engineering. To design, simulate and construct, and test simple circuits and systems. To demonstrate key skills appropriate to the professional engineer.
Alternative Exit	Diploma of Higher Education - DHE	To undertake advanced mathematical and computational studies of automated and controlled engineering systems and problems. To 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 relevant to the Control and Automation industry. To demonstrate the intermediate engineering skills. To 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	

External Benchmarks

Subject Benchmark Statement	UG-Engineering (2019)

Apprenticeship Standard

Apprenticeship Standard	End Point Assessment	Proposed Off the Job Training delivery
Process automation engineer (degree) - ST0407	Non-Integrated	

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 Control and Automation Engineering partially 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 Control and Automation Engineering. Enable students to develop specialist knowledge, intellectual and practical skills that will enable them to analyse, investigate and develop robust solutions to Control and Automation 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-3 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
PLO10	Engage in the creative and innovative development of engineering technology and continuous improvement systems.
PLO11	Identify potential projects and opportunities.

Code	Description
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

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.

Part Time Students will study the programme over a 6 year period. The programme is designed as follows: Year 1 - 4315ELE; 4316ELE; 4301ELE; 4304ELE Year 2 - 4302ELE; 4303ELE; 4305ELE Year 3 - 5304ELE; 5305ELE; 5306ELE; 5321ELE Year 4 - 5301ELE; 5302ELE; 5312ELE Year 5 - 6300ELE; 6302ELE; 6365ELE Year 6 - 6355ELE; 6305ELE; 6312ELE

Programme Structure - 360 credit points	
Level 4 - 120 credit points	
Level 4 Core - 120 credit points	CORE
[MODULE] 4301ELE Engineering Principles Approved 2022.01 - 20 credit points	
[MODULE] 4302ELE Microprocessors and Software Approved 2022.01 - 20 credit points	
[MODULE] 4303ELE Electrical Circuit Principles Approved 2022.01 - 20 credit points	
[MODULE] 4304ELE Digital and Analogue Electronics Approved 2022.01 - 20 credit points	
[MODULE] 4305ELE Electrical Engineering Practice 1 Approved 2022.01 - 20 credit points	
[MODULE] 4315ELE Engineering Mathematics 1a Approved 2022.01 - 10 credit points	
[MODULE] 4316ELE Engineering Mathematics 1b Approved 2022.01 - 10 credit points	
Level 5 - 120 credit points	
Level 5 Core - 120 credit points	CORE
[MODULE] 5301ELE Digital and Embedded Systems Approved 2022.01 - 20 credit points	
[MODULE] 5302ELE Electric Machines Approved 2022.01 - 20 credit points	
[MODULE] 5304ELE Linear Electronics Approved 2022.02 - 10 credit points	
[MODULE] 5305ELE Control System Design and Analysis Approved 2022.02 - 20 credit points	
[MODULE] 5306ELE Electrical Engineering Practice 2 Approved 2022.01 - 20 credit points	
[MODULE] 5312ELE Applied Instrumentation Approved 2022.01 - 20 credit points	
[MODULE] 5321ELE Engineering Mathematics 2 Approved 2022.01 - 10 credit points	
Level 6 - 120 credit points	
Level 6 Core - No credit points	CORE
[MODULE] 6300ELE Automation Approved 2022.01 - 10 credit points	
[MODULE] 6302ELE Embedded Systems Approved 2022.01 - 20 credit points	
[MODULE] 6305ELE Power Electronics, Drives and Systems Approved 2022.01 - 20 credit points	
[MODULE] 6312ELE Process Control Approved 2022.02 - 20 credit points	
[MODULE] 6355ELE Engineering Project Approved 2022.01 - 30 credit points	
[MODULE] 6365ELE Industrial Management Approved 2022.01 - 20 credit points	

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

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 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.
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.

Alternative qualifications considered	Applicants should have five GCSE (or equivalent) passes of at least grade C 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.

Extra Entry Requirements