PROGRAMME SPECIFICATION

Bachelor of Engineering with Honours in Control and Automation Engineering

Awarding institution	Liverpool John Moores University
Teaching institution	LJMU
JACS Code	H650
Programme Duration	Part-Time: 6 Years
Language of Programme	All LJMU programmes are delivered and assessed in English
Subject benchmark statement	Engineering Council UK Spec and AHEP 3rd Edition Engineering Subject Benchmark Statement (2015)
Programme accredited by	Institution of Engineering and Technology (IET)
Description of accreditation	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.
Validated target and alternative exit awards	Bachelor of Engineering with Honours in Control and Automation Engineering Diploma of Higher Education in Control and Automation Engineering Certificate of Higher Education in Control and Automation Engineering
Programme Leader	Clifford Mayhew

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.

Alternative Exit/ Interim Award Learning Outcomes - Certificate of Higher Education

A student who is eligible for this award will be able to:

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/ Interim Award Learning Outcomes - Diploma of Higher Education

A student who is eligible for this award will be able to:

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.

Target award Learning Outcomes - Bachelor of Engineering with Honours

A student successfully completing the programme of study will have acquired the following subject knowledge and understanding as well as skills and other attributes.

A student who is eligible for this award will be able to:

1. Maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing technology.

2. Engage in the creative and innovative development of engineering technology and continuous improvement systems.

3. Identify potential projects and opportunities.

4. Conduct appropriate research, and undertake design and development of engineering solutions.

5. Manage implementation of design solutions, and evaluate their effectiveness.

6. Plan for effective project implementation.

7. Plan, budget, organise, direct and control tasks, people and resources.

8. Lead teams and develop staff to meet changing technical and managerial needs.

9. Bring about continuous improvement through quality management.

10. Communicate in English with others at all Levels

11. Present and discuss proposals.

12. Demonstrate personal and social skills.

13. Comply with relevant codes of conduct.

14. Manage and apply safe systems of work.

15. Undertake engineering activities in a way that contributes to sustainable development.

16. Carry out and record CPD necessary to maintain and enhance competence in own area of practice

17. Exercise responsibilities in an ethical manner

Teaching, Learning and Assessment

The methods used to enable outcomes to be achieved and demonstrated are as follows:

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.

Programme structure - programme rules and modules

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; 6301ELE; 6365ELE

Year 6 - 6355ELE; 6305ELE; 6312ELE

Level 6	Potential Awards on completion	Bachelor of Engineering with Honours
Core	Option	Award Requirements
6300ELE Automation (10 credits) 6302ELE Embedded Systems (20 credits) 6305ELE Power Electronics, Drives and Systems (20 credits) 6312ELE Process Control (20 credits) 6355ELE Engineering Project (30 credits) 6365ELE Industrial Management (20 credits)		120 core credits at level 6 0 option credits at level 6

Level 5	Potential Awards on completion	
Core	Option	Award Requirements
5301ELE Digital and Embedded Systems (20 credits)		120 core credits at level 5 0 option credits at level 5

5302ELE Electric Machines (20 credits) 5304ELE Linear Electronics (10 credits) 5305ELE Control System Design and Analysis (20 credits) 5306ELE Electrical Engineering Practice 2 (20 credits) 5312ELE Applied Instrumentation (20 credits) 5321ELE Engineering Mathematics 2 (10 credits)		

Level 4	Potential Awards on completion	
Core	Option	Award Requirements
4301ELE Engineering Principles (20 credits) 4302ELE Microprocessors and Software (20 credits) 4303ELE Electrical Circuit Principles (20 credits) 4304ELE Digital and Analogue Electronics (20 credits) 4305ELE Electrical Engineering Practice 1 (20 credits) 4315ELE Engineering Mathematics 1a (10 credits) 4316ELE Engineering Mathematics 1b (10 credits)		120 core credits at level 4 0 option credits at level 4

Information about assessment regulations

All programmes leading to LJMU awards operate within the University's Academic Framework.
https://www.ljmu.ac.uk/about-us/public-information/academic-quality-and-regulations/academic-framework

Opportunities for work-related learning (location and nature of activities)

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.

Criteria for admission

A/AS Level
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)

BTEC National Diploma
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.

Other
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.

Mature entry
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.

Overseas qualifications
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.

External Quality Benchmarks

All programmes leading to LJMU awards have been designed and approved in accordance with the UK Quality Code for Higher Education, including the Framework for Higher Education Qualifications in the UK (FHEQ) and subject benchmark statements where applicable.

The University is subject to periodic review of its quality and standards by the Quality Assurance Agency (QAA) Published review reports are available on the QAA website at www.qaa.ac.uk

Programmes which are professionally accredited are reviewed by professional, statutory and regulatory bodies (PSRBs) and such programmes must meet the competencies/standards of those PSRBs.

Support for students and their learning

The University aims to provide students with access to appropriate and timely information, support and guidance to ensure that they are able to benefit fully from their time at LJMU. All students are assigned a Personal Tutor to provide academic support and when necessary signpost students to the appropriate University support services.

Students are able to access a range of professional services including:

- Advice on practical aspects of study and how to use these opportunities to support and enhance their personal and academic development. This includes support for placements and careers guidance.
- Student Advice and Wellbeing Services provide students with advice, support and information, particularly in the areas of: student funding and financial matters, disability, advice and support to international students, study support, accommodation, health, wellbeing and counselling.
- Students studying for an LJMU award at a partner organisation will have access to local support services

Methods for evaluating and improving the quality and standards of teaching and learning

Student Feedback and Evaluation

The University uses the results of student feedback from internal and external student surveys (such as module evaluations, the NSS and PTES), module evaluation questionnaires and meetings with student representatives to improve the quality of programmes.

Staff development

The quality of teaching is assured through staff review and staff development in learning, teaching and assessment.

Internal Review

All programmes are reviewed annually and periodically, informed by a range of data and feedback, to ensure quality and standards of programmes and to make improvements to programmes.

External Examining

External examiners are appointed to programmes to assess whether:

- the University is maintaining the threshold academic standards set for awards in accordance with the FHEQ and applicable subject benchmark statements
- the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with University policies and regulations
- the academic standards are comparable with those in other UK higher education institutions of which external examiners have experience
- the achievement of students are comparable with those in other UK higher education institutions of which the external examiners have experience

and to provide informative comment and recommendations on:

- good practice and innovation relating to learning, teaching and assessment observed by external examiners
- opportunities to enhance the quality of the learning opportunities provided to students

Please note:

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content, teaching, learning and assessment methods of each module can be found in module and programme guides.