Programme Specification Document

Approved, 2022.03

Overview

Programme Code	36183-MG
Programme Title	Mechatronics and Autonomous Systems
Awarding Institution	Liverpool John Moores University
Programme Type	Integrated Masters
Language of Programme	All LJMU programmes are delivered and assessed in English
Programme Leader	

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	See 36183-BGH for learning outcomes
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. 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.
Alternative Exit	Bachelor of Engineering Honours (SW) - SBGH	See 36183-BGH for learning outcomes

Alternate Award Names	

External Benchmarks

Subject Benchmark Statement	UG-Engineering (2019)

Programme Offering(s)

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

Aims and Outcomes

Educational Aims of the Programme

The MEng programme in Mechatronics and Autonomous Systems is one our integrated masters degree programmes which extends the technical content beyond the scope of the normal first degree programme and prepares graduates for managerial and project management roles by the increased use of group based activities. 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 MEng programme fulfils all the educational requirements for registration as a Chartered Engineer. The MEng programme 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. This programme will develop student's research and technical communication skills and awareness of the legal and ethical framework surrounding the activities of a professional engineer. This will include personnel, health, safety, and risk (including environmental risk) issues. 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	Use a sound theoretical approach and advanced technical knowledge to enable the introduction and exploitation of new and advancing technology.
PLO2	Communicate in English about advanced engineering topics.
PLO3	Present and discuss proposals.
PLO4	Demonstrate personal and social skills.
PLO5	Understand and apply relevant codes of conduct.
PLO6	Undertake risk assessment activities and 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 of teams.
PLO9	Demonstrate understanding of the professional, ethical and moral responsibilities of a professional engineer, including: diversity and security of data.

Code	Description
PLO10	Use research and communication skills to engage others in the creative and innovative development of engineering technology and continuous improvement systems.
PLO11	Identify potential projects and opportunities.
PLO12	Analyse problems and conduct appropriate research as a basis for undertaking design and development of engineering solutions.
PLO13	Manage groups in the 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] 4303MECH Applied Mechanics 1 Approved 2022.01 - 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] 5304MECH Applied Mechanics 2 Approved 2022.01 - 20 credit points	
[MODULE] 5308MECH Mechatronics 2 Approved 2022.01 - 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 - 120 credit points	CORE
[MODULE] 6313MECH Dynamics and Control Approved 2022.01 - 10 credit points	
[MODULE] 6400ELE Automation and IoT Approved 2022.03 - 20 credit points	

[MODULE] 6412ELE Process Control and Applications Approved 2022.02 - 20 credit points		
[MODULE] 6413ELE Autonomous Systems and Machine Learning Approved 2022.01 - 20 credit points		
[MODULE] 6456ELE Mechatronics Engineering Project Approved 2022.02 - 40 credit points		
[MODULE] 6465ELE Engineering Management Approved 2022.01 - 10 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] 7407ELE Digital Control 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] 7408ELE Artificial Intelligence Approved 2022.01 - 20 credit points		
[MODULE] 7409ELE Embedded Systems 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

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

Teaching and learning: Lectures Tutorials Laboratory work Group projects Individual projects Individual and group presentations Poster presentation Design, build and test exercises Computer programming exercises On line formative quizzes Assessment: Written examinations On line summative quizzes Group design projects and reports Individual projects and reports Poster display Laboratory logbook

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

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 of up to 16/8 UCAS points. This applies if you are a student who has been in local authority care or if you have participated in one of LJMU's sustained outreach initiatives, e.g. Summer University. Please contact the admission office for further details.
Interview required	**Will I be interviewed?** No interview required (UCAS application form only)
IELTS	6.0 (minimum of 5.5 in each component) or [equivalent English language proficiency test]().
Irish awards	**Irish Leaving Certificate:** Acceptable on its own and combined with other qualifications **Grades / subjects required:** 128 UCAS points from a minimum of 5 subjects including appropriate Maths and Physics
Welsh awards	**Welsh Baccalaureate:** Acceptable only when combined with other qualifications
BTECs	**National Certificate (RQF):** Acceptable only when combined with other qualifications **National Extended Certificate:** Acceptable only when combined with other qualifications **National Diploma (RQF):** Acceptable only when combined with other qualifications **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. **National Extended Diploma (RQF):** Acceptable on its own and combined with other qualifications **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.

OCR Cambridge Technical	**Technical Certificate:** Acceptable on its own and combined with other qualifications
	Technical Diploma: Acceptable on its own and combined with other qualifications
	Technical Extended Diploma: Acceptable on its own in a relevant subject area
	Technical Foundation Diploma: Acceptable only when combined with other qualifications
	Technical Introductory Diploma: Acceptable only when combined with other qualifications
	Technical Subsidiary Diploma: Acceptable only when combined with other qualifications
Alternative qualifications considered	Please contact the University if you have any questions regarding the relevance of your qualifications
GCSEs and equivalents	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: Key Skills Level 2 in English/Maths NVQ Level 2 Functional skills in Maths and English Writing and or Reading Skills for Life Level 2 in Numeracy/English Higher Diploma in Maths/English Functional Skills Level 2 in Maths/English Northern Ireland Essential Skills Level 2 in Communication or Application of Number Wales Essential Skills Level 2 in Communication or Application of Number
T levels	**T Level requirements:** 128 UCAS tariff points from relevant subjects. Please contact the Faculty for further information.
International Baccalaureate	**International Baccalaureate:** Acceptable on its own and combined with other qualifications **Additional information:** 128 UCAS tariff points including a minimum score of 6 in HL Mathematics and 6 in HL Physics.

A levels	**Minimum number of A Levels required:** 2
	Subject specific requirements: 80 UCAS points at A Level from Maths and one of the following: Physics, Chemistry, Computing, Further Maths, Electronics or Engineering.
	Is general studies acceptable? Yes
	Average A Level offer: ABB
	Are AS level awards acceptable? Acceptable only when combined with other qualifications
	Maximum AS Level points accepted: 20
UCAS points	128
Access awards	**Access to Higher Education Diploma acceptability:** Not acceptable
	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

Extra Entry Requirements

Is a DBS check required?
No
Can this course be deferred?
Yes