Computing and Smart Devices

Programme Information

2022.01, Approved

Overview

Programme Code	35922
Programme Title	Computing and Smart Devices
Awarding Institution	Liverpool John Moores University
Programme Type	Degree

Awards

Award Type	Award Description	Award Learning Outcomes
Alternative Exit	Bachelor of Science (SW) - SBS	Students who obtain this award will have achieved most but not all of the programme learning outcomes of the equivalent Batchelors award with honours.
Recruitable Target	Bachelor of Science with Honours (SW) - SBSH	Provide evidence of their enhanced knowledge, experience and capabilities acquired through an approved industrial placement opportunity in a UK, European or international organisation involved in a relevant computing and/or smart devices arena. Furthermore, they will be able to demonstrate the professional and personal skills necessary for effective employment within a professional environment.
Target Award	Bachelor of Science with Honours - BSH	N/A

Alternative Exit	Certificate of Higher Education - CHE	Apply fundamental knowledge and acquire the key skills required for the Certificate of Higher Education. Apply fundamental knowledge and acquire the key skills required for the Certificate of Higher Education. Acquire and apply the fundamental mathematical knowledge sufficient to underpin the study of the technical modules within the programme. Acquire and apply the fundamental mathematical knowledge sufficient to underpin the study of the technical modules within the programme. Apply the fundamental principles of electrical and electronic circuits, computer technology and programming to simplified engineering problems. Apply the fundamental principles of electrical and electronic circuits, computer technology and programming to simplified engineering problems. Simulate, construct and test simple circuits and systems incorporating computer technology and embedded systems. Simulate, construct and test simple circuits and systems incorporating computer technology and embedded systems. Write and test simple programmes to drive computerised systems. Write and test simple programmes to drive computerised systems. Demonstrate key skills appropriate to the professional technologist. Demonstrate key skills appropriate to the professional technologist.
Alternative Exit	Diploma of Higher Education - DHE	Demonstrate greater subject knowledge and a deeper understanding of the core principles expected from a professional technologist working in the computing and smart devices arena. Undertake further programming and electronics study associated with engineering and computerised systems and their associated problems. Demonstrate the application and understanding of more complex design of electronics, programming, networking and integrated systems to the solution of engineering problems. Demonstrate the intermediate technologist skills that will be required for effective further study. Demonstrate a clear understanding of the economic, legal, social, ethical and environmental contexts of engineering development and activity.

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 Programme Length Unit
Full-Time, Face to Face	September	LJMU Taught	3 Years
Sandwich Year Out, Face to Face	September	LJMU Taught	4 Years

Aims and Outcomes

Educational Aims of the Programme	The BSc programme in Computing & Smart Devices has been designed to fulfil the educational, knowledge and understanding requirements for IEng registration of the Engineering Council Register. 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. 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 is designed to produce graduates who are able to make an immediate impact to their employers' organisations. Graduates of this programme should be able to: Use a combination of general and specialist knowledge and understanding in the context of existing and emerging technology. Apply appropriate practical methods to design, develop, manufacture and integrate electronic, embedded communication and computerised systems into a seamlessly operating environment applicable to modern day devices and industrial applications. Demonstrate knowledge and understanding of technical and commercial management. Demonstrate effective communication and interpersonal skills. Demonstrate an understanding of professional and ethical standards and recognise obligations to society, the profession and the environment. Additionally for sandwich students, the programme will provide first hand knowledge and experience of the practice and application of Computing & Smart Devices in UK and European industry.

Learning Outcomes

Code	Number	Description
PLO1	1	Apply knowledge and understanding of the scientific principles underpinning relevant current technologies and their evolution.
PLO2	2	Apply problem-solving skills, technical knowledge and understanding to create or adapt design solutions that are fit for purpose including operation, maintenance, reliability etc.
PLO3	3	Manage the design process, including cost drivers and evaluate outcomes.
PLO4	4	Communicate their work to technical and non-technical audiences.
PLO5	5	Understand the need for a high level of professional and ethical conduct in engineering and a knowledge of professional codes of conduct.
PLO6	6	Apply knowledge and understanding of the commercial, economic and social context of engineering processes.
PLO7	7	Apply knowledge of management techniques that may be used to achieve engineering objectives.
PLO8	8	Understand the requirement for engineering activities to promote sustainable development.
PLO9	9	Demonstrate an awareness of relevant legal requirements governing engineering activities, including personnel, health & safety, contracts, intellectual property rights, product safety and liability issues.

PLO10	10	Demonstrate an awareness of risk issues, including health & safety, environmental and commercial risk.
PLO11	11	Understand contexts in which engineering knowledge can be applied e.g. operations and management, application and development of technology, etc.
PLO12	12	Apply knowledge and understanding of mathematics and an awareness of statistical methods necessary to support application of key engineering principles.
PLO13	13	Demonstrate understanding of and ability to use relevant materials, equipment, tools, processes, or products.
PLO14	14	Apply knowledge and understanding of workshop and laboratory practice.
PLO15	15	Use and apply information from technical literature.
PLO16	16	Use appropriate codes of practice and industry standards.
PLO17	17	Demonstrate an awareness of quality issues and their application to continuous improvement.
PLO18	18	Demonstrate an awareness of team roles and the ability to work as a member of an engineering team.
PLO19	19	Apply their skills in problem solving, communication, information retrieval, working with others and the effective use of general IT facilities.
PLO20	20	Plan self-learning and improve performance, as the foundation for lifelong learning and CPD.
PLO21	21	Plan and carry out a personal programme of work.
PLO22	22	Exercise personal responsibility, which may also be as a member of a team.
PLO23	23	Monitor, interpret and apply the results of analysis and modelling in order to bring about continuous improvement.
PLO24	24	Apply quantitative methods in order to understand the performance of systems and components.
PLO25	25	Use the results of engineering analysis to solve engineering problems and to recommend appropriate action.
PLO26	26	Apply an integrated or systems approach to engineering problems through know-how of the relevant technologies and their application.
PLO27	27	Demonstrate an awareness of business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics.
PLO28	28	Define a problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards.
PLO29	29	Work with information that may be incomplete or uncertain and be aware that this may affect the design.

Course Structure

Programme Structure Description	Students have the option to undertake a placement year. The placement year, module 5177CSD, will follow Level 5 and students will be enrolled on a 480 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 480 credit honours with study abroad programme. Of those 480 credits, 120 will be taken via a Level 5 study abroad module 5178CSD. 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 - 360 credit points	
Level 4 - 120 credit points	
Level 4 Core - 120 credit points	CORE
[MODULE] 4173CSD Design Principles Approved 2022.01 - 20 credit points	
[MODULE] 4174CSD Introduction to Electronics and Control Approved 2022.01 - 20 credit points	
[MODULE] 4175CSD The Digital Platform and Cyberspace Technology Approved 2022.01 - 20 credit points	
[MODULE] 4176CSD Designing Software Apps Approved 2022.01 - 20 credit points	
Level 5 - 120 credit points	
Level 5 Core - 120 credit points	CORE
[MODULE] 5171CSD Mobile Devices and Wireless Technology Approved 2022.01 - 20 credit points	
[MODULE] 5172CSD Sensor Technology Approved 2022.01 - 20 credit points	
[MODULE] 5173CSD Applied Electronics and Control Approved 2022.01 - 20 credit points	
[MODULE] 5174CSD AI and Machine Learning Approved 2022.01 - 20 credit points	
[MODULE] 5175CSD Internet of Things Approved 2022.01 - 20 credit points	
[MODULE] 5176CSD Smart Device Project Approved 2022.01 - 20 credit points	
Optional placement - 120 credit points	OPTIONAL
Placement Year - 120 credit points	OPTIONAL
[MODULE] 5177CSD Sandwich Year - Computing and Smart Devices Approved 2022.01 - 120 credit points	
OR Study Abroad - 120 credit points	OPTIONAL
[MODULE] 5178CSD Study Year Abroad - Computing and Smart Devices Approved 2022.01 - 120 credit points	
Level 6 - 120 credit points	
Level 6 Core - 120 credit points	CORE
[MODULE] 6106MECH Strategic Management Approved 2022.01 - 20 credit points	
[MODULE] 6171CSD Advanced and Embedded Sensors Approved 2022.01 - 20 credit points	
[MODULE] 6172CSD Smart Device Communications Approved 2022.01 - 20 credit points	

[MODULE] 6173CSD Big Data Analytics Approved 2022.01 - 20 credit points
[MODULE] 6175CSD Final Year Project Approved 2022.01 - 40 credit points

Approved variance from Academic Framework Regulations

Variance
Due to the COVID-19 pandemic, to better facilitate face-to-face learning, and to allow students further time to synthesise learning, modules 4174CSD and 5173CSD will be delivered year-long across both semesters during 2020-21.

Teaching, Learning and Assessment

Teaching, Learning and Assessment	Acquisition of underpinning knowledge is achieved mainly through lectures, tutorials, practical laboratory-based assignments and directed student-centred learning. Testing of the knowledge base is mainly undertaken through written assignments and practical laboratory reports. Engineering analysis is developed through lectures, case-studies and laboratory practice. Fundamental principles are delivered predominantly by lectures and laboratory classes. More advanced techniques are delivered by project work and group-based activities. Engineering analysis and problem solving skills are assessed through a combination of assignments and laboratory reports and project work. Design is taught through coursework, individual and group project work supported by an appropriate lecture and tutorial programme. Design skills are assessed through coursework, individual and group written project reports and presentation activities. Engineering practice is an inherent part of this academic programme and permeates almost every aspect of the course. Assessment of Engineering practice is carried out through a variety of activities, many of which are written and practical assignment based reports.

Opportunities for work related learning

Opportunities for work related learning
Students are encouraged and supported to find and undertake a year's industrial placement between Level 5 and 6. There is also further opportunity to undertake summer placements between academic years to gain valuable industrial experience. The work experience will help develop understanding of the work environment suitable for the programme and increase a student's professional practice.

Entry Requirements

Type	Description
Alternative qualifications considered	Applicants should have five GCSE (or equivalent) passes of at least grade C including Mathematics and English (or IELTS 6.0). 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.
BTECs	Applicants should obtain BTEC (QCF) Diploma or Extended Diploma grades DMM, UCAS 112 points equivalent in computing, IT, Electronics or similar related subjects.
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 80 points from mathematics, computing, IT, physics or other technical subjects.

Programme Contacts

Programme Leader

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Link Tutor

Contact Name