Programme Specification Document

Approved, 2022.04

Overview

Programme Code	35677-MG
Programme Title	Building Services Engineering
Awarding Institution	Liverpool John Moores University
Programme Type	Integrated Masters
Language of Programme	All LJMU programmes are delivered and assessed in English
Programme Leader	Badr Abdullah
Link Tutor(s)	

Awards

Award Type	Award Description	Award Learning Outcomes
Target Award	Master of Engineering - MG	See Learning Outcomes Below
Alternative Exit	Bachelor of Engineering with Honours - BGH	See 35677-BHG for learning outcomes
Alternative Exit	Diploma of Higher Education - DHE	Demonstrate knowledge and critical understanding of the well-established principles of Building Services Engineering, and of the way in which those principles have developed an ability to apply underlying concepts and principles outside the context in which they were first studied, including, where appropriate, the application of those principles in an employment context. Demonstrate knowledge of the main methods of enquiry in subject(s) relevant to Building Services Engineering, and ability to evaluate critically the appropriateness of different approaches to solving problems in this field of study. Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to effectively communicate information, arguments and analysis. Effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively. Undertake further training, develop existing skills and acquire new competences that will enable them to assume significant responsibility within organisations.
Alternative Exit	Certificate of Higher Education - CHE	Demonstrate a knowledge of the underlying concepts and principles associated with Building Services Engineering, and an ability to evaluate and interpret these within that context. Demonstrate an ability to present, evaluate and interpret qualitative and quantitative data, in order to develop lines of argument and make sound judgments in accordance with basic theories and concepts of Building Services Engineering. Evaluate the appropriateness of different approaches to solving problems related to Building Services Engineering. Communicate the results of their study accurately and reliably using structured and coherent arguments. Undertake further training and develop new skills within a structured and managed environment. Demonstrate the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility.
Alternative Exit	Bachelor of Engineering - BG	Demonstrate a broad and comparative knowledge of the general scope of the subject, its different areas and applications, and its interactions with related subjects. A detailed knowledge of a defined subject or a more limited coverage of a specialist area balanced by a wider range of study. In each case, specialised study will be informed by current developments in the subject. Demonstrate a critical understanding of the essential theories, principles and concepts of the subject(s) and of the ways in which these are developed through the main methods of enquiry in the subject.

Alternate Award Names	

External Benchmarks

Subject Benchmark Statement	UG-Engineering (2019)

Accreditation

Programme Accredited by

PSRB Name	Type of Accreditation	Valid From Date	Valid To Date	Additional Notes
Chartered Institution of Building Services Engineers (CIBSE)	Accredited by the Chartered Institute of Building Services Engineers (CIBSE) on behalf of the Engineering Council for the purposes of fully 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
Part-Time, Face to Face	September	LJMU Taught	7 Years

Aims and Outcomes

Educational Aims of the Programme

The overall aim of the programme is to develop knowledge, understanding and intellectual and practical skills appropriate to a variety of roles within the Building Services Engineering sector. The intention is to provide a stimulating and challenging programme of study that accurately reflects the activities in the Building Services Engineering industry and prepares students for effective, productive and responsible employment in the sector. The programme will offer the appropriate type and level of support as students build their knowledge, understanding and skills to become independent learners for the future. Since the programme has a bias towards providing students with engineering skills and knowledge and the design of engineering services systems for buildings, it is suited to those employed in or seeking employment in the design and consultancy arm of the Building Services Engineering industry. To facilitate study for employed students the programme is offered in part-time attendance mode. Students studying part-time whilst employed in the industry, will develop, in addition to those skills they acquire as part of the main programme, a range of skills and knowledge suitable for continued employment in the Building Services Engineering industry and higher levels of responsibility. The specific aims of the programme are to provide: 1. A programme of study in Building Services Engineering which facilitates acquisition of the essential skills and knowledge of the subject supported by industry. 2. The appropriate learning experiences to enable students to develop their skills and attitudes as independent researchers and innovative problem solvers to the fullest potential in the Building Services Engineering Sector. 3. An awareness of existing and future issues in the construction and property industry and how they are likely to impinge on the role and function of the Building Services Engineer. 4. Opportunities for development of the student's interpersonal and communication skills, with special reference to aspects of Engineering, Technology, Design and Management. 5. Opportunities for development of the student's professional attitude commensurate with that of the practicing Building Services professional and to permit them to specialise in selected areas of Building Services Engineering. 6. Raised awareness of the responsibilities of the Building Services professional in relation to sustainability, energy efficiency and environmental issues within the built environment. 7. To ensure that successful graduates will have the potential to contribute to significant advances in engineering and technological issues associated with their chosen industry. 8. To provide students with appropriate learning experiences to enable them to develop their skills and attitudes as independent researchers and innovative and creative problem solvers to the fullest possible potential in the Building Services Engineering sector. 9. To prepare students for the transition from Higher Education to employment within a professional context; and develop those transferable, specialist and employability skills that all stakeholders could reasonably expect of students who successfully complete a Building Services Engineering programme. 10. To encourage students to engage with the development of employability skills by completing a self-awareness statement.

Learning Outcomes

Code	Description
PLO1	Apply mathematical and scientific skills, including fundamental concepts, principles and theories that are relevant to the various disciplines within the Building Services Engineering industry.
PLO2	Apply appropriate Engineering solutions to real industrial needs using standard as well as specialist Building Services Engineering, commercial or construction computational tools and packages effectively.
PLO3	Work as an effective member of teams both within the Building Services Engineering disciplines and with the wider construction industry. Manage and evaluate individual and collective performance within teams.
PLO4	Manage the communication of data and information between the various participants in the design and construction process in a form which is relevant to its ultimate user.
PLO5	Use industry best practice procurement and managerial techniques.
PLO6	Develop a client's brief with regard to performance criteria and selection of appropriate Building Services Engineering solutions.

Code	Description
PLO7	Apply appropriate economic and environmental principles to Building Services Engineering design.
PLO8	Plan and record self-learning and development as the foundation for lifelong learning/CPD and Identify ways to improve their own learning.
PLO9	Work with knowledge in the relevant field, to develop new and appropriate solutions to the task as required.
PLO10	Use creativity and innovation in problem solving.
PLO11	Work with limited or contradictory information.
PLO12	Apply technical solutions to challenging design problems using appropriate mathematical techniques to evaluate complex concepts and theories.
PLO13	Apply appropriate legal, economic, design, environmental, business and management techniques that are relevant to Building Services Engineering and other professionals working within the construction and Building Services Engineering industries to prepare technical reports/drawings which underpin technical presentations.
PLO14	Demonstrate a detailed and comprehensive knowledge and critical understanding and awareness of the essential facts, concepts, principles, and theories relevant to the Building Services Engineering profession.
PLO15	Demonstrate an understanding of the limits of their knowledge of their own specialist area together with other associated engineering fields and how this influences analysis and interpretations based on that knowledge.
PLO16	Apply project management skills related to Building Services Engineering projects in the construction sector.
PLO17	Recognise all risk and ethical issues around a project and develop suitable mitigation and management practices for these issues.
PLO18	Critically evaluate the appropriateness of different approaches to solving problems.
PLO19	Critically analyse and integrate information and data from a variety of sources (surveys, reports, data, information, experimental results) and present it in a variety of ways

Programme Structure

Programme Structure Description

The programme is offered in part-time attendance mode. Entry to the programme is normally at level 4 for suitably qualified candidates, but entry may be offered to applicants at other levels dependent upon the applicant's prior qualifications (see "Admission" below). The part-time delivery pattern is typically as follows: Year 1 - 4334BEUG-Professional and Digital Skills for Engineers, 4333BEUG-Engineering Mathematics, 4331BEUG-Design Project 1 Year 2 - 4311BEUG-Introduction to Construction Technology, 4332BEUG-Electrical and Mechanical Engineering Principles, 4325BEUG-Science and Materials Year 3 - 5333BEUG-Mechanical Engineering for Buildings, 5335BEUG-Electrical Engineering for Buildings, 5341BEUG-Design Project 2, 5316BEUG-Procurement and Contracts Year 4 - 5337BEUG-Site Construction Management, 5339BEUG-Applied Mathematics, 5343BEUG-Work Based Learning, 6332BEUG-Environmental Analysis, 6338BEUG-Design Project 3 Year 5 - 6334BEUG-Commissioning and Facilities Management, 6336BEUG-Low Carbon Systems & Sustainability, 6340BEUG-Building Engineering Research Project (40 credits) Year 6 - 7303BEUG-Operational Performance and Modelling, 7305BEUG-Energy Engineering and Environment Year 7 - 7301BEUG-Sensors, Control and Applications, 7307BEUG-Building Engineering Research and Design Project (60 credits) The programme adheres to the University Academic Framework with 480 credits needed to achieve the MEng award in Building Services Engineering. Students who do not attain 480 credits may be eligible for alternative exit awards in accordance with the Academic Framework.

Programme Structure - 480 credit points	
Level 4 - 120 credit points	
Level 4 Core - 120 credit points	CORE
[MODULE] 4311BEUG Introduction to Construction Technology Approved 2022.01 - 20 credit points	
[MODULE] 4325BEUG Science and Materials Approved 2022.01 - 20 credit points	
[MODULE] 4331BEUG Design Project 1 Approved 2022.01 - 20 credit points	
[MODULE] 4332BEUG Electrical and Mechanical Engineering Principles Approved 2022.01 - 20 credit points	
[MODULE] 4333BEUG Engineering Mathematics Approved 2022.01 - 20 credit points	
[MODULE] 4334BEUG Professional and Digital Skills for Engineers Approved 2022.01 - 20 credit points	
Level 5 - 120 credit points	
Level 5 Core - 120 credit points	CORE
[MODULE] 5316BEUG Procurement and Contracts Approved 2022.01 - 20 credit points	
[MODULE] 5333BEUG Mechanical Engineering for Buildings Approved 2022.01 - 20 credit points	
[MODULE] 5335BEUG Electrical Engineering for Buildings Approved 2022.01 - 20 credit points	
[MODULE] 5337BEUG Site Construction Management Approved 2022.03 - 20 credit points	
[MODULE] 5339BEUG Applied Mathematics Approved 2022.01 - 10 credit points	
[MODULE] 5341BEUG Design Project 2 Approved 2022.01 - 20 credit points	
[MODULE] 5343BEUG Work Based Learning Approved 2022.02 - 10 credit points	
Level 6 - 120 credit points	
Level 6 Core - 120 credit points	CORE
[MODULE] 6332BEUG Environmental Analysis Approved 2022.01 - 20 credit points	
[MODULE] 6334BEUG Commissioning and Facilities Management Approved 2022.01 - 20 credit points	
[MODULE] 6336BEUG Low Carbon Systems and Sustainability Approved 2022.03 - 20 credit points	
[MODULE] 6338BEUG Design Project 3 Approved 2022.01 - 20 credit points	

[MODULE] 6340BEUG Building Engineering Research Project Approved 2022.01 - 40 credit points	
Level 7 - 120 credit points	
Level 7 Core - 120 credit points	CORE
[MODULE] 7301BEUG Sensors, Control and Applications Approved 2022.01 - 20 credit points	
[MODULE] 7303BEUG Operational Performance and Modelling Approved 2022.01 - 20 credit points	
[MODULE] 7305BEUG Energy Engineering and Environment Approved 2022.01 - 20 credit points	
[MODULE] 7307BEUG Building Engineering Research and Design Project Approved 2022.01 - 60 credit points	

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

Teaching, Learning and Assessment

The programme will be delivered using a mixture of lectures, tutorials, workshops, laboratory practical classes and design studio sessions. All aspects of the programme will seek to develop vocationally relevant skills and knowledge. Assessment will be carried out using a mixture of examinations and coursework; specifically assessments could consist of formal unseen examinations, in-class open book tests, online multiple choice tests, technical and/or research based written reports, and simulated design projects.

Opportunities for work related learning

The part-time course is designed specifically for students in employment in the Building Services industry. The modules and assessments have been carefully planned to mimic real projects that the student would encounter in the workplace. Work related learning is included within the programme, so students will have the opportunity to engage in real work projects and activities. In doing so, students will be able to apply their knowledge and employability skills in a 'world of work' context. Having experience of the workplace and current issues is incredibly valuable in developing career aims and when applying for future employment. Work-related learning may take different forms, the most common being: work placements, internships, simulations of workplace activity and employer-driven case studies. As part time students, the application of their work experience is expected to be applied in differing work contexts through simulations and scenario based assessments. The programme has active links with industry and involves employers in the projects modules at each level of the programme. Real world case studies are used wherever possible.

Entry Requirements

Type	Description
BTECs	128 UCAS points
Other international requirements	Overseas student applicants must have the equivalent qualifications as UK students. In addition they must have achieved an IELTS score of at least 6.

Alternative qualifications considered	Foundation degree from LJMU Partner College Level 6 entry: Foundation Degree in Building Services Engineering (electrical or mechanical route) from a LJMU partner college with a mean award mark of at least 40%. Foundation degree from other institutions Level 5 entry: Foundation Degree in Building Services Engineering or other related subject discipline from other institutions with a mean award mark of at least 40%. Progression from LJMU BEng (Hons) Building Services Engineering Level 6 entry: available for LJMU students who have completed level 5 LJMU BEng in Building Services Engineering with a capped mean mark from all level 5 modules of at least 55%. 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
NVQ	HNC/HND (Non-cognate) Level 4 Entry: Pass HNC/HND (Cognate) Level 4 Entry: Pass HNC (Cognate) Level 5 Entry: Pass HND (Cognate) Level 6 Entry: Pass
A levels	128 UCAS points: Minimum Two A2 levels (Inc. Maths, Physics, Chemistry or Biology)
International Baccalaureate	Level 4: 128 UCAS tariff points

Extra Entry Requirements