

## Overview

<b>Programme Code</b>	33140
<b>Programme Title</b>	Building Services Engineering
<b>Awarding Institution</b>	Liverpool John Moores University
<b>Programme Type</b>	Integrated Masters
<b>Language of Programme</b>	All LJMU programmes are delivered and assessed in English
<b>Programme Leader</b>	Badr Abdullah
<b>Link Tutor(s)</b>	

## Awards

Award Type	Award Description	Award Learning Outcomes
Target Award	Master of Engineering - MG	See Learning Outcomes Below
Recruitable Target	Bachelor of Engineering with Honours - BGH	See Learning Outcomes Below
Recruitable Target	Bachelor of Engineering Honours (SW) - SBGH	See Learning Outcomes Below
Recruitable Target	Master of Engineering (SW) - SMG	See Learning Outcomes Below
Alternative Exit	Bachelor of Engineering with Honours - BGH	Demonstrate a systematic understanding of key aspects of Building Services Engineering, including acquisition of coherent and detailed knowledge, at least some of which is at, or informed by, the forefront of defined aspects of the discipline. Demonstrate an ability to deploy accurately established techniques of analysis and enquiry within the discipline. Demonstrate a conceptual understanding that enables the student to devise and sustain arguments, and/or to solve problems, using ideas and techniques, some of which are at the forefront of the Building Services Engineering discipline, and to describe and comment upon particular aspects of current research, or equivalent advanced scholarship, in the discipline. Demonstrate an appreciation of the uncertainty, ambiguity and limits of knowledge within the Building Services Engineering discipline. Demonstrate an ability to manage their own learning, and to make use of scholarly reviews and primary sources (for example, refereed research articles and/or original materials appropriate to the discipline).
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	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.
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Alternate Award Names	
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## External Benchmarks

Subject Benchmark Statement	UG-Engineering (2019)
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## 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 an Incorporated Engineer and partially 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
Full-Time, Face to Face	September	LJMU Taught	4 Years
Sandwich Year Out, Face to Face	September	LJMU Taught	5 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 as well as full-time attendance mode. Students participating in the Sandwich placement option will develop, in addition to those skills they acquire as part of the main programme, a range of skills and knowledge suitable for immediate employment in the Building Services Engineering industry. 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 that are relevant to the various disciplines within the Building Services Engineering industry.

Code	Description
PLO2	Critically evaluate the appropriateness of different approaches to solving problems.
PLO3	Critically analyse and evaluate complex concepts and theories.
PLO4	Critically analyse and integrate information and data from a variety of sources.
PLO5	Apply appropriate Engineering solutions to real industrial needs.
PLO6	Use standard as well as specialist building services engineering, commercial or construction computational tools and packages effectively.
PLO7	Analyse surveys, reports, data, information and experimental results accurately.
PLO8	Prepare technical reports/drawings appropriate for a range of technical and non-technical purposes.
PLO9	Make technical presentations to specialist and non-specialist audiences.
PLO10	Use construction and building services engineering literature effectively.
PLO11	Work as an effective member of a team.
PLO12	Apply the fundamental concepts, principles and theories of Building Services Engineering.
PLO13	Use appropriate mathematical methods for analysing Building Services Engineering problems.
PLO14	Use industry best practice procurement and managerial techniques.
PLO15	Take a leading role in commerce and industry in a range of situations.
PLO16	Develop a client's brief with regard to performance criteria and selection of appropriate Building Services Engineering solutions.
PLO17	Use information and communication technology to generate and manage project information.
PLO18	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.
PLO19	Apply appropriate economic and environmental principles to Building Services Engineering design.
PLO20	Identify ways to improve their own learning.
PLO21	Use information and communications technology effectively.
PLO22	Manage resources and time effectively.
PLO23	Apply appropriate legal, economic, design, environmental business and management techniques that are relevant to Building Services Engineers and other professionals working within the construction and building services industries.
PLO24	Transfer techniques and solutions from one field of engineering to another.
PLO25	Manipulate and sort data.
PLO26	Present data in a variety of ways.
PLO27	Use scientific evidence based methods in the solution of problems.

Code	Description
PLO28	Use creativity and innovation in problem solving.
PLO29	Work with limited or contradictory information.
PLO30	Develop their own communication skills.
PLO31	Demonstrate team-working and leadership skills.
PLO32	Work effectively with others.
PLO33	Demonstrate a detailed knowledge and critical understanding of the essential facts, concepts, principles and theories relevant to the Building Services Engineering profession.
PLO34	Apply technical solutions to complex design problems.
PLO35	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.
PLO36	Apply project management skills related to Building Services Engineering projects in the construction sector.
PLO37	Apply the legal, economic, design, environmental, business and management techniques that are relevant to Building Services Engineers and other professionals working within the construction industry.
PLO38	Identify and solve complex problems.

## Programme Structure

### Programme Structure Description

The programme is offered in full-time and full-time sandwich attendance modes. Entry to the programme is normally at level 4 for suitably qualified candidates. The programme will offer the opportunity of 60 credits of study abroad at Level 5. Students will be enrolled on a 480 credit honours with study abroad programme. A 60 credit Level 5 study abroad module [5300BESASE] will normally replace the semester 2 modules on the standard programme. This study abroad should cover the same learning outcomes as the modules being replaced. The modules to be studied in the host institution must be agreed in advance. The Level 5 mean for the final award will be calculated based upon the 120 credits at Level 5. Students have the option to undertake a placement year. The placement year, module 5200BESWSE, will follow Level 5 and students will be enrolled on a 600 credit 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 the 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 5200BESASE. 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. 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] 4200BEUG Construction Technology 1 Approved 2022.01 - 20 credit points	
[MODULE] 4201BEUG Collaborative Interdisciplinary Project 1 Approved 2022.02 - 10 credit points	
[MODULE] 4204BEUG Science and Materials Approved 2022.01 - 20 credit points	
[MODULE] 4205BEUG Academic and Digital Literacy Approved 2022.01 - 10 credit points	
[MODULE] 4215BEUG Building Services Engineering Project 1 Approved 2022.01 - 20 credit points	
[MODULE] 4216BEUG Engineering Principles Approved 2022.01 - 20 credit points	
[MODULE] 4227BEUG Engineering Mathematics Approved 2022.01 - 20 credit points	
Level 5 - 120 credit points	
Level 5 Core - 120 credit points	CORE
[MODULE] 5202CIV Applied Mathematics Approved 2022.01 - 10 credit points	
[MODULE] 5216BEUG Mechanical Engineering for Buildings Approved 2022.01 - 20 credit points	
[MODULE] 5217BEUG Electrical Engineering for Buildings Approved 2022.01 - 20 credit points	
[MODULE] 5218BEUG Building Services Engineering Project 2 Approved 2022.01 - 20 credit points	
[MODULE] 5220BEUG Site Production Management Approved 2022.02 - 20 credit points	
[MODULE] 5221BEUG Building Engineering Collaborative Project 2 Approved 2022.01 - 20 credit points	
[MODULE] 5223BEUG Building Engineering Research Methods Approved 2022.01 - 10 credit points	
Optional placement - 120 credit points	OPTIONAL
Placement Year - 120 credit points	OPTIONAL
[MODULE] 5200BESWSE Sandwich Year - Building Services Engineering Approved 2022.01 - 120 credit points	

<b>OR Study Abroad - 120 credit points</b>	<b>OPTIONAL</b>
[MODULE] 5200BESASE Study Year Abroad - Building Services Engineering Approved 2022.01 - 120 credit points	
<b>Optional Study Semester - 60 credit points</b>	<b>OPTIONAL</b>
[MODULE] 5300BESASE Study Semester Abroad - Building Services Engineering Approved 2022.01 - 60 credit points	
<b>Level 6 - 120 credit points</b>	
<b>Level 6 Core - 120 credit points</b>	<b>CORE</b>
[MODULE] 6220BEUG Construction Site Management Approved 2022.02 - 20 credit points	
[MODULE] 6221BEUG Environmental Analysis Approved 2022.01 - 20 credit points	
[MODULE] 6222BEUG Buildings, Energy and Sustainability Approved 2022.01 - 20 credit points	
[MODULE] 6223BEUG Building Services Engineering Project 3 Approved 2022.01 - 20 credit points	
[MODULE] 6226BEUG Building Engineering Research Project Approved 2022.01 - 40 credit points	
<b>Level 7 - 120 credit points</b>	
<b>Level 7 Core - 120 credit points</b>	<b>CORE</b>
[MODULE] 7200BEUG Energy and Environment Approved 2022.01 - 20 credit points	
[MODULE] 7201BEUG Commissioning, Maintenance and Facilities Management Approved 2022.01 - 20 credit points	
[MODULE] 7202BEUG Sensors, Control and Applications Approved 2022.01 - 20 credit points	
[MODULE] 7204BEUG 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.

## Entry Requirements

Type	Description
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



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 55%. 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 55%. Progression from LJMU B.Eng. 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%.
A levels	128 UCAS points: Minimum Two A2 levels (Inc. Maths, Physics, Chemistry or Biology)
International Baccalaureate	Level 4: 128 UCAS tariff 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.
BTECs	128 UCAS points

### Extra Entry Requirements