

## Overview

<b>Programme Code</b>	35558
<b>Programme Title</b>	Civil and Structural 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>	Denise Lee
<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	Master of Engineering (SW) - SMG	See Learning Outcomes Below
Alternative Exit	Diploma of Higher Education - DHE	Apply the analytical and evaluation skills attained to a deeper knowledge of the principles and concepts of civil engineering and related subjects. Students will also be able to apply these principles widely within the context of the civil engineering profession. Critically evaluate the appropriateness of different approaches to design and problem solving within civil engineering.
Alternative Exit	Bachelor of Engineering with Honours - BGH	Analyse and evaluate a complex body of knowledge, some of which will be at the current boundaries of civil engineering. Exercise personal responsibility and decision making in complex circumstances. Students will have developed strategic awareness, independent research skills, and a detailed knowledge of civil engineering related subjects together with confidence in applying quantitative and qualitative models. Make use of the theoretical knowledge base to produce effective civil engineering designs, taking full account of the requirements of sustainability, Health and Safety and risk management. Demonstrate the professional and personal skills necessary for effective employment within a professional environment.
Alternative Exit	Certificate of Higher Education - CHE	Demonstrate a sound knowledge of the basic concepts of civil engineering related subjects and have learned how to take different approaches to solving engineering problems.
Alternative Exit	Diploma in Higher Education (SW) - SDHE	Apply the analytical and evaluation skills attained to a deeper knowledge of the principles and concepts of civil engineering and related subjects. Students will also be able to apply these principles widely within the context of the civil engineering profession. Critically evaluate the appropriateness of different approaches to design and problem solving within civil engineering. For the award of Diploma of Higher Education (SW), students must also demonstrate the professional and personal skills necessary for effective employment within a professional environment.
Alternative Exit	Bachelor of Engineering Honours (SW) - SBGH	Analyse and evaluate a complex body of knowledge, some of which will be at the current boundaries of civil engineering. Exercise personal responsibility and decision making in complex circumstances. Students will have developed strategic awareness, independent research skills, and a detailed knowledge of civil engineering related subjects together with confidence in applying quantitative and qualitative models. Make use of the theoretical knowledge base to produce effective civil engineering designs, taking full account of the requirements of sustainability, Health and Safety and risk management. For the award of Bachelor of Engineering Honours (SW), students must also demonstrate the professional and personal skills necessary for effective employment within a professional environment.

**Alternate Award Names****External Benchmarks****Subject Benchmark Statement**

UG-Engineering (2019)

**Accreditation****Programme Accredited by**

<b>PSRB Name</b>	<b>Type of Accreditation</b>	<b>Valid From Date</b>	<b>Valid To Date</b>	<b>Additional Notes</b>
Chartered Institute of Highways and Transportation (CIHT)	Accredited by the Chartered Institution of Highways and Transportation (CIHT) on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as a Chartered Engineer.			
Institution of Civil Engineers (ICE)	Accredited by the Institution of Civil Engineers (ICE) on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as a Chartered Engineer.			
Institution of Structural Engineers (IStructE)	Accredited by the Institution of Structural Engineers (IStructE) on behalf of the Engineering Council for the purposes of 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
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 in Civil and Structural Engineering is designed to develop a high level of technical expertise together with the leadership skills needed to practice successfully as a professional engineer in the modern international civil engineering environment. The knowledge and skills gained from this programme are designed to enable graduates to make an immediate contribution to their employers, and to enable them to achieve the highest positions within the civil and structural engineering profession. The educational aims of the MEng in Civil and Structural Engineering are to: Provide a programme of study that fully meets the academic requirement for registration as a Chartered Engineer. Provide a programme of study, which develops core knowledge, and understanding of engineering principles, mathematics and computation, appropriate to the field of Civil Engineering. Enable students to develop specialist knowledge, intellectual, analytical, practical and critical abilities that will enable them to analyse, investigate and develop robust solutions to Civil 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. Provide a degree programme which meets the accreditation requirements of AHEP-4 UK Spec and the needs of industry. Develop students to work in and manage teams and also to work independently at managerial level utilizing 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. Civil and Structural Engineering graduates are concerned with the structural design of large buildings and infrastructure such as bridges. Civil and Structural Engineering graduates can choose to work in a design office where they will apply high level numeracy and design skills to practical design projects. They need detailed knowledge and understanding of structures, hydraulics, geotechnics and materials used in construction. They need to have skills such as setting out, land surveying and computer aided design.

### Learning Outcomes

Code	Description
PLO1	Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Knowledge will be informed promoting a critical awareness of new developments in Civil and Structural engineering.
PLO2	Work effectively within a group to design, analyse and evaluate Civil and Structural Engineering projects, adopting an inclusive approach and recognising the responsibilities, benefits and importance of supporting equality, diversity and inclusivity.
PLO3	Apply practical engineering skills acquired through laboratory work, to the design of complex civil engineering projects.

<b>Code</b>	<b>Description</b>
PLO4	Use a range of land surveying equipment effectively for setting out engineering works and for collecting site data for the production of engineering plans.
PLO5	Exercise initiative and ethical personal responsibility both as a leader and as a team member.
PLO6	Plan and record CPD for personal and professional development.
PLO7	Apply an extensive knowledge and understanding of a wide range of engineering materials and components to civil and structural engineering design.
PLO8	Develop specifications for materials and methods to ensure quality of engineering design solution and its construction.
PLO9	Develop planning and control project schedules with regard to Civil and Structural Engineering project management principles, commercial and legal aspects.
PLO10	Ability to write original technical and research reports in compliance to relevant intellectual property and copyrights.
PLO11	Communicate effectively through the written word, engineering drawings, clear use of mathematic notation, orally and through effective use of IT.
PLO12	Formulate and analyse complex Civil and Structural Engineering problems by collecting, processing and inferring relevant data, facts and information, and by using first principle mathematics, statistics, applied science and engineering principles.
PLO13	Evaluate and design structures exposed to dynamic loads.
PLO14	Develop extensive knowledge and understanding of the behaviour of large structures to carry out their design.
PLO15	Demonstrate a wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them to unfamiliar situations.
PLO16	Manage the design process and evaluate outcomes.
PLO17	Select and apply appropriate computational and analytical techniques to simulate complex Civil and Structural Engineering systems for planning, designing and construction, with due regard to the limitations of the techniques and scope of applications employed.
PLO18	Develop a methodology based on the critical evaluation of technical literature, using qualitative and quantitative data to provide recommendations to bring improvement aligned with UN SDG's, through independent research.
PLO19	Design innovative solutions in accordance with current appropriate codes of practice and industry standards.
PLO20	Demonstrate professional and ethical behaviour with regard to Civil and Structural Engineering, involving consideration of Health and Safety, diversity, inclusion, cultural, societal, environmental and commercial matters
PLO21	Demonstrate knowledge of the holistic nature of Civil and Structural Engineering projects and the wider impact on the society, economy and environment. This will include BIM and life cycle analysis.
PLO22	Develop an awareness and the ability to identify ethical concerns and to make reasoned and justified ethical choices.

<b>Code</b>	<b>Description</b>
PLO23	Evaluate and mitigate risk, including environmental, commercial and security risk associated with Civil and Structural Engineering projects.

## 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. Students have the option to undertake a placement year. The placement year, module 5200CIVSW, 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 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 5200CIVSA. 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. This version of the programme applies to all new and existing students with the exception of those starting level 7 in September 2022 who will continue on the previously validated version.

<b>Programme Structure - 480 credit points</b>	
<b>Level 4 - 120 credit points</b>	
<b>Level 4 Core - 120 credit points</b>	<b>CORE</b>
[MODULE] 4300CIV Engineering Mathematics I Approved 2022.02 - 20 credit points	
[MODULE] 4301CIV Structural Analysis and Design I Approved 2022.02 - 20 credit points	
[MODULE] 4302CIV Introduction to Materials I Approved 2022.01 - 10 credit points	
[MODULE] 4303CIV Surveying and CAD Approved 2022.01 - 20 credit points	
[MODULE] 4304CIV Geotechnics I Approved 2022.02 - 20 credit points	
[MODULE] 4305CIV Hydraulics Approved 2022.01 - 10 credit points	
[MODULE] 4306CIV Infrastructure Design and Skills Project Approved 2022.01 - 20 credit points	
<b>Level 5 - 120 credit points</b>	
<b>Level 5 Core - 120 credit points</b>	<b>CORE</b>
[MODULE] 5300CIV Materials II Approved 2022.02 - 20 credit points	
[MODULE] 5301CIV Surveying and Transportation Approved 2022.02 - 20 credit points	
[MODULE] 5302CIV Engineering Mathematics II Approved 2022.01 - 10 credit points	
[MODULE] 5303CIV Geotechnics II Approved 2022.01 - 10 credit points	
[MODULE] 5304CIV Water Engineering Approved 2022.01 - 20 credit points	
[MODULE] 5305CIV Structural Analysis and Design II Approved 2022.02 - 20 credit points	
[MODULE] 5306CIV Civil Engineering Project Approved 2022.01 - 20 credit points	
<b>Optional placement - 120 credit points</b>	<b>OPTIONAL</b>
<b>Placement Year - 120 credit points</b>	<b>OPTIONAL</b>
[MODULE] 5200CIVSW Sandwich Year - Civil Engineering Approved 2022.01 - 120 credit points	
<b>OR Study Abroad - 120 credit points</b>	<b>OPTIONAL</b>
[MODULE] 5200CIVSA Study Year Abroad - Civil Engineering Approved 2022.01 - 120 credit points	
<b>Level 6 - 120 credit points</b>	
<b>Level 6 Core - 120 credit points</b>	<b>CORE</b>
[MODULE] 6300CIV Advanced Materials Approved 2022.01 - 10 credit points	
[MODULE] 6301CIV Transportation and Infrastructure Approved 2022.01 - 10 credit points	
[MODULE] 6302CIV Applied Geotechnics and Design Approved 2022.02 - 20 credit points	
[MODULE] 6303CIV Structural Design and Risk Management Approved 2022.01 - 20 credit points	

[MODULE] 6304CIV Research Project Approved 2022.02 - 40 credit points	
[MODULE] 6305CIV Water Supply and Wastewater Management Approved 2022.02 - 20 credit points	
<b>Level 7 - 120 credit points</b>	
<b>Level 7 Core - 120 credit points</b>	<b>CORE</b>
[MODULE] 7300CIV Engineering Design Project Approved 2022.01 - 60 credit points	
[MODULE] 7303CIV Structural and Earthquake Engineering Approved 2022.02 - 20 credit points	
[MODULE] 7304CIV Applied Finite Element Analysis Approved 2022.01 - 20 credit points	
[MODULE] 7306CIV Advanced Structural Design and Bridge Engineering 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

There is an approved variance for this programme: Level 7 Engineering Design Project module is approved as a 60 credit module, and it is approved to run year long.

## Teaching, Learning and Assessment

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. Student-centred learning will be delivered through, tutorials, seminars and workshops, laboratory and computer sessions. There will also be off-site learning through surveying field course and site visits. 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.

## Opportunities for work related learning

To put the students' learning into appropriate vocational contexts project modules at all levels are assessed in realistic, industrially relevant contexts. At each level of the course students participate in cross disciplinary project modules and a major design project in the final year, mentored by industry, develops this. The full-time course is offered in sandwich mode so that after two years of study, students may elect to work in a design and/or consultancy practice or with a contractor for a one year placement. This would afford students the opportunity to contextualise their theoretical learning in a real life working environment.



## Entry Requirements

Type	Description
Alternative qualifications considered	Foundation degree Level 5 entry: Foundation Degree in Civil Engineering with a final award mark of at least 65%. Progression from LJMU B.Eng. in Civil Engineering Level 6 entry: available for LJMU students who have completed level 5 LJMU B.Eng. in Civil Engineering with a capped mean mark from all level 5 modules of at least 55%.
NVQ	HNC/HND (Cognate) Level 4 Entry: Pass Level 5 Entry: Pass with an average mark of at least 65%
A levels	Level 4: 128 UCAS points: Minimum Two A2 levels. Science and maths subjects are preferred but not essential for A-Levels and including GCSE/O-level standard requirements.
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.
International Baccalaureate	27 IB points

### Extra Entry Requirements