

PROGRAMME SPECIFICATION

Master of Engineering in Civil and Structural Engineering

Awarding institution	Liverpool John Moores University
Teaching institution	LJMU
UCAS Code	6A12
JACS Code	H200
Programme Duration	Full-Time: 4 Years, Sandwich Thick: 5 Years
Language of Programme	All LJMU programmes are delivered and assessed in English
Subject benchmark statement	Engineering (2015)
Programme accredited by	Joint Board of Moderators (JBM) on behalf of: the Institution of Civil Engineers (ICE), the Institution of Structural Engineers (IStructE), the Chartered Institution of Highways and Transportation (CIHT) and the Institute of Highway Engineers (IHE).
Description of accreditation	This degree is accredited as fully meeting the academic requirements for registration as a Chartered Engineer.
Validated target and alternative exit awards	Master of Engineering in Civil and Structural Engineering Master of Engineering (SW) in Civil and Structural Engineering
Programme Leader	Edward Loffill

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 well-balanced education which allows the student to achieve his/her full academic potential and in doing so to facilitate the development of independent logical thought and judgement.

Enable the student to develop his/her intellectual, analytical and critical abilities in order that he/she might exercise those abilities within civil and structural engineering.

Deliver an educational experience for the students which enables them to develop their knowledge of those scientific, mathematical and computational principles and methods relevant to civil and structural engineering.

Develop the students' ability to apply engineering concepts and tools to the solution of civil and structural engineering problems.

Facilitate the development of design capability, from the understanding of customer needs through to the development and evaluation of innovative designs.

Encourage and enable students to develop the full range of communication skills.

Enable students to solve technical and intellectual challenges within the field of civil and structural engineering, taking into

consideration business, social, ethical and sustainability issues.

Provide the opportunities for students to combine theory with practice through the practical application of engineering skills.

Provide graduates with a range of highly relevant transferable skills such as team working, problem solving, self-learning as a foundation for lifelong CPD, and the ability to exercise initiative and personal responsibility.

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.

Develop skills to ensure that the graduate will operate within a sound Health and Safety framework as provided by the regulatory framework of the industry.

Develop critical awareness of all aspects of sustainability to ensure that graduates operate responsibly within their chosen discipline, and make positive choices in this context.

Encourage students to engage with the development of employability skills by completing a self-awareness statement.

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.

Target award Learning Outcomes - Master of Engineering

A student successfully completing the programme of study will have acquired the following subject knowledge and understanding as well as skills and other attributes.

A student who is eligible for this award will be able to:

1. Demonstrate their knowledge and understanding of essential facts, concepts, theories and principles of civil engineering, and its underpinning science and mathematics.
2. Demonstrate their knowledge and understanding of historical, current and future developments and technologies within civil and structural engineering.
3. Apply a range of mathematical and statistical methods in the solution of civil and structural engineering problems and demonstrate an understanding of their limitations.
4. Demonstrate an understanding of concepts from a range of areas including some outside engineering, and the ability to apply them effectively in civil and structural engineering projects.
5. Demonstrate an understanding of relevant codes of practice and the regulatory framework.
6. Demonstrate an understanding of construction materials, including novel and innovative materials.
7. Demonstrate their understanding of the international nature of civil and structural engineering and apply this to the design and evaluation of civil engineering projects.
8. Demonstrate an understanding of Building Information Management (BIM).
9. Demonstrate their knowledge and understanding of risk assessment and risk management methods.
10. Analyse a wide range of structures.
11. Apply advanced problem solving skills, technical knowledge and understanding, to establish rigorous and creative solutions that are fit for purpose for all aspects of a problem.
12. Evaluate risk issues, including environmental and commercial risk.
13. Demonstrate an extensive knowledge and understanding of management and business practices, and their limitations, and how these may be applied appropriately to strategic and tactical issues.
14. Demonstrate an understanding the requirement for engineering activities to promote sustainable development.
15. Demonstrate an awareness of the framework of relevant legal and quality requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues.
16. Identify and classify the performance of systems, and apply a systems approach to solving complex problems.
17. Undertake and evaluate research and communicate the results of the research.
18. Use a range of land surveying equipment effectively for setting out engineering works and for collecting site data for the production of engineering plans.
19. Design a wide range of structures to industry standard codes of practice.
20. Apply practical engineering skills acquired through, for example, work carried out in laboratories, to the design of civil engineering projects.
21. Work effectively within a group to design, analyse and evaluate civil engineering projects.
22. Demonstrate a thorough understanding of current and developing civil engineering practice and its limitations and some appreciation of likely new developments.

23. Apply an extensive knowledge and understanding of a wide range of engineering materials and components to civil engineering design.
24. Demonstrate a wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations.
25. Illustrate an understanding of client and user needs and the importance of considerations such as aesthetics.
26. Evaluate the sustainability of a civil engineering project, and design effectively within the constraints of the 'triple bottom line' (social, environmental and economic).
27. Generate an innovative design for construction, products, systems, components or processes to fulfil new needs.
28. Demonstrate an understanding of the need for a high level of professional and ethical conduct in civil engineering and a knowledge of professional codes of conduct.
29. Manage the design process and evaluate outcomes.
30. Apply their skills in problem solving, communication, and working with others, as well as the effective use of general IT facilities and information retrieval skills.
31. Use technical literature and other information sources effectively.
32. Demonstrate entrepreneurial competencies to include creativity, personal influence, personal branding and negotiation
33. Exercise initiative and ethical personal responsibility both as a leader and as a team member.
34. Plan self-learning and improve performance, as the foundation for lifelong learning.
35. Work with limited or contradictory information.
36. Communicate effectively through the media of the written word, engineering drawings, clear use of mathematical notation, orally and through the effective use of IT.
37. Monitor and adjust a personal programme of work.

Alternative target awards

A student who is eligible for the following awards will be able to:

Master of Engineering (SW) in Civil and Structural Engineering -

Achieve the same learning outcomes as for the target award, and demonstrate the professional and personal skills necessary for effective employment within a professional environment. The industrial training year takes place at the end of Level 5. Employment on industrial placement must be with an approved civil engineering company or organisation. Each student is allocated an industrial training tutor, who visits the work place and monitors their progress.

Teaching, Learning and Assessment

The methods used to enable outcomes to be achieved and demonstrated are as follows:

Teaching includes lectures, tutorials, problem solving sessions, seminars, workshops, laboratory and computer sessions, off-site learning activities (including a surveying field course), participation in a group projects. Case studies from industry practitioners, and the use of real examples from within civil engineering, add to the student knowledge and understanding. Specific work based modules will require the students to analyse and comment on their own work experiences and the techniques and practices to which they are exposed. The main vehicle for the skills development will be through the projects which involve verbal and visual presentations to a panel of experts, backed up by written reports. The major vehicles for practical skills are laboratory work, field work including the surveying field course week, and the research project at level 6.

Assessment is by a combination of unseen examinations, open book examinations, assignments, preparation of reports, design tasks, oral presentations, visual presentations, workshops, peer review, computer-based exercises, work placement reports.

Programme structure - programme rules and modules

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.

Students who fail to attain the target award will be transferred to the BEng (Hons) in Civil Engineering.

Level 7	Potential Awards on completion	Master of Engineering
Core	Option	Award Requirements
7202CIV ENGINEERING DESIGN PROJECT (60 credits) 7203CIV ANALYSIS AND DESIGN OF LARGE STRUCTURES (20 credits) 7204CIV APPLIED FINITE ELEMENT ANALYSIS (20 credits) 7326BEPG STRUCTURAL AND EARTHQUAKE ENGINEERING (20 credits)		120 core credits at level 7 0 option credits at level 7
Level 6	Potential Awards on completion	
Core	Option	Award Requirements
6200CIV ADVANCED MATERIALS, RIVER AND COASTAL ENGINEERING (20 credits) 6201CIV INFRASTRUCTURE, HIGHWAYS DESIGN AND INNOVATION (20 credits) 6202CIV ADVANCED GEOTECHNICS AND DESIGN (20 credits) 6203CIV STRUCTURAL DESIGN AND RISK MANAGEMENT (20 credits) 6205CIV RESEARCH PROJECT (40 credits)		120 core credits at level 6 0 option credits at level 6
Level 5	Potential Awards on completion	
Core	Option	Award Requirements
5200CIV MATERIALS (20 credits) 5201CIV SURVEYING, HIGHWAYS AND TRANSPORTATION (20 credits) 5202CIV APPLIED MATHEMATICS (10 credits) 5203CIV GEOTECHNICS (10 credits) 5204CIV WATER ENGINEERING (20 credits) 5205CIV STRUCTURAL ANALYSIS AND DESIGN (20 credits)	5206CIV CIVIL ENGINEERING PROJECT (20 credits) 5207CIV WORK BASED LEARNING (20 credits)	100 core credits at level 5 20 option credits at level 5
Level 4	Potential Awards on completion	
Core	Option	Award Requirements
4200CIV ENGINEERING MATHEMATICS (20 credits) 4201CIV STRUCTURES AND MATERIALS (20 credits) 4202CIV INFRASTRUCTURE (10 credits) 4203CIV SURVEYING AND CAD (20 credits) 4204CIV INTRODUCTION TO GEOTECHNICS (20 credits)		120 core credits at level 4 0 option credits at level 4

4205CIV HYDRAULICS (10 credits) 4206CIV DESIGN AND SKILLS PROJECT (20 credits)		
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Information about assessment regulations

All programmes leading to LJMU awards operate within the University's Academic Framework.
<https://www.ljmu.ac.uk/about-us/public-information/academic-quality-and-regulations/academic-framework>

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.

Opportunities for work-related learning (location and nature of activities)

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.

Criteria for admission

A/AS Level

Level 4: 128 UCAS points: Minimum Two A2 levels

Irish Leaving Certificate

Level 4 : 128 UCAS points; minimum 3 subjects at Higher level

Scottish Higher

Level 4 : 128 UCAS points; minimum 2 subjects at Advanced Higher level

International Baccalaureate

27 IB points

Higher national diploma

HNC/HND (Cognate)

Level 4 Entry: Pass

Level 5 Entry: Pass with an average mark of at least 65%

Other

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%.

Overseas qualifications

Overseas student applicants must have the equivalent qualifications as UK students. In addition they must have achieved an IELTS score of at least 6.

External Quality Benchmarks

All programmes leading to LJMU awards have been designed and approved in accordance with the UK Quality Code for Higher Education, including the Framework for Higher Education Qualifications in the UK (FHEQ) and subject benchmark statements where applicable.

The University is subject to periodic review of its quality and standards by the Quality Assurance Agency (QAA) Published review reports are available on the QAA website at www.qaa.ac.uk

Programmes which are professionally accredited are reviewed by professional, statutory and regulatory bodies (PSRBs) and such programmes must meet the competencies/standards of those PSRBs.

Support for students and their learning

The University aims to provide students with access to appropriate and timely information, support and guidance to ensure that they are able to benefit fully from their time at LJMU. All students are assigned a Personal Tutor to provide academic support and when necessary signpost students to the appropriate University support services.

Students are able to access a range of professional services including:

- Advice on practical aspects of study and how to use these opportunities to support and enhance their personal and academic development. This includes support for placements and careers guidance.
- Student Advice and Wellbeing Services provide students with advice, support and information, particularly in the areas of: student funding and financial matters, disability, advice and support to international students, study support, accommodation, health, wellbeing and counselling.
- Students studying for an LJMU award at a partner organisation will have access to local support services

Methods for evaluating and improving the quality and standards of teaching and learning

Student Feedback and Evaluation

The University uses the results of student feedback from internal and external student surveys (such as module evaluations, the NSS and PTES), module evaluation questionnaires and meetings with student representatives to improve the quality of programmes.

Staff development

The quality of teaching is assured through staff review and staff development in learning, teaching and assessment.

Internal Review

All programmes are reviewed annually and periodically, informed by a range of data and feedback, to ensure quality and standards of programmes and to make improvements to programmes.

External Examining

External examiners are appointed to programmes to assess whether:

- the University is maintaining the threshold academic standards set for awards in accordance with the FHEQ and applicable subject benchmark statements
- the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with University policies and regulations
- the academic standards are comparable with those in other UK higher education institutions of which external examiners have experience
- the achievement of students are comparable with those in other UK higher education institutions of which the external examiners have experience

and to provide informative comment and recommendations on:

- good practice and innovation relating to learning, teaching and assessment observed by external examiners
- opportunities to enhance the quality of the learning opportunities provided to students

Please note:

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content, teaching, learning and assessment methods of each module can be found in module and programme guides.