PROGRAMME SPECIFICATION

Bachelor of Engineering Honours (SW) in Construction Engineering

Awarding institution: Liverpool John Moores University
Teaching institution: LJMU
UCAS Code: F117
JACS Code: K220
Programme Duration: Full-Time: 3 Years, Sandwich Thick: 4 Years
Language of Programme: All LJMU programmes are delivered and assessed in English
Subject benchmark statement: Engineering (2015)
Programme accredited by:
Description of accreditation:
Validated target and alternative exit awards:
  - Bachelor of Engineering with Honours in Construction Engineering
  - Bachelor of Engineering Honours (SW) in Construction Engineering
  - Diploma of Higher Education in Construction Engineering
  - Diploma in Higher Education (SW) in Construction Engineering
  - Certificate of Higher Education in Construction Engineering

Programme Leader: Fiona Borthwick

Educational aims of the programme

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 construction 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 construction engineering.

Develop the students’ ability to apply engineering concepts and tools to the solution of construction 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 construction 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 opportunity of 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.

Alternative Exit/Interim Award Learning Outcomes - Certificate of Higher Education

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

- Demonstrate a sound knowledge of the underlying concepts and principles of construction engineering related subjects and have learned how to take different approaches to solving engineering problems.
- Demonstrate an ability to present, evaluate and interpret qualitative and quantitative data, in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts in construction engineering.

Alternative Exit/Interim Award Learning Outcomes - Diploma in Higher Education (SW)

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

- Apply the analytical and evaluation skills attained to a deeper knowledge of the principles and concepts of construction engineering and related subjects. Students will also be able to apply these principles widely within the context of the construction profession.
- Critically evaluate the appropriateness of different approaches to design and problem solving with construction engineering.
- A student who successfully completes a placement year will be eligible for the Sandwich award and will, in addition, to the above, be able to demonstrate the professional and personal skills necessary for effective employment within a professional environment.

Alternative Exit/Interim Award Learning Outcomes - Diploma of Higher Education

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

- Apply the analytical and evaluation skills attained to a deeper knowledge of the principles and concepts of construction engineering and related subjects. Students will also be able to apply these principles widely within the context of the construction profession.
- Critically evaluate the appropriateness of different approaches to design and problem solving with construction engineering.

Target award Learning Outcomes - Bachelor of Engineering Honours (SW)

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 construction engineering, and its underpinning science and mathematics.
2. Demonstrate knowledge and understanding of the implications the construction process can have on its surroundings considering aspects of health and safety, the environment and the public.
3. Demonstrate their knowledge and understanding of historical, current and future developments and technologies within construction engineering.
4. Demonstrate their knowledge and understanding of the project management function considering planning, control, risk and management systems.
5. Apply a range of mathematical and statistical methods in the solution of construction engineering problems and demonstrate an understanding of their limitations.
6. Demonstrate an understanding of concepts from a range of areas including some outside engineering, and the ability to apply them effectively in construction engineering projects.
7. Demonstrate an understanding of relevant codes of practice and the regulatory framework.
8. Demonstrate an understanding of construction materials.
9. Demonstrate their understanding of the international nature of construction engineering and apply this to the
design and evaluation of construction engineering projects.

10. Demonstrate an understanding of digital engineering technologies and their application.

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 of 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. Apply practical engineering skills acquired through, for example, work carried out in laboratories, to the design of construction engineering projects.

20. Work effectively within a group to design, analyse and evaluate construction engineering projects.

21. Apply an extensive knowledge and understanding of a wide range of engineering materials and components to construction engineering design.

22. Demonstrate a wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations.

23. Evaluate the sustainability of a construction project, and design effectively within the constraints of the ‘triple bottom line’ (social, environmental and economic).

24. Use appropriate techniques and equipment for undertaking practical field survey work.

25. Manage the design process and evaluate outcomes.

26. Use construction project management IT tools in an industry context.

27. Demonstrate an understanding of the need for a high level of professional and ethical conduct in construction engineering and a knowledge of professional codes of conduct.

28. Apply construction project management and planning skills within industrial contexts within the UK and the global market.

29. Apply skills in problem solving, communication, and working with others, as well as the effective use of general IT facilities and information retrieval skills.

30. Use technical literature and other information sources effectively.

31. Exercise initiative and ethical personal responsibility both as a leader and as a team member.

32. Work with limited or contradictory information.

33. Communicate effectively through the media of the written word, technical drawings, clear use of mathematical notation, orally and through the effective use of IT.

34. Apply a project management approach to the solution of relevant problems.

35. Plan and reflect on lifelong learning and development.

36. Appreciate entrepreneurship and creativity within a working environment.

**Alternative target awards**

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

Bachelor of Engineering with Honours in Construction Engineering -

A student successfully completing this award will have acquired the subject knowledge and understanding as well as skills and other attributes as detailed above but will not have successfully completed a placement year.

**Teaching, Learning and Assessment**
The methods used to enable outcomes to be achieved and demonstrated are as follows:

Lectures, tutorials, problem solving sessions, seminars, workshops, laboratory and computer sessions, off-site learning activities (including surveying fieldwork), participation in group projects. Case studies from industry practitioners, and the use of real examples from within construction engineering add to the student knowledge and understanding. The main vehicle for the skills development will be through the projects which involves verbal and visual presentations to a panel of experts, backed up by written reports.

Unseen examinations, open book examinations, assignments, preparation of reports, design tasks, oral presentations, visual presentations, workshops, peer review, computer-based exercises, work placement reports.

Lectures, tutorials, problem solving sessions, seminars, workshops, laboratory and computer sessions, off-site learning activities, participation in a group projects.

Unseen examinations, open-book examinations, assignments, preparation of reports, design tasks, oral presentations, visual presentations, workshops, peer review, computer-based exercises, work placement reports.

Lectures, tutorials, problem solving sessions, workshops, laboratory and computer sessions, off-site learning activities, participation in group projects and individual investigational/research project. The major vehicles for practical skills are laboratory work, field work including the surveying practical assessments, and the research project at level 6.

Unseen examinations, assignments, preparation of reports, design tasks, oral presentations, workshops, peer review, computer-based exercises, work placement reports. Assessment of field work and laboratory work also includes practical tests in situ.

Lectures, tutorials, problem solving sessions, seminars, workshops, laboratory and computer sessions, off-site learning activities, participation in a group project.

Unseen examinations, assignments, preparation of reports, design tasks, oral presentations, workshops, peer review, computer-based exercises, work placement reports.

**Programme structure - programme rules and modules**

The placement year, module 5200BESWCE, will follow Level 5 and students are 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 not undertaking a placement year will be 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 5200BESACE. 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 will offer the opportunity of 60 credits of study abroad at Level 5. Students will be enrolled on a 360 credit Honours with study abroad programme. A 60 credit Level 5 study abroad module (5300BESACE) 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 120 credits at Level 5.

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<thead>
<tr>
<th>Level 6</th>
<th>Potential Awards on completion</th>
<th>Bachelor of Engineering Honours (SW)</th>
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<tbody>
<tr>
<td>Core</td>
<td>Option</td>
<td>Award Requirements</td>
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<tr>
<td>6220BEUG CONSTRUCTION SITE MANAGEMENT (20 credits)</td>
<td>120 core credits at level 6</td>
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<tr>
<td>6250BEUG DIGITAL ENGINEERING DESIGN PROJECT (20 credits)</td>
<td>0 option credits at level 6</td>
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<tr>
<td>6251BEUG INFRASTRUCTURE ENGINEERING AND MANAGEMENT (20 credits)</td>
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<tr>
<td>6252BEUG ADVANCED STRUCTURES AND MATERIALS (20 credits)</td>
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<tr>
<td>6253BEUG PROFESSIONAL PRACTICE (10 credits)</td>
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<tr>
<td>6254BEUG CONSTRUCTION ENGINEERING RESEARCH PROJECT (30 credits)</td>
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<tr>
<td>Level 5</td>
<td>Potential Awards on completion</td>
<td>Award Requirements</td>
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<tr>
<td><strong>Core</strong></td>
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<td>5203BEUG RESEARCH METHODS (10 credits)</td>
<td>120 core credits at level 5</td>
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<td>5204BEUG COLLABORATIVE INTERDISCIPLINARY PROJECT 2 (10 credits)</td>
<td>0 option credits at level 5</td>
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<td>5219BEUG GEOMATICS (20 credits)</td>
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<td>5220BEUG SITE PRODUCTION MANAGEMENT (20 credits)</td>
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<td>5250BEUG GEOTECHNICS AND FOUNDATION ENGINEERING (20 credits)</td>
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<tr>
<td>5251BEUG STRUCTURAL DESIGN AND DETAILING (20 credits)</td>
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<tr>
<td>5252BEUG CONSTRUCTION ENGINEERING TECHNOLOGY 2 (20 credits)</td>
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<tr>
<td><strong>Option</strong></td>
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<td><strong>Award Requirements</strong></td>
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<th>Level 4</th>
<th>Potential Awards on completion</th>
<th>Award Requirements</th>
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<tr>
<td><strong>Core</strong></td>
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<tr>
<td>4200BEUG CONSTRUCTION TECHNOLOGY 1 (20 credits)</td>
<td>120 core credits at level 4</td>
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<tr>
<td>4201BEUG COLLABORATIVE INTERDISCIPLINARY PROJECT 1 (10 credits)</td>
<td>0 option credits at level 4</td>
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<tr>
<td>4205BEUG ACADEMIC AND DIGITAL LITERACY (10 credits)</td>
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<tr>
<td>4230BEUG CONSTRUCTION ENGINEERING PRACTICE (20 credits)</td>
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<tr>
<td>4231BEUG STRUCTURES AND MATERIALS (20 credits)</td>
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<td>4232BEUG APPLIED MATHEMATICS FOR CONSTRUCTION (20 credits)</td>
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<tr>
<td>4233BEUG ENVIRONMENTAL PRACTICE (20 credits)</td>
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<td><strong>Option</strong></td>
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<td><strong>Award Requirements</strong></td>
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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

**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 level 4 and 5 of the course students participate in cross disciplinary project modules and a major design project in the final year, mentored by industry, develops this further.

The full-time course is offered in Sandwich mode so that after two years of study, students may elect to work in industry 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
112 UCAS points: Minimum Two A2 levels (incl. 1 in a Maths, Physics or Chemistry subject)

BTEC National Diploma
Level 4: 112 UCAS points

AVCE
112 UCAS points: minimum two A2 levels (incl. Maths, Physics and Chemistry)

**Irish Leaving Certificate**
Level 4: 112 UCAS points; minimum 3 subjects at Higher level

**Scottish Higher**
Level 4: 112 UCAS points; minimum 2 subjects at Advanced Higher level

**International Baccalaureate**
Level 4: 112 UCAS points including maths and science at an appropriate level.

**Access**
Level 4: 112 UCAS points

**Higher national diploma**
HNC/HND (Non-cognate) Level 4 Entry: Pass
HNC/HND (Cognate) Level 5 Entry: Pass

**Other**
Foundation Degree (Cognate)
Level 5 entry: 240 credits, mean award mark of 40% or more.
Foundation Degree (Non-cognate)
Level 4 entry: 240 credits, mean award mark of 40% or more.

**Mature entry**
Applicants will normally be expected to hold one of the above qualifications. In exceptional circumstances, candidates with non-standard qualifications, may qualify for entry to the course on the basis of considerable experience deemed appropriate by the Faculty which would be subject to scrutiny under the RPEL regulations.

**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.