



Course Specification

MSc Structural Engineering

Course code: EECT012

**Faculty of Engineering, Environment and Computing
School of Energy, Construction and Environment**

Academic Year 2021/22

Please note: This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

We regularly review our course content, to make it relevant and current for the benefit of our students. For these reasons, course modules may be updated.

More detailed information on the learning outcomes, content, and teaching, learning and assessment methods of each module can be found in the Module Information Directory (MID), student module guide(s) and the course handbook.

The accuracy of the information contained in this document is reviewed by the University and may be verified by the Quality Assurance Agency for Higher Education.

Coventry University's accreditation with CMI is currently ongoing for the relevant modules and is regularly reviewed and monitored by the CMI through their quality systems. Whilst Coventry University anticipates that these reviews will continue to be successful, if they were to be unsuccessful, the relevant module in this course would no longer be accredited and we would notify applicants and students of this change as soon as possible.

PART A Course Specification (Published Document)

MSc Structural Engineering

1. Introduction

The world population is estimated by the United Nations to be about 9 billion by 2050. Global construction market is expected to benefit significantly over the forecast period owing to rising demand for both residential and non-residential infrastructure that require mostly expert structural engineers with a complete skill set; including the ability to design, monitor, manage and maintain heavy civil engineering structures operating under extreme loading and ever-changing environmental conditions. This therefore forms the basis for training and retraining more structural engineers in order to meet the present and the future demands.

The MSc Structural Engineering course is a specialist further technical learning aimed at holders of overseas bachelor's degree or UK bachelor's degree accredited as part of the educational base for a Chartered Engineer (e.g. BEng.) or an Incorporated Engineer (IEng) e.g. BSc. in civil engineering or cognate science/engineering disciplines seeking professional qualification as Chartered Engineers and specialty in structural engineering. The specialist course offered at Coventry University is designed to provide postgraduate analytical and professional skills across planning, analysing, designing and operational areas of timber, steel, concrete, sustainable composite and lightweight materials and structures. In addition, the course will provide students with an advanced numerical understanding and innovative mechanics involved and required for safe static and dynamic behaviour of structures during service using state-of-the-art software, including practical performance measurement and assessment of structures. Technical focused MSc research project is mandatory for students enrolled on this course.

The course is designed as a block learning system, consisting of 5 days of tuition spanning over two weeks (Monday to Wednesday in the first week, and Thursday & Friday in the second week), followed by independent study and completion of assessments. The course will provide topical and industry-focused postgraduate education to enhance career opportunities in structural and infrastructure engineering.

For students in today's competitive employment markets having work experience can significantly enhance employment prospects. For this reason, the course offers students the opportunity to undertake a work placement, extending the main provision to a two-year course. The work placement could be International or UK with a focus which may be industry or research. Following a selection process within the first semester and subject to securing an approved placement opportunity, students would move onto the two-year course. International students who are interested in a work placement will be supported in completing an application for extending their Student visa by international student support services. Upon completion of their placement, students will return to complete the course and the final project for the full award.

The high population of international participants mingled with home students and the ability for such students with diverse backgrounds and cultures to integrate while developing and reaching their full potential remain a cardinal feature of the educational provision. Other distinctive and innovative features include:

- Course accreditation at Chartered level by the Joint Board of Moderators (JBM) on behalf of the Engineering Council (EC-UK).
- The positive interaction between students and staff through academic tutorials and seminars.
- Extensive field & laboratory-based activities, computer-based simulations and guest speakers from industry which support students in putting theory into practice.
- An ample number of part-time students who study with the full-time students.
- International field activities to enhance global experience

In addition, postgraduate structural engineering places emphasis on engineering practice and its role within construction. Coventry University has a long-established reputation for the teaching of structural engineering and has excellent links with employers like Arcadis, Arup, Atkins, Balfour Beatty, BAM, Buro Happold, CGL, CPUK, Donaldson Associates, Galliford Try, Geotechnics Ltd, Interserve, Kier, Laing O'Rourke, Morgan Sindall, Mott MacDonald, Warwickshire County Council and Willmott Dixon, many of whom provide direct input into course development as members of our civil engineering advisory board. Graduates from the course will be well-suited to working in a range of structural and infrastructure engineering and management consultancies, contractors or client organisations.

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are interested in a work placement will be supported in completing an application for extending their Tier 4 visa by international student support services. Upon completion of their placement, students will return to complete the course and the final project for the full award.

As part of this course you will undertake a professional development module which is currently accredited by the Chartered Management Institute (CMI) for the 2020-21 intake. Upon successful completion of the module, you will gain the CMI Level 7 Certificate in Strategic Management and Leadership Practice at no additional cost.

2 Available Award(s) and Modes of Study

Title of Award	Mode of attendance	UCAS Code	FHEQ Level
MSc Structural Engineering	FT 1 year; 2 years with Work Placement PT normally 2 years	N/A	Level 7
Fall-back Awards Postgraduate Diploma in Structural Engineering Postgraduate Certificate in Structural Engineering			
3 Awarding Institution/Body	Coventry University		
4 Collaboration	N/A		
5 Teaching Institution and Location of delivery	Coventry University		
6 Internal Approval/Review Dates	Date of latest review: March 2018 Date for next review: (Academic year 2027/2028)		
7 Course Accredited by	The course specification is accredited by Joint Board of Moderators (JBM) up to the intakes 2021-22.		
8 Accreditation Date and Duration	To be confirmed.		
9 QAA Subject Benchmark Statement(s) and/or other external factors	<p>This course has been developed using the QAA's Framework for Higher Education Qualifications and the Masters subject benchmark statement for engineering.</p> <p>Both the MSc Civil Engineering (including Technical Route) and MSc Civil and Structural Engineering must satisfy the requirements for accreditation of the following Professional Bodies: The Institution of Civil Engineers (ICE). Institution of Structural Engineers (IStructE). The Chartered Institution of Highways and Transportation (CIHT). The Institute of Highway Engineers (IHE).</p>		
10 Date of Course Specification	Jan 2021		
11 Course Director	Dr Adegoke Olubanwo		

12 Outline and Educational Aims of the Course

The course is designed to equip graduates and professionals to develop high-level analytical/numerical knowledge, wide-ranging understanding of innovative mechanics and professional skills in structural engineering practice, with a complete skill set necessary to plan, analyse, design, assess, manage, and maintain civil engineering structures operating under normal and extreme loadings and dynamic range of environmental conditions. The overall aim, in line with the University's mission statement is to:

- ensure Coventry University maintains its established position in offering high quality educational provision in structural engineering planning, analysis, design, construction and management;
- provide an educational experience that meets students' and employers' needs and expectations;
- provide an up-to-date curriculum that articulates the current challenges and good practice in structural engineering;
- make use of the state-of-the-art computational and simulation tools to promote activity-based learning through solving real-life engineering problems;
- develop an in-depth understanding of the social, technological, legal and environmental influences on sustainable structural engineering practice;
- support students' capacity to evaluate, review and improve approaches and systems and apply learning effectively at an appropriate level using relevant methodologies, ensuring continuous improvement;
- prepare students for future challenges;
- develop personal, technical and management skills to enable graduates to contribute with a high level of competence in a global context;
- develop abilities in rigorous and valid independent technical investigation and research.

13 Course Learning Outcomes

On successful completion of the course students should be able to:

1. Apply knowledge and wide-ranging understanding of health, safety & environment principles and legal framework within which the construction industry operates, and undertake full ethical and professional responsibilities in the discharge of their duties;
2. Apply in-depth knowledge and detailed understanding of structural analysis and design, innovative construction and performance assessment and maintenance techniques to civil engineering structures;
3. Apply innovative and advanced computational methods and simulation tools to model and analyse complex structural and coupled-field engineering systems;
4. Apply wide-ranging understanding of experimental, analytical & numerical techniques for investigative studies in structural and geotechnical engineering;
5. Apply detailed understanding in proposal development and writing; use innovative knowledge in sourcing, analysing and presenting data; and apply research methodologies to undertake independent technical investigation and academic writing of a specialised topic;
6. develop personal abilities in teamwork, leadership and communication;
7. apply corporate strategy and systems theory to the management of projects in engineering and construction industry.
8. Critically evaluate the principles for leading and developing people and equality, diversity and inclusion at a strategic level.

14 Course Structure and Requirements, Levels, Modules, Credits and Awards

14.1 Course Structure

All modules within the course, their status and credit value are identified in Table 1 below. The MSc in Structural Engineering conforms to the University's regulations for lab-based taught post graduate degree courses. Within the parameters set by these regulations, the course has been designed to equip graduates with the core knowledge, skills and expertise within the field of Structural Engineering.

The Structural Engineering course may be studied via the following modes of attendance: full-time and part-time. Part time students study alongside full time. Each module consists of 5 days of tuition spanning over two weeks (Monday to Wednesday in the first week, and Thursday & Friday in the second week), followed by independent study and completion of assessments. Part-time participants study alternate modules requiring, in total, seven weeks of formal class attendance over a period of two academic years. (Part-time participants who wish to extend

their study over a longer period may do so subject to University regulations). Following the two weeks of tuition, part-time participants will have a period of at least five weeks for study and assessment.

Table 1: Module structure

Module Code	Module Title	Credits Value	Semester*	Course Learning Outcomes
7023EXQ	Connection Design	15	1	2,3,4,6
7024EXQ	Soil-Structure Interaction	15	2	3,4
7027EXQ	Applied Finite Element Analysis	15	1	2,3,4,6
7166EXQ	Integrated Project	15	1,2,3 (depending on cohort)	1,2,3,4,5,6,7
7032EXQ	Technical Research Project	50	1,2,3 (depending on cohort)	1,2,3,4,5,6
7033EXQ	Structural Dynamics & Earthquake Engineering	15	2	2,3,4
7034EXQ	Plastic Theory of Structures	15	2	2,3,4
7035EXQ	Prestressed & Composite Structures	15	2	2,3,4
7036EXQ	Structural Health & Performance Assessment	15	1	2,3,4
7084EXQ	Supporting to Transition to Postgraduate Study	0**	1,2,3 (depending on cohort)	4,6,7
7074EXQ	Preparing to Research	0**	1,2,3 (depending on cohort)	1,5
7049CRB	Leading Diverse Workforces	10	1,2,3 (depending on cohort)	8

Students will study eight mandatory modules and undertake one mandatory research project and one mandatory integrated (group) project.

** Credit bearing modules are supplemented by two zero credit modules which act as support for the technical content and for academic and professional skills. These may not be resat or repeated. Failure will not stop progression/completion or affect degree classification, but it will be listed on the degree transcript.

Students who successfully complete the module and meet the CMI learning outcomes will gain a Level 7 Certificate in Strategic Management and Leadership Practice based on the following CMI units: Leading and developing people to optimise performance (unit 702); Strategic approaches to diversity and Inclusion (unit 715).

Students who successfully complete this module will be awarded Foundation Chartered Manager status and be able to use the designation 'fCMgr' after their name.

Work placement

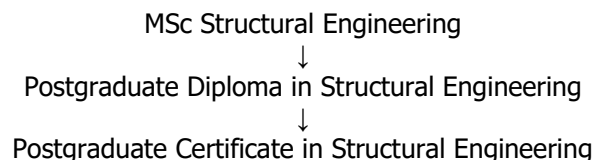
During semester 1, students who have expressed an interest in undertaking a work placement should begin the application process for placement opportunities. Students have the responsibility for securing a placement, but they will be supported throughout the application process by a specialist employer engagement team. The university will work with employers to identify opportunities. Subject to securing a placement, the International Student Support team will work with international students to obtain UK study visa extensions. Visas required to work in other countries will be the responsibility of the student.

The course is structured so that students complete two semesters of taught modules and then spend three semesters on placement. During this time students would be enrolled onto modules 7102CEM Extended Masters Work Placement A, 7103CEM Extended Masters Work Placement B and 7104CEM Extended Masters Work Placement C. The modules are zero credit and do not contribute to the classification or name of the award but must be passed to complete the placement. Upon completion of the work placement, students are expected to return to Coventry to complete the final semester during which time they undertake their project module. Successful completion of the Work Placement is reflected in the final student transcript.

Credit level	Module Code	Title	Credit Value	Mandatory/ Optional	Course Learning Outcomes
Subject to securing an appropriate placement opportunity and fulfilling the selection requirements, students will be transferred to the two-year course and the Work Placement modules listed below are to be taken.					
7	7102CEM	Extended Masters Work Placement A	0	Optional	
7	7103CEM	Extended Masters Work Placement B	0	Optional	
7	7104CEM	Extended Masters Work Placement C	0	Optional	

The work placement is to be taken over three semesters and prior to the final semester of the course.

Cascade of Awards:



Conditions for the award of an honours degree

The award of an MSc degree from this course requires students to pass all 180 credits.

Conditions for fall back award

The award of a PG Diploma in Structural Engineering from this course requires students to pass any 120 credits.

The award of a PG Certificate in Structural Engineering from this course requires students to pass any 60 credits

15 Criteria for Admission and Selection Procedure

Normally, the entrance requirement is a 2.2 honours degree in Civil Engineering or cognate science/engineering disciplines. Applicants with an overseas bachelor's degree or a UK bachelor's degree accredited as the educational base for a Chartered Engineer (e.g. BEng.) or an Incorporated Engineer (BSc.) in civil engineering or cognate science/engineering disciplines may apply. The course provides a recommended chartered pathway for both UK and overseas graduates seeking professional qualification as Chartered Engineers.

Applicants are normally invited to visit the University as part of the postgraduate open days in the Faculty of Engineering, Environment and Computing. This offers an opportunity for either party to evaluate each other and to ask questions. It also offers the applicant an opportunity to view the facilities on offer at the University.

Applications from those not possessing the equivalent of an honours degree will be considered on individual merit and decisions will be based on careful evaluation of the capacity of the applicant to complete the course successfully. Applicants whose first language is not English or who have not completed a first degree in which English was the main language of tuition must provide evidence of English language ability. An IELTS score of 6.5 or higher (and at least 5.5 in each component) or equivalent qualification is the criterion for admission.

Recognition for prior learning and experience is in accordance with the University regulations for taught postgraduate courses. This recognition will only be granted for achievements equivalent to master's level. Module exemptions can be given where a student demonstrates that their knowledge and skills achieved through previous study or experience meet all intended learning outcomes of a module. However appropriate alternative modules may be substituted, subject to the approval of the Programme Manager, who must ensure that the aim and learning outcomes of the

named award are achieved by any variations in the programme of study. Evidence may include some or all of the following as required:

- Transcript from previous level 7 study stating ILOs and mark
- 2 page analysis of professional experience and knowledge against module ILOs
- CPD non-assessed course (content detailed)

In calculations for an award these modules will be handled in accordance with University Academic Regulations for Taught Postgraduate Courses.

16 Academic Regulations and Regulations of Assessment

This Course conforms to the standard [University Regulations](#) Mode R

The programme is managed by the School of Energy, Construction and Environment Board of Study of the Faculty of Engineering, Environment and Computing.

The Programme Assessment Board (PAB) for the Faculty of Engineering, Environment and Computing is responsible for considering the progress of all students and making awards in accordance with both the university and course-specific regulations.

The assurance of the quality of modules is the responsibility of the Boards of Study which contribute modules to the programme.

External Examiners report annually on the programme and their views are considered as part of the Course Quality Enhancement Monitoring report (CQEM). Details of the CQEM process can be found on the Registry's web site. <https://share.coventry.ac.uk/staff/ps/Registry/qeu/Pages/Process%20%20Landing.aspx>

Students are represented on the Student Forum, Boards of Study and Faculty Board, all of which normally meet two or three times per year.

Student views are also sought through module and course evaluation questionnaires.

17 Indicators of Quality Enhancement

The following are key indicators of quality and standards:

1. The course has been designed in accordance with the QAA Subject Benchmark Statement for Engineering, UK-Spec of Engineering Council and the guidance of Joint Board of Moderators representing the Institution of Civil Engineers, Institution of Structural Engineers, Chartered Institute of Highways Engineers and Institute of Highways and Transportation.
2. The School has a strong portfolio of industry-related research, particularly in the areas of low carbon building technology and sustainable construction materials, and engineering education. In Civil & Engineering, MSc and PhD student projects supported by industry are available – to name a few: “Increasing the early age strength of High Volume Fly Ash (HVFA) concrete” by the UK Quality Ash Association, “GEM-Tech novel cementitious material” by Aer-Tech Developments Ltd. and “Innovative High Temperature Pipe connections” by Tata Steel.
3. The QAA’s Higher Education Review undertaken in February 2015 confirmed that Coventry University meets the UK expectations regarding the:
 - a. setting and maintenance of the academic standards of awards;
 - b. quality of student learning opportunities;
 - c. quality of the information about learning opportunities;
 - d. enhancement of student learning opportunities
4. All staff who teach on the course are active in scholarship/research and have a range of professional experience in civil and structural engineering and construction practice. 34% of the staff are Chartered Structural Engineers or equivalent status in their profession. The rest have either a PhD in a relevant subject or years of teaching experience in higher education.
5. The School has excellent links with local employers through our Civil Engineering Industry Advisory Board. These local employers provide input to course management, delivery and development.
6. Alumni have gained graduate employment in a wide variety of private and public firms around the world.

18 Additional Information

Enrolled students have access to additional, key sources of information about the course and student support including:

- Student Handbook
- Course Handbook
- Module Guides
- Aula Course & Module Webs
- Module Information Directory <https://webapp.coventry.ac.uk/MidWebNext/Main.aspx>
- EEC Student Portal
<https://share.coventry.ac.uk/students/EC/Pages/Home.aspx>
- Coventry University Student Portal
<https://share.coventry.ac.uk/students/Pages/Index.aspx>