

## Programme Specification for Postgraduate Programme Leading to: MSc Structural Engineering

Applicable for all postgraduate students starting in [2021-22]

Version No.	Date	Notes – QUALITY ASSURANCE USE ONLY	QA
2021-22 v1	July 2021	Programme specification document updated for postgraduate entrants in 2021.	JP
2021-22 v2	26 July 2021	Programme specification updated to show that the duration of a January start is 14 months rather than 12 months.	JP

Postgraduate Taught Programme	
1. Awarding institution	Brunel University London
2. Teaching institution(s)	Brunel University London
3. Home College/Department/Division	College of Engineering, Design and Physical Sciences / Dept Civil and Environmental Engineering.
4. Contributing College/Department/Division/ Associated Institution	None
5. Programme accredited by	Joint Board of Moderators, for Institution of Civil Engineers, Institution of Structural Engineers, Chartered Institution of Highways and Transportation and Institute of Highways Incorporated Engineers.
6. Final award(s) and FHEQ Level of Award	Master of Science in Structural Engineering (FHEQ level 7)
7. Programme title	MSc Structural Engineering
8. Programme type (single honours/joint)	N/A
9. Normal length of programme (in months) for each mode of study	September Starters – 12 months January Starters – 14 months
10. Maximum period of registration for each mode of study	Normal or standard duration plus 2 years up to a maximum of 5 years.
11. Variation(s) to September start	January from 2022 (of length stated in row 9 above)
12. Modes of study	Full -Time
13. Modes of delivery	Standard
14. Intermediate awards and titles and FHEQ Level of Award	Postgraduate Certificate in Structural Engineering (FHEQ level 7) Postgraduate Diploma in Structural Engineering (FHEQ level 7)
15. UCAS Code	N/A
16. HECoS Code	100148 (30%), 100153 (70%)
17. Route Code	H210PSTRUCEN
18. Relevant subject benchmark statements and other external and internal reference points used to inform programme design	<a href="#">UK Quality Code for Higher Education</a> <a href="#">QAA Subject Benchmark Statement (Engineering)</a> <a href="#">Brunel 2030</a> Brunel Placement Learning Policy, as published under the 'Placements' section of the ' <a href="#">Managing Higher Education Provision with Others</a> ' page.

19. Admission Requirements	Details of <a href="#">PGT entry requirements</a> are provided on the University's and College website. Levels of English for non-native speakers are outlined on Brunel International's <a href="#">language requirements</a> pages.
20. Other relevant information (e.g. study abroad, additional information on placements)	N/A
21. Programme regulations not specified in Senate Regulation 3. Any departure from regulations specified in Senate Regulation 3 must be stated here and approved by Senate.	N/A
22. Further information about the programme is available from the College website.	Link to programme information on the College website

### 23. EDUCATIONAL AIMS OF THE PROGRAMME

The primary aim of this programme is to create master's degree graduates with qualities and transferable skills for demanding employment in the construction and civil engineering sector. The graduates will have the independent learning ability required for continuing professional development and acquiring new skills at the highest level.

Specific aims are as follows:

- To provide education at postgraduate level in civil engineering, focussing on structural engineering with structures' safety and sustainability.
- To provide students with a solid technical basis of the current theories and practices in structural engineering with structures' safety and sustainability.
- To foster the critical acquisition and implementation of broad research and analytical skills related to structural engineering with structures' safety and sustainability.
- To provide advanced training in the design, analysis, assessment, evaluation and renovation of modern structures.
- To develop creative and professional working knowledge to enable graduates to follow successful civil engineering careers with national and international organisations.

To provide a pathway that will prepare graduates for successful careers including progression to Chartered Engineer status.

## 24. PROGRAMME AND INTERMEDIATE LEARNING OUTCOMES

The programme provides opportunities for students to develop and demonstrate knowledge and understanding (K) cognitive (thinking) skills (C) and other skills and attributes (S) in the following areas:

<b>Masters FHEQ Level 7</b>	<b>Category</b> (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)	<b>Learning Outcome</b>	<b>Masters Award Only</b>	<b>Associated Assessment Blocks Code(s)</b>	<b>Associated Study Blocks Code(s)</b>	<b>Associated Modular Blocks Code(s)</b>
<b>Masters and FHEQ level 7</b>						
	K	The principles and theories of structural design, analysis.				CE5601 CE5602 CE5606 CE5607
	K	The principles and theories of structural safety and sustainability.				CE5606 CE5607 CE5615 CE5519
	K	The basis for the recognition and understanding of the major features of structural engineering.				CE5606 CE5607 CE5603 CE5615 CE5519
	K	The basis for the recognition and understanding of the major features of structures' safety and sustainability.				CE5606 CE5607 CE5615 CE5519
	K	The research techniques including information retrieval, experimental design, theoretical derivation, and/or modelling				CE5615 CE5519 CE5513 CE5516
	K	The role of structural engineers in sustainable development of infrastructure engineering.				CE5606 CE5615 CE5519 CE5516
	C	Identify, analyse and solve engineering problems using a multidisciplinary approach, applying professional judgements to balance costs, buildability, safety and environmental impact and sustainability.				CE5602 CE5606 CE5607 CE5615 CE5519 CE5516
	C	Integrate and critically evaluate different design options.				CE5516 CE5606 CE5607 CE5603
	C	Plan and execute safely a series of experiments or computations.				CE5516 CE5601 CE5602 CE5606
	C	Use laboratory, field, and/or computational methods to conduct innovative structural design.				CE5516 CE5607 CE5603 CE5615

	C	Prepare technical reports, give technical presentations, and use the scientific literature for research and practical structural design effectively				CE5513 CE5516 CE5615
	S	Communicate effectively through oral and electronic presentations, written reports and effective networking.				CE5513 CE5516 CE5615 CE5519
	S	Select and employ appropriate advanced research methods.				CE5513 CE5516 CE5615
	S	Apply knowledge and modelling skills.				All taught modules
	S	Use information and communication technology.				CE5513 CE5516 CE5615
	S	Integrate and evaluate information from a variety of sources to define objectives and problems, solve problems, and make appropriate decision.				CE5516 CE5513 CE5615 CE5519
	S	Work independently with open-mindedness and critical thinking.				All taught modules
	S	Work as part of a team.				CE5615 CE5513
	S	Develop management and leadership skills.				CE5513 CE5516 CE5615

**Learning/teaching strategies and methods** to enable learning outcomes to be achieved, including formative assessments

Students will be introduced to subject material, including key concepts, information and approaches, through a mixture of standard lectures and seminars, self-study and individual research reports. A number of innovative strategies will also be adopted to enhance the learning and teaching of students. These include: actively using the university's Virtual Learning Environment (VLE) platform to facilitate teaching and learning, organising compulsory regular field trips and guest lectures. Our strong contact with industry and Industrial Advisory Board will be used to invite guest speakers from industry to present valuable insight into the real world of civil and structural engineering projects. All these strategies are designed to inspire students and challenge them to expand their own knowledge and understanding.

Preparation for work will be achieved through the development of the skills such as communication, planning, management and team work. Other ways to be employed to develop their work skills include engaging the students actively in their own personal development planning. One of the main innovative strategies is to develop students' skills for considering the structural safety and sustainability. Through the module of CE5513 Professional Development, students will be required to actively pursue their own personal development planning through continuously recording and keeping records of their own personal development throughout the course duration. Personal tutors will offer support to their tutees by regularly checking these records (termed, Personal Development Log (PDL)) and discussing any relevant issues.

Many of the practical activities in which the students engage develop into enjoyable experiences, for example working in teams and field work. A number of engineering societies are available in SED, for example, the Civil Engineering Society (CivSoc), Mechanical Engineering EQ8, etc. These are run by the students (with limited staff support) and form the focus for many extra-curricular, and fun, activities.

We encourage students to develop personal responsibility throughout the course. Many elements of coursework involve, and reward, the use of initiative and imagination. Students are guided into this through the use of an assessed Personal Development Plan, which is linked to one-to-one tutorials. This aids them in developing reflective skills.

**Summative assessment strategies and methods** to enable learning outcomes to be demonstrated.

Assessment will allow students to demonstrate their abilities in a range of styles relevant to the field of structural engineering. These will include:

- Formal examinations – to assess knowledge and understanding, ability to solve numerical and qualitative engineering problems and present a reasonable argument
- Essays – to develop skills in research (collecting, managing and interpreting evidence)
- Presentations and posters – ability to summarise and communicate orally and visually
- Laboratory reports – to develop skills in interpretation of experimental and theoretical findings and skills in communicating a systematic process and results
- Coursework – to develop transferable skills
- Group report – contribution as a team member to a collaborative challenge
- Personal Development Plan – develop ability to reflect on learning and planning development goals
- Individual dissertation – to develop advanced abilities in research and communication, further develop analytical skills, and assess knowledge and understanding

Assignment deadlines will be given to the students at the beginning of each academic year, allowing students to have a good planning and time management for their study.

## 25. Programme Structure, progression and award requirements

Programme structures and features: levels, assessment blocks, credit and progression and award requirements

- **Compulsory block:** one which all students registered for the award are required to take as part of their programme of study. These will be listed in the left hand column;
- **Optional block:** one which students choose from an 'option range'. These will be listed in the right hand column;
- A **core assessment** is an assessment identified within an assessment block or modular block (either compulsory or optional) which must be passed (at grade C- or better) in order to be eligible to progress and to be eligible for the final award. All core assessments must be specified on the programme specification next to the appropriate assessment or modular block:

Where students are expected to pass the block at C- or better, but not necessarily all elements, then the block itself is core.

e.g. AB5500 Project (40)

Core: Block

Where only some elements of assessments are required to be passed at C- or better, these will be identified by listing each element that is core

e.g. ABXXX1 Title (XX credits)

Core: 1 & 4

Where students are expected to pass all assessments in a block then this will be identified. By setting the assessment this way, students are also required to pass the block by default. This will be identified thus:

e.g. ABXXXX Title (XX credits)

Core: All, Block

- A **non-core assessment** does not have to be passed at grade C- or better, but must D- or better in order to be eligible for the final award.

## Full-Time Masters and FHEQ Level 7 – FOR FULL-TIME ROUTES ONLY

**Compulsory modular block codes, titles and credit**  
**All modules are 15 credits unless otherwise specified.**

### September Start

#### Autumn Term

(CE5601) Nonlinear Structural Analysis & Finite Element Method  
(CE5607) Advanced Reinforced and Prestressed Concrete Design  
(CE5603) Advanced Steel Design  
(CE5513) Research Methods and Professional Development  
(CE5516) MSc Civil Engineering Dissertation - 60 credits (Term 1 + 2)

#### Spring Term

(CE5602) Structural Dynamics & Seismic Design  
(CE5606) Advanced Construction Materials and Structural Retrofitting  
Technology  
(CE5615) Contemporary Structures and Sustainable Construction  
(CE5519) Infrastructure Management  
(CE5513) Research Methods and Professional Development  
(CE5516) MSc Civil Engineering Dissertation - 60 credits (Term 1 + 2)

### January Start

#### Spring Term

(CE5602) Structural Dynamics & Seismic Design  
(CE5606) Advanced Construction Materials and Structural Retrofitting  
Technology  
(CE5615) Contemporary Structures and Sustainable Construction  
(CE5519) Infrastructure Management  
(CE5513) Research Methods and Professional Development  
(CE5516) MSc Civil Engineering Dissertation - 60 credits (Term 1 + 2)

#### Autumn Term

(CE5601) Nonlinear Structural Analysis & Finite Element Method  
(CE5607) Advanced Reinforced and Prestressed Concrete Design  
(CE5603) Advanced Steel Design  
(CE5513) Research Methods and Professional Development  
(CE5516) MSc Civil Engineering Dissertation - 60 credits (Term 1 + 2)

## Masters and FHEQ Level 7 Progression and Award Requirements

### As per [Senate Regulation 3](#)

A PGDip may be awarded by substitution of the dissertation (CE5516) for up to 30 credits of modular/assessment blocks in the taught part of the programme, provided the learning outcomes have been met.

Please note: this specification provides a concise summary of the main features of the programme and the learning outcomes that a 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 and teaching, learning and assessment methods can be found in the modular block, assessment and study block outlines and other programme and block information. The accuracy of the information contained in this document is reviewed by the University from time to time and whenever a modification occurs.