

Programme Specification Leading to: BEng/MEng (Hons) Civil Engineering BEng/MEng (Hons) Civil Engineering with Placement

Applicable for all undergraduate students **starting at FHEQ Level 4 in 2020**

Version No.	Date	Notes – QUALITY ASSURANCE USE ONLY	QAM
2020.21 v1	25 August 2020	Programme updated for new entrants in September 2020.	JP
2020.21 v1.1	5 October 2020	Spec updates verified with Department.	JP

Undergraduate 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
4. Contributing College / Department	Department of Mathematics; Department of Mechanical and Aerospace Engineering, Department of Electronic and Electrical Engineering, Department of Chemical Engineering LBIC for Alternative Foundation Year (See section 25)
5. Programme accredited by	The Joint Board of Moderators (JBM), on behalf of Institution of Civil Engineers, Institution of Structural Engineers, Chartered Institution of Highways and Transportation, and The Institute of Highway Engineers
6. Final award(s) and FHEQ Level of Award	MEng (Hons) Civil Engineering (FHEQ level 7) MEng (Hons) Civil Engineering with Placement (FHEQ level 7)) BEng (Hons) Civil Engineering (FHEQ level 6) BEng (Hons) Civil Engineering with Placement (FHEQ level 6)
7. Programme title	BEng/MEng Civil Engineering
8. Programme type (Single honours/joint honours)	Single Honours
9. Normal length of programme for each mode of study	BEng - 36 months FT, 48 months sandwich MEng - 48 months FT, 60 months sandwich
10. Maximum period of registration for each mode of study	Normal or standard duration plus 3 years
11. Variation(s) to September start	None
12. Modes of study	Standard
13. Modes of delivery	Full Time and Thick Sandwich
14. Other/Intermediate awards and titles and FHEQ Level of Award	CertHE Civil Engineering (FHEQ level 4) DipHE Civil Engineering (FHEQ level 5)

	DipHE Civil Engineering with Placement (FHEQ level 5) BEng (Ord) Civil Engineering (FHEQ level 6) BEng (Ord) Civil Engineering with Placement (FHEQ level 6)
15. UCAS Code	MEng Civil Engineering (4 year FT) – H205 MEng Civil Engineering (5 year FSK – with placement) – H207 BEng Civil Engineering (3 year FT) – H204 BEng Civil Engineering (4 year FSK – with placement) – H206
16. JACS / HECoS Code	H810 (Civil Engineering) / 100148 Civil Engineering
17. Route Code	BEng H200UECIVENG MEng H200UMCIVENG
18. Relevant subject benchmark statements and other external and internal reference points used to inform programme design UK Spec	<p>UK Quality Code for Higher Education QAA Subject Benchmark Statement Brunel 2030 Brunel Placement Learning Policy, as published under the 'Placements' section of the Managing Higher Education Provision with Others page.</p> <p>Useful Pdf links:-</p> <p>the Engineering Benchmark Statement (http://www.qaa.ac.uk/en/Publications/Documents/Subject-benchmark-statement-Engineering-.pdf)</p> <p>the Framework for Higher Education Qualifications (http://www.qaa.ac.uk/en/Publications/Documents/qualifications-frameworks.pdf)</p> <p>Engineering Council: UK-Spec (https://www.engc.org.uk/ukspec)</p> <p>the JBM's guidance for accreditation, which includes programme design (https://www.jbm.org.uk/Accreditation-guidance)</p> <p>Brunel's Programme Approval Policy (http://www.brunel.ac.uk/about/quality-assurance/documents/pdf/Programme-Approval-Policy.pdf),</p>
19. Admission Requirements	For all current entry requirements, please click here . Levels of English for non-native speakers are outlined on the University's language requirements pages.

20. Other relevant information (e.g. study abroad, additional information on placements)	Optional work placement year is available after completion Level 5 BEng (thick sandwich mode), or after completion Level 6 MEng (thick sandwich mode) leading to the award of BEng/MEng Civil Engineering with Placement
21. Programme regulations not specified in Senate Regulation 2. Any departure from regulations specified in Senate Regulation 2 must be stated here and approved by Senate.	Where a student has failed the module CE5006 Group Project (45 credits) an exception to Senate Regulation 2 regarding the maximum amount of reassessment at FHEQ Level 7 is allowed. The student will be permitted up to 45 credits of reassessment which will be applied to module CE5006 Group Project only. In all other cases the maximum amount of reassessment remains at 40 credits. However, reassessment in the Group project as a 2nd attempt does not satisfy the requirements for an accredited degree.
22. Further information about the programme:	<p>Link to programme information on the College website</p> <p>Course webpage</p>

23. EDUCATIONAL AIMS OF THE PROGRAMME

The Civil Engineering programme at Brunel University London is part of the Brunel Engineering Curriculum portfolio. As such, its aim is to produce graduates that are creative, knowledgeable, have perspective and are professional in their approach.

The programme has been designed from the ground up in response to current industry needs and aims at equipping the students with a solid engineering background, combined with a variety of skills needed to excel in the workplace.

The programme is highly innovative with respect both to its content and its delivery strategy. The first two years will focus on providing the students with the necessary knowledge in fundamental disciplines (e.g. maths, structures, geotechnics, materials, fluid mechanics, engineering systems) and basic understanding of key topics at the basis of the profession (e.g. surveying, health and safety and professional skills). In the following two years, traditional topics (e.g. civil engineering design, construction management) are complemented by specialist ones such as structural analysis, innovative materials and structural dynamics which address pressing needs and opportunities in today's industry. Key pillars running throughout the programme are sustainability, system thinking, health and safety, risk management, problem solving and innovation. Specific focus is also on the practical aspects that form a well-rounded Engineer with the introduction of the novel Civil Engineer's Toolbox.

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 Engineering Analysis (EA), Design (D), Economic, legal, social, ethical and environmental context (EL), Engineering practice (P) and Additional transferable general skills (G). *Correlations with the Engineering Council's AHEP3 learning outcomes are given in the left-hand column.*

Level	Category (K = knowledge & understanding, C = cognitive (thinking) skills, S = other skills and attributes)	Learning Outcome	Associated Assessment Blocks Code(s)	Associated Study Blocks Code(s)	Associated Modular Blocks Code(s)
FHEQ Level 4					
SM1b SM1m	K	Knowledge, understanding, skills gathering and comprehension of the specific engineering disciplines relevant to engineering or Civil engineering, including systems, mechanics and materials.			BE1603 BE1604 BE1605 CE1620
EA1b EA1m	K/C	Knowledge of the fundamental scientific principles that underpin an education relevant to engineering and demonstrating their application (e.g. basic energy and mass balance and fundamentals of thermodynamics and fluid mechanics)			BE1601 BE1603 CE1620
EA1b EA1m	K/C	Knowledge and understanding of the fundamental mathematical and statistical principles that underpin basic calculations in engineering			BE1601
EL1	K/C	Apply a systems approach to identify the problems and apply core Civil engineering principles to their analysis			BE1602 CE1620
P1	C	Ability to formulate basic problems, apply and demonstrate mathematical methods together with computational tools (Matlab, Excel) in the analysis of engineering problems			BE1601 CE1620 BE1604 BE1605
D1	C	Ability to apply and demonstrate scientific principles to relevant engineering applications, collect, manipulate and interpret data (e.g. labs)			BE1602 CE1620

EA1b Ea1m	K/S	Knowledge and understanding in the use of computer tools in solving basic engineering problems (e.g. Matlab, Excel, etc.)			BE1601 BE1602 CE1620
P1	S	Basic knowledge of management, entrepreneurship and safety culture			BE1602 CE1620
G1	S	Effective communication of technical material, ethics demonstration, in the form of written reports and oral presentations			BE1602 BE1604 CE1620 BE1605
G1	S	Working effectively as a member of a team; managing time and resources to given constraints			BE1602 CE1620
FHEQ Level 5					
SM2b SM2m	K/C	Knowledge and understanding of mathematical and statistical methods necessary to underpin their education in their engineering discipline and to enable them to apply mathematical and statistical methods, tools and notations proficiently in the analysis and solution of engineering problems			CE2604 CE2003 CE2605
EA2	K/C	Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques			CE2606 CE2604 CE2608 CE2003 CE2607
D2	K/S	Investigate and define the problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards			CE2606 CE2604 CE2608 CE2605
EL3b EL3m	K/S/C	Knowledge and understanding of management techniques, including project and change management, that may be used to achieve engineering objectives, their limitations, and how they may be applied appropriately			CE2606 CE2604 CE2608

P2b P2m	K/S/C	Knowledge of characteristics of particular equipment, processes or products, with extensive knowledge and understanding of a wide range of engineering materials and components			CE2604 CE2608 CE2605
EL2	K/S	Knowledge and understanding of the commercial, economic and social context of engineering processes			CE2608
G2	K/S	Plan self-learning and improve performance, as the foundation for lifelong learning/CPD			CE2604
FHEQ Level 6					
SM3b	K/S/C	Ability to apply and integrate knowledge and understanding of the other engineering disciplines to support study of their own engineering discipline			CE3009 CE3612 CE3604
EA3b	S/C	Ability to apply quantitative and computational methods in order to solve engineering problems and to implement appropriate action			CE3009 CE3610 CE3612
EA4	K/S	Understanding of, and the ability to apply, an integrated or systems approach to solving engineering problems			CE3009 CE3610 CE3612
D3b	K/S/C	Assess and work with information that may be incomplete or uncertain and quantify the effect of this on the design			CE3009 CE3610
D4	K/S/C	Apply advanced problem-solving skills, technical knowledge and understanding, to establish rigorous and creative solutions that are fit for purpose for all aspects of the problem including production, operation, maintenance and disposal			CE3009 CE3610 CE3612 CE3604
D5	K/S	Plan and carry out a personal programme of work, adjusting where appropriate			CE3009 CE3610 CE3611
D6	K/C	Communicate their work to technical and non-technical audiences			CE3009 CE3610 CE3611
EL5b	K/S/C	Awareness of relevant legal requirements governing engineering activities, including personnel, health & safety and liability issues			CE3009 CE3611

EL6m & EL6b	K/S/C	Knowledge and understanding of risk issues, including health & safety, environmental and commercial risk, and of risk assessment and risk management techniques			CE3009 CE3611
P6	K/S/C	Understanding of appropriate codes of practice and industry standards			CE3009 CE3610 CE3604
P7	K/C	Awareness of quality issues and their application to continuous improvement			CE3009 CE3604
P8	K/C	Ability to plan and work with technical uncertainty			CE3009 CE3610 CE3604
P11b & P11m	K/S	Understanding of, and the ability to work in, different roles within an engineering team			CE3610
	K/C/S	Employ relevant Civil engineering principles to critically evaluate abstract concepts, to deliver credible conclusions through both independent and team work, using creative approaches on complex technical problems to an optimised design			CE3009 CE3610 CE3604 CE3612
	C/S	Ability to apply quantitative and computational methods in order to solve engineering problems and to implement appropriate action including detailed health and safety, environmental and economic considerations			CE3009 CE3611 CE3612
D2 & EL4	K/S/C	Apply advanced problem-solving skills, technical knowledge and understanding, to establish rigorous and creative solutions that are fit for purpose for all aspects of the problem including production, operation, maintenance and disposal			CE3009 CE3610

FHEQ Level 7					
SM4m	K/C	Critical awareness of developing technologies related to civil engineering			CE5006 CE5010 CE5011 CE5652
SM6m	K/C	Systematic understanding of concepts from a range of areas, including some outside engineering and the ability to evaluate and apply them in an engineering context			CE5006 CE5010 CE5011 CE5652
EA5m	C	Ability to use fundamental knowledge to critically investigate new and emerging technologies.			CE5006 CE5010 CE5011 CE5652
EA6M	C	Ability to extract and evaluate pertinent data and to apply engineering analysis techniques in the solution of unfamiliar problems			CE5006 CE5010 CE5011 CE5652
D7m	K/C	Demonstrate wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations			CE5006 CE5010 CE5011 CE5652
D8m	C	Demonstrate the ability to generate an innovative design for products, systems, components or processes to fulfil new needs			CE5006 CE5514
EL7m	K	Demonstrate critical awareness of the key drivers for business success, including innovation, judgement, calculated commercial risks and customer satisfaction			CE5006 CE5015 CE5514
P9m	K/C/S	A thorough and critical understanding of current practice and its limitations, and some appreciation of likely new developments.			CE5006 CE5015
P10m	k/C/S	Ability to critically apply engineering techniques taking account of a range of commercial and industrial constraints			CE5006 CE5514 CE5015
P11m	K/C/S	Critical understanding of different roles within an engineering team and the ability to exercise initiative and personal responsibility, which may be as a team member or leader.			CE5006 CE5514 CE5010

	K	Systemic approach, extensive knowledge and critical understanding of a wide range of cutting edge Civil engineering methodologies and practice			CE5006 CE5010 CE5514 CE5011 CE5652
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Learning/teaching strategies and methods to enable learning outcomes to be achieved, including formative assessments

Modern teaching methodologies and technologies will be used to ensure maximum engagement from the students. Flipped classrooms approach will be incorporated into teaching where appropriate to allow for interaction and deeper learning through application. Team based learning and group exercises will provide students with training in communication skills and the ability to work in teams as well as the ability to hold a debate and justify the choice of their design or solution to a set problem. Formative work, including tests and practice work will allow students to experiment with their learning and communication skills.

Practical sessions, including hands-on experiments, computer practicals and surveying will enable students to develop applied skills, and link theory to practice. Students will also take part in off-campus activities, including a residential field course at FHEQ Level 5.

The MEng group project is designed in such a way as to enable multidisciplinary teams including students from a range of engineering disciplines to work together on a shared, design-centred challenge.

Experienced engineers working in the Civil Engineering sector will deliver selected parts of the programme, ensuring students are exposed to the practicalities of the industry and understand more of the world of work. A group poster conference (part of BE1602) will take place towards the end of FHEQ L4, with a range of industrial specialists invited to examine the posters and talk with the students. Students will also have the opportunity to work on industry-related projects at FHEQ L6 and L7.

The opportunity to think creatively, including producing novel designs, will be given at all levels, particularly:

FHEQ L4: BE1602 Engineering Practice; CE1620 Introduction to Contemporary Civil Engineering
 FHEQ L5: CE2604 Civil Engineering Toolbox and Professional Skills; CE2606 Structural Design
 FHEQ L6: CE3099 Final Year Project; CE3610 Design of Structural Systems
 FHEQ L7: CE5006 Major Group Project; CE5010 Structural Design and FEA

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

The assessment strategy is developed in mind to cover all needs and abilities of students and to help them to achieve the programme learning outcomes, to make studying more interactive for the students and to help them to benefit from continued professional development. Some assessment will focus on knowledge and understanding. From FHEQ L4, there will also be open and 'authentic' assessments based on 'real world' type challenges to allow students to develop deeper understanding and creative judgement.

Students will be tested by a combination of exams and assignments (in the form of coursework, laboratory reports, in-class tests and presentations at all levels). This will allow the students to demonstrate the knowledge, skills and systems thinking they have acquired in each module and to better prepare them for the workplace.

Each learning outcome is covered by more than one assessment.

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 D- 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 D- or better, but not necessarily all elements, then the block itself is core.

e.g. AB3000 Project (40)

Core: Block

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

e.g. AB3001 Title (20 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. AB3002 Title (20 credits)

Core: All, Block

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

Foundation Year

The Foundation Year available to international students is specified in document "Validated Programme Element Specification for LBIC Alternative Foundation in Engineering". This document also specifies the admission and progression requirements.

Level 4

Compulsory assessment block codes, titles and credits	Optional assessment block codes, titles and credits
Compulsory study block codes, titles and credit volume	Optional Study block codes, titles and credit volume

Compulsory modular block codes, titles and credits BE1601 Engineering Mathematics & Programming (Core Block) – (20 credits) BE1602 Engineering Practice (Core Block) – (20 credits) BE1603 Engineering Systems and Energy – (30 credits) BE1604 Engineering Mechanics and Materials I – (15 credits) BE1605 Engineering Mechanics and Materials II – (15 credits) CE1620 Introduction to Contemporary Civil Engineering (20 credits)	Optional modular block codes, titles and credits
Level 4 Progression and Award Requirements As per Senate Regulation 2	

Level 5	
Compulsory assessment block codes, titles and credits	Optional assessment block codes, titles and credits
Compulsory study block codes, titles and credit volume	Optional Study block codes, titles and credit volume
Compulsory modular block codes, titles and credits CE 2604 Civil Engineering Toolbox and Professional Skills (20) CE 2605 Geotechnical Engineering (20) CE 2003 Structural Mechanics (20) CE 2606 Structural Design and Detailing (20) CE 2607 Hydraulics (20) CE 2608 Construction Material and Sustainability(20)	Optional modular block codes, titles and credits
Level 5 Progression and Award Requirements As per Senate Regulation 2	

Level 5 – Placement	
Compulsory assessment block codes, titles and credits	Optional assessment block codes, titles and credits
Compulsory study block codes, titles and credit volume	Optional study block codes, titles and credit volume
Compulsory modular block codes, titles and credits CE2555 Placement (120) Core: Block	Optional modular block codes, titles and credits

Level 5 Placement Progression and Award Requirements

As per [Senate Regulation 2](#)

For BEng Civil Engineering with Placement, CE2555 will contribute 25% of the FHEQ Level 5 profile and 8.3% of the overall degree calculation.

Module CE2555 must be undertaken between Levels 4 & 5.

For MEng Civil Engineering with Placement, (CE2555) will contribute 25% of the FHEQ Level 5 profile and 5% of the overall degree calculation.

Module CE2555 must be undertaken between Levels 5 & 6 or 6 & 7.

If registered on BEng Civil Engineering with Placement, and the placement module (CE2555) is not passed at D- or above, a DipHE Civil Engineering may be awarded by the Board of Examiners.

Level 6

Compulsory assessment block codes, titles and credits	Optional assessment block codes, titles and credits
Compulsory study block codes, titles and credit volume	Optional study block codes, titles and credit volume
Compulsory modular block codes, titles and credits CE 3009 Final Year Project (BEng students only) Core: Block (40) CE 3099 Final Year Project (MEng students only) Core: Block (40) CE 3610 Design of Structural Systems (20) CE 3611 Contract Management, Procurement and Risk (20) CE 3612 Structural Analysis and Computational Mechanics (20) CE 3604 Innovative Construction Materials (20)	Optional modular block codes, titles and credits

Level 6 Progression and Award Requirements

As per [Senate Regulation 2](#)

For BEng Civil Engineering with Placement, CE2555 will contribute 25% of the FHEQ Level 5 profile and 8.3% of the overall degree calculation.

Module CE2555 must be undertaken between Levels 4 & 5.

For MEng Civil Engineering with Placement, (CE2555) will contribute 25% of the FHEQ Level 5 profile and 5% of the overall degree calculation.

Module CE2555 must be undertaken between Levels 5 & 6 or 6 & 7.

If registered on BEng Civil Engineering with Placement, and the placement module (CE2555) is not passed at D- or above, the degree of BEng Civil Engineering may be awarded by the Board of Examiners.

Level 7	
<p>Compulsory modular block codes, titles and credits</p> <p>CE 5006 Major Group Project (45 credits), Core: Block The student's input to the major group project topic must be directly relevant to civil engineering</p> <p>CE5015 Project Management (15 credits) CE5010 Structural Design and FEA (15 credits) CE5012 Risk and Financial Management (15 credits) CE5011 Water Infrastructure Engineering (15 credits) CE5652 Structural Dynamics and Seismic Design (15 credits).</p>	<p>Optional modular block codes, titles and credits</p>
<p>Level 7 Progression and Award Requirements</p> <p>As per Appendix B of Senate Regulation 2</p> <p>MEng (Honours) Civil Engineering: 480 Credits MEng (Honours) Civil Engineering with Placement: 600 Credits</p> <p>For BEng Civil Engineering with Placement, CE2555 will contribute 25% of the FHEQ Level 5 profile and 8.3% of the overall degree calculation. Module CE2555 must be undertaken between Levels 5 & 6.</p> <p>For MEng Civil Engineering with Placement, CE2555 will contribute 25% of the FHEQ Level 5 and 5% of the overall degree calculation. Module CE2555 must be undertaken between FHEQ Levels 5 & 6 or 6 & 7.</p> <p>If registered on MEng Civil Engineering with Placement, and the placement module (CE2555) is not passed at D- or above, the degree of MEng Civil Engineering may be awarded by the Board of Examiners.</p>	

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.