

## Programme Specification Leading to:

MEng (Hons) Civil Engineering  
 MEng (Hons) Civil Engineering with Placement  
 BEng (Hons) Civil Engineering  
 BEng (Hons) Civil Engineering with Placement  
 MEng (Hons) Civil Engineering (Environmental Engineering)  
 MEng (Hons) Civil Engineering (Environmental Engineering) with Placement  
 BEng (Hons) Civil Engineering (Environmental Engineering)  
 BEng (Hons) Civil Engineering (Environmental Engineering) with Placement  
 MEng (Hons) Civil Engineering (Flood and Coastal Engineering)  
 MEng (Hons) Civil Engineering (Flood and Coastal Engineering) with Placement  
 BEng (Hons) Civil Engineering (Flood and Coastal Engineering)  
 BEng (Hons) Civil Engineering (Flood and Coastal Engineering) with Placement

*Applicable for all undergraduate students starting in September 2022*

<u>Version No.</u>	<u>Date</u>	<u>Notes – QUALITY ASSURANCE USE ONLY</u>	<u>QA</u>
2022-23 v1	12 April 2022	New programme and award approved by Senate on 6 April 2022. Programme to commence in September 2022.	SK
2022-23 v1.1	22/06/2022	BPC added as route onto programme via CEC Chair's Action	SK

Undergraduate Programme	
1. Awarding institution	Brunel University London (BUL)
2. Teaching institution(s)	Brunel University London (BUL)
3. Home College / Department / Division	College of Engineering, Design and Physical Sciences / Department of Civil and Environmental Engineering
4. Contributing College / Department	<p>Department of Mathematics; Department of Mechanical and Aerospace Engineering, Department of Electronic and Electrical Engineering, Department of Chemical Engineering</p> <p>Brunel University London Pathway College (BPC) offers the following Validated Programme Element/s which enable progression on to this programme:</p> <ul style="list-style-type: none"> <li>BPC Alternative Foundation in Engineering</li> </ul>
5. Programme accredited by	<p>The BEng/MEng Civil Engineering, BEng/MEng Civil Engineering (Environmental Engineering), and BEng/MEng Civil Engineering (Flood and Coastal Engineering) programmes will be submitted to the Joint Board of Moderators (JBM), on behalf of Institution of Civil Engineers, Institution of Structural Engineers, Chartered Institution of Highways and Transportation, Institute of Highway Engineers, and The Permanent Way Institution to perform conformity assessments.</p> <p>The BEng/MEng Civil Engineering (Flood and Coastal Engineering) and BEng/MEng Civil Engineering (Environmental Engineering) programmes will be submitted to the Chartered Institution of Water and Environmental Management (CIWEM) for conformity assessments.</p>
6. Final award(s) and FHEQ Level of Award	<p>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)</p>

	<p>MEng (Hons) Civil Engineering (Environmental Engineering) (FHEQ level 7)  MEng (Hons) Civil Engineering (Environmental Engineering) with Placement (FHEQ level 7))  BEng (Hons) Civil Engineering (Environmental Engineering) (FHEQ level 6)  BEng (Hons) Civil Engineering (Environmental Engineering) with Placement (FHEQ level 6)</p> <p>MEng (Hons) Civil Engineering (Flood and Coastal Engineering) (FHEQ level 7)  MEng (Hons) Civil Engineering (Flood and Coastal Engineering) with Placement (FHEQ level 7))  BEng (Hons) Civil Engineering (Flood and Coastal Engineering) (FHEQ level 6)  BEng (Hons) Civil Engineering (Flood and Coastal Engineering) with Placement (FHEQ level 6)</p>
7. Programme title	<p>BEng/MEng (Hons) Civil Engineering  BEng/MEng Civil Engineering (Environmental Engineering)  BEng/MEng Civil Engineering (Flood and Coastal Engineering)</p>
8. Programme type (Single honours/joint honours)	Single Honours
9. Normal length of programme for each mode of study	<p>BEng - 36 months FT, 48 months sandwich  MEng - 48 months FT, 60 months sandwich</p> <p>For students commencing their studies at BPC Alternative Foundation Element/s, the normal length will vary as follows:</p> <ul style="list-style-type: none"> <li>Foundation Year - September commencement: + 12 months</li> <li>Foundation Year - January commencement: + 9 months</li> </ul>
10. Maximum period of registration for each mode of study	Normal or standard duration plus 3 years
11. Variation(s) to September start	<p>None for Standard Levels.</p> <p>See "<a href="#">Validated Programme Element Specifications</a> BPC Alternative Foundation in Engineering" section 9 "Programme Intakes" for BPC Alternative Foundation Element/s.</p>
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	<p>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 (Environmental Engineering) (FHEQ level 6)  BEng (Ord) Civil Engineering (Flood &amp; Coastal Engineering) (FHEQ level 6)  BEng (Ord) Civil Engineering with Placement (FHEQ level 6)  BEng (Ord) Civil Engineering (Environmental Engineering) with Placement (FHEQ level 6)  BEng (Ord) Civil Engineering (Flood &amp; Coastal Engineering) with Placement (FHEQ level 6)</p> <p>BEng Engineering (Civil) (FHEQ level 6)  BEng Engineering (Civil) with Placement (FHEQ level 6)  BEng Engineering (Civil – Environmental Engineering) (FHEQ level 6)  BEng Engineering (Civil – Environmental Engineering) with Placement (FHEQ level 6)</p> <p>BEng Engineering (Civil – Flood and Coastal Engineering) (FHEQ level 6)  BEng Engineering (Civil – Flood and Coastal Engineering) with Placement (FHEQ level 6)</p> <p>MEng Engineering (Civil) (FHEQ level 7)</p>

	<p>MEng Engineering (Civil) with Placement (FHEQ level 7)</p> <p>MEng Engineering (Civil – Environmental Engineering) (FHEQ level 7)</p> <p>MEng Engineering (Civil – Environmental Engineering) with Placement (FHEQ level 7)</p> <p>MEng Engineering (Civil – Flood and Coastal Engineering) (FHEQ level 7)</p> <p>MEng Engineering (Civil – Flood and Coastal Engineering) with Placement (FHEQ level 7)</p>
15. UCAS Code	<p>BEng Civil Engineering H208/H209</p> <p>MEng Civil Engineering H2P0/H2P1</p> <p>BEng Civil Engineering (Environmental Engineering) H220/H221</p> <p>MEng Civil Engineering (Environmental Engineering) H222/H223</p> <p>BEng Civil Engineering (Flood and Coastal Engineering) H210/H211</p> <p>MEng Civil Engineering (Flood and Coastal Engineering) H212/H213</p>
16. HECoS Code	100148
17. Route Code	<p>BEng Civil Engineering 58FHUECIENG</p> <p>MEng Civil Engineering 58FHUMCIENG</p> <p>BEng Civil Engineering (Environmental Engineering) DJA2UECEENEN</p> <p>MEng Civil Engineering (Environmental Engineering) DJA2UMCEENEN</p> <p>BEng Civil Engineering (Flood and Coastal Engineering) 8CP6UECEFCFCE</p> <p>MEng Civil Engineering (Flood and Coastal Engineering) 8CP6UMCEFCFCE</p>
18. Relevant subject benchmark statements and other external and internal reference points used to inform programme design UK Spec	<p><a href="#">UK Quality Code for Higher Education</a>  <a href="#">QAA Subject Benchmark Statement - Engineering</a>  <a href="#">Brunel 2030</a>  The revised fourth edition of the Accreditation of Higher Education Programmes (or AHEP4) <a href="https://www.engc.org.uk/ahep">https://www.engc.org.uk/ahep</a></p> <p>Other useful information:</p> <p>The Framework for Higher Education Qualifications  <a href="https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf">https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf</a></p> <p>Engineering Council: UK-Spec (<a href="https://www.engc.org.uk/ukspec">https://www.engc.org.uk/ukspec</a>)</p> <p>JBM guidance for accreditation, which includes programme design  <a href="https://www.jbm.org.uk/Accreditation-guidance">https://www.jbm.org.uk/Accreditation-guidance</a></p> <p>Brunel University London Senate Regulation  <a href="https://www.brunel.ac.uk/about/documents/pdf/Senate-Regulation-2-from-2019-2020-03-04.pdf">https://www.brunel.ac.uk/about/documents/pdf/Senate-Regulation-2-from-2019-2020-03-04.pdf</a></p> <p>Brunel's Programme Approval Policy (<a href="https://staff.brunel.ac.uk/university-information/policy">https://staff.brunel.ac.uk/university-information/policy</a>)</p>
19. Admission Requirements	<p>For all current entry requirements, please click <a href="#">here</a>.</p> <p>Levels of English for non-native speakers are outlined on the University's <a href="#">language requirements</a> pages.</p>
20. Other relevant information (e.g. study abroad, additional information on placements)	<p>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</p>
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.	<p>For an accredited award (by JBM), students must meet the following requirements (<a href="https://www.engc.org.uk/ahep">https://www.engc.org.uk/ahep</a>):</p> <ul style="list-style-type: none"> <li>• All AHEP4 learning outcomes (e.g. 'C' learning outcomes for the BEng degree programme and 'M' learning outcomes for the MEng degree programme) must be achieved;</li> <li>• For an accredited award, students may not be allowed an aegrotat pass on any module or have more than 30 credits of allowed failure (E-, E or E+ at Levels 4 – 6; D-, D, D+ at level 7) throughout their entire profile. Major individual project (e.g. CE_31) and group-based project modules (e.g.</li> </ul>

	<p>CE_51) must not be compensated; No condonement of modules delivering AHEP4 learning outcomes is allowed.</p> <p>Variations to Senate Regulation 2:</p> <ul style="list-style-type: none"> <li>• Level 6 and 7 core project assessment blocks are each required to be of at least 40 credits in volume. Variation to this stipulation is that the programmes' Level 6 Major individual project (CE_31) and Level 7 Group project (CE_51) will each be 30 credits.</li> <li>• the maximum amount of reassessment blocks at Level 5, 6 and 7 is a total of 40 credits in volume. Variation to this is that the students will be permitted up to 45 credits of reassessment at each of these levels.</li> </ul>
22. Further information about the programme:	Link to programme information on the College website (TBC)

## 23. EDUCATIONAL AIMS OF THE PROGRAMME

The main aim of the BEng/MEng Civil Engineering programme and the two pathway programmes is to produce graduates who possess a sound knowledge and understanding of civil engineering subjects and their application in the modern world. Graduates from these Civil Engineering programmes will be capable of addressing the needs of society and business, including, being: able to deploy appropriate engineering methods and technologies; skilled in solving complex engineering challenges; competent to work with the environment in a sustainable manner; effective in mitigating climate change impacts on infrastructure and human society. These learning outcomes (LOs) will be achieved by a range of specialist taught modules in the programmes and also by drawing on the internationally-renowned research expertise at Brunel University London (BUL).

Year 1 will include the common set of modules, applicable to all of the University's Engineering disciplines. This largely common year will allow students to gain a solid grounding in core areas of engineering science, including; solid body mechanics, thermodynamics, materials science, and the fundamentals of design and manufacturing.

Year 2 modules will be identical for all the Civil Engineering programme pathways. The modules will focus on providing the students with essential civil engineering subject knowledge in: structural mechanics, soil mechanics, mechanics of materials, survey, reinforced concrete design, design project and construction materials.

In Year 3, the pathways will begin to diverge. Four modules (worth 60 credits) will be common across the different pathways; Project Planning, Procurement and Risk, Geotechnical Engineering, Integrated design project and Resilient Infrastructure and Transport (15 credits each). Two modules (worth 30 credits) will be specific to any pathway chosen by the student; these specialist modules are based on different topics such as; advanced structural analysis, water resources, flood and coastal engineering. All students will undertake an individual research project (worth 30 credits), the topic chosen will be aligned to the programme pathway, allowing further specialisation of learning and distinction between the pathway outcomes. Students who successfully complete and exit the programme at this stage will be eligible for a BEng (Hons) award, fully meeting the educational base required for an Incorporated Engineer (IEng) and partially meeting the educational base required for a Chartered Engineer (CEng).

Year 4 of the programme is when students progress to the MEng level of study. In this year a wider range of specialist modules will be offered and 3 common modules are delivered to all pathways in the programme, i.e. Year-long Group Project (30 credits), Project Management (15 credits) and Civil Engineering with Artificial Intelligence (15 credits). A wider range of specialist modules covering varied topics in advanced structural design and retrofitting, environmental management and pollution control, advanced flood and coastal engineering design will be available for each specialised pathway. Students who successfully complete and exit the programme at this stage will be eligible for an MEng (Hons) award, fully meeting the educational base required for a Chartered Engineer (CEng).

## 24.1 PROGRAMME AND INTERMEDIATE LEARNING OUTCOMES – BEng/MEng Civil Engineering

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:

Year and FHEQ level	Category (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)	Learning Group	Outcome	Engineering Council AHEP 4 Learning Outcome	Associated Modular Blocks Code(s)
Year 1 and FHEQ Level 4					
	K	C1-1: Science, mathematics and engineering principles	Demonstrate knowledge of the underlying concepts of mathematics, statistics, natural science and engineering principles through the solution of engineering problems.	BE1607 BE1608 BE1610 BE1611 BE1612 BE1605 CE1621	
	C	C2-1: Problem analysis	Sketch problems to reach sound conclusions using first principles of mathematics, statistics, natural science and engineering principles.	BE_1601a BE_1601b BE_1602 BE_1603a BE_1603b BE1612 BE1605	
	C	C3-1: Analytical tools and technics	Use appropriate computational and analytical techniques to model problems.	BE_1601a BE_1601b BE_1602 BE_1603a BE_1603b BE1612 BE1605	
	K,C,S	C5-1: Design	Explain solutions for engineering and other problems, with consideration of a range of societal, environmental and professional factors.	BE1609 CE1621	
	K,C	C6-1: Integrated/systems approach	Use an integrated or systems approach to the solution of an engineering problem.	CE1602 CE1621	
	K	C7-1: Sustainability	Describe the environmental and societal context of solutions to complex engineering problems and minimise adverse impacts.	BE1609 BE1610 BE1611 CE1621	
	C, S	C8-1: Ethics	Identify ethical concerns in an engineering context.	BE1609 CE1621	
	K	C9-1: Risk	Explain the basic principles of risk management in an engineering context.	BE1608 BE1609 CE1621	
	K	C10-1: Security	Describe the nature of security risks in an engineering context.	BE_1609 BE_1603a BE_1603b CE1621	

	C,S	<b>C12-1: Practical and workshop skills</b>	Effectively report on the use of practical laboratory and workshop skills to assess engineering problems.	BE_1603a BE_1603b BE1612 BE1605
	K,S	<b>C13-1: Materials, equipment, technologies and processes</b>	Describe appropriate materials, equipment, engineering technologies and processes.	BE1612 BE1605 CE1621
	K	<b>C15-1:</b>	Demonstrate the knowledge of engineering management principles, commercial context, project and change management.	BE1609
	S	<b>C16-1: Teamwork</b>	Demonstrate an understanding of how they function as an individual, and as a member of a team.	BE1609 CE1621
	S	<b>C17-1: Communication</b>	Use effective communication on engineering matters.	BE1607 BE1608 BE1609 BE1610 BE1610 BE1612 BE1605 CE1621
	S	<b>C18-1: Lifelong learning</b>	Demonstrate effective recording and reflection on self-learning and development.	BE1609 CE1621
<b>Year 2 and FHEQ Level 5</b>				
	K,C	<b>C1-2: Science, mathematics and engineering principles</b>	Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex civil engineering problems.	CE_23 CE_24 CE_25 CE_27 CE_28
	K,C	<b>C2-2: Problem analysis</b>	Identify and examine complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.	CE_22 CE_23 CE_24 CE_25 CE_26 CE_28 CE 2555
	K,C	<b>C3-2: Analytical tools and technics</b>	Select and apply appropriate computational and analytical techniques to model engineering problems, recognising the limitations of the techniques employed.	CE_21 CE_22 CE_23 CE_24 CE_25 CE_26 CE_28 CE 2555
	K,C	<b>C4-2: Technical literature</b>	Select and use technical literature and other sources of information to address complex civil engineering problems	CE_21 CE_26
	C,S	<b>C5-2: Design</b>	Analyse and evaluate design solutions for civil engineering problems that meet a combination of societal, user, business and customer needs, as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial	CE_21 CE_22 CE_26 CE_27 CE_28 CE 2555



			matters, codes of practice and industry standards.	
	K,C	<b>C6-2: Integrated/systems approach</b>	Apply an integrated or systems approach to the solution of civil engineering problems.	CE_22, CE_26, CE_27 CE 2555
	K,C	<b>C7-2: Sustainability</b>	Appraise the environmental and societal impact of solutions to complex problems and how adverse impacts including climate change can be mitigated.	CE_21 CE_26 CE_27
	C,S	<b>C8-2: Ethics</b>	Identify and examine ethical concerns and make reasoned ethical choices informed by professional codes of conduct.	CE_21 CE_26 CE_27
	C	<b>C9-2: Risk</b>	Use risk management process to identify, risks (the effects of uncertainty) associated with a particular project or activity and propose appropriate mitigations.	CE_21 CE_23 CE_26 CE 2555
	K,C	<b>C10-2: Security</b>	Identify and analyse the nature of security risks and appropriate mitigation in a civil engineering context.	CE_21
	K,C	<b>C11-2: Equality, diversity and inclusion</b>	Employ understanding of an inclusive approach to civil engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.	CE_26
	C	<b>C12-2: Practical and workshop skills</b>	Use practical laboratory and workshop skills to investigate civil engineering problems.	CE_21 CE_23 CE_25 CE_27CE_28 CE 2555
	K,S	<b>C13-2: Materials, equipment, technologies and processes</b>	Select and evaluate appropriate materials, equipment, engineering technologies and processes.	CE_21 CE_23 CE_27 CE 2555
	C	<b>C14-2: Quality management</b>	Examine the role of quality management systems and continuous improvement in the context of civil engineering problems.	CE_21
	K,C	<b>C15-2: Engineering and project management</b>	Analyse and evaluate engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.	CE_26
	C,S	<b>C16-2: Teamwork</b>	Apply relevant interpersonal, team and networking skills to reflect effectively on their performance as an individual, and as a member or leader of a team.	CE_21 CE_26 CE 2555
	S	<b>C17-2: Communication</b>	Organise and effectively communicate information on civil engineering matters with technical and non-technical audiences.	CE_21 CE_23 CE_26 CE_28

	C,S	<b>C18-2: Lifelong learning</b>	Take responsibility to plan and record self-learning and development as the foundation for lifelong learning/CPD.	CE_21 CE_26 CE 2555
<b>Year 3 and FHEQ Level 6</b>				
	K,C	<b>C1-3: Science, mathematics and engineering principles</b>	Select and apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex civil engineering problems. Some of the knowledge will be at the forefront of the particular subject of study	CE_31 CE_32 CE_33 CE_34 CE_35 CE_36
	K,C	<b>C2-3: Problem analysis</b>	Critically analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.	CE_31 CE_32 CE_33 CE_34 CE_35 CE_36 CE_37
	K,C	<b>C3-3: Analytical tools and technics</b>	Select and apply appropriate computational and analytical techniques to model complex civil engineering problems, recognising the limitations of the techniques employed.	CE_31 CE_32 CE_34 CE_35 CE_36 CE_37
	K,C	<b>C4-3: Technical literature</b>	Source and critically analyse technical literature and other sources of information to address complex civil engineering problems.	CE_31 CE_35 CE_36
	K,C	<b>C5-3: Design</b>	Design solutions for complex civil engineering problems that meet a combination of societal, user, business and customer needs, as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.	CE_31 CE_32 CE_35 CE_36 CE_37
	C	<b>C6-3: Integrated/systems approach</b>	Apply an integrated or systems approach to critically identify appropriate solutions of complex problems involving competing perspectives.	CE_31 CE_32 CE_34 CE_35 CE_36 CE_37
	K,C	<b>C7-3: Sustainability</b>	Critical analyse and evaluate the environmental and societal impact of civil engineering solutions to complex problems and minimise adverse impacts including climate change.	CE_31 CE_32 CE_33 CE_35 CE_36 CE_37
	C,S	<b>C8-3: Ethics</b>	Apply an in-depth awareness of ethical concerns with critical analysis to make reasoned ethical choices in contexts of varying complexity, informed by professional codes of conduct.	CE_31 CE_33 CE_35 CE_37
	C	<b>C9-3: Risk</b>	Synthesise relevant information and use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity in contexts of varying complexity.	CE_31 CE_33 CE_35 CE_36 CE_37



	C	<b>C10-3: Security</b>	Adopt a holistic and proportionate approach to the mitigation of security risks.	CE_31 CE_33 CE_35
	C,S	<b>C11-3: Equality, diversity and inclusion</b>	Adopt an inclusive approach to civil engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.	CE_31 CE_33 CE_35
	C,S	<b>C12-3: Practical and workshop skills</b>	Evaluate and use practical laboratory and workshop skills to investigate complex problems.	CE_31 CE_34 CE_36
	K,C	<b>C13-3: Materials, equipment, technologies and processes</b>	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations and evaluating the validity of results in contexts of varying complexity.	CE_31 CE_32 CE_35 CE_36
	K,C	<b>C14-3: Quality management</b>	Discuss the role of quality management systems and continuous improvement in the context of complex civil engineering problems.	CE_31 CE_33
	K,C	<b>C15-3: Engineering and project management</b>	Apply specialist knowledge of civil engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.	CE_31 CE_33 CE_35
	C,S	<b>C16-3: Teamwork</b>	Take responsibility for the critical evaluation of own and others' capabilities and development using selected management approaches in complex and inter-related contexts	CE_31 CE_35
	C,S	<b>C17-3: Communication</b>	Organise and communicate specialist and inter-related information, using selected criteria, to audiences in complex contexts.	CE_31 CE_35 CE_37
	C,S	<b>C18-3: Lifelong learning</b>	Plan, record and evaluate self-learning and development as the foundation for lifelong learning/CPD.	CE_31 CE_35
<b>Year 4 and FHEQ Level 7</b>				
	K,C	<b>M1: Science, mathematics and engineering principles</b>	Apply a systematic understanding of knowledge and specialist theoretical and methodological approaches, suggesting and incorporating interrelationships with other relevant disciplines in abstract and unpredictably complex contexts.	CE_51 CE5010 CE_54 CE5652
	K,C	<b>M2: Problem analysis</b>	Select and adapt appropriate advanced problem-solving strategies, methods and techniques to design systematic investigations that define and critically evaluate problems, using specialist information and data in unpredictable and complex contexts.	CE_51 CE5010 CE_54 CE5008 CE5652 CE_55
	K,C	<b>M3: Analytical tools and technics</b>	Systematically and critically analyse and evaluate, incomplete and/or contradictory data and evidence, developing effective and advanced methodologies to explain and support conclusions and recommendations in unpredictably complex contexts	CE_51 CE5010 CE_54 CE5652
	K,C	<b>M4: Technical literature</b>	Systematically synthesise advanced and specialist information and ideas, and formulate and develop innovative proposals	CE_51 CE_54 CE5008 CE_55

			to address strategic issues or opportunities in unpredictably complex contexts.	
	K,C	<b>M5: Design</b>	Design and develop advanced specialist projects and/or activities to strategically enhance own and/or others learning, work or practice within unpredictably complex contexts	CE_51 CE5015 CE5008 CE5652
	C	<b>M6: Integrated/systems approach</b>	Operate in abstract and unpredictably complex learning, work or practice contexts, requiring selection and application of advanced and specialist techniques and information sources	CE_51
	K,C	<b>M7: Sustainability</b>	Apply an understanding of knowledge about sustainability issues, recognising those areas where theories, ideas and concepts are most/least secure in contexts of varying complexity	CE_51 CE5015 CE5008 CE_55
	C,S	<b>M8: Ethics</b>	Apply knowledge of a range of relevant ethical and professional values and codes of conduct to personal and/or group decisions, actions, responsibilities and outcomes in contexts of varying complexity.	CE_51 CE5015 CE5008
	C	<b>M9: Risk</b>	Synthesise Information and ideas and formulates creative proposals to address a range of risk management issues in contexts of varying complexity	CE_51 CE5015 CE_54 CE_55
	C	<b>M10: Security</b>	Act with partial self-direction within relevant guidelines and accept responsibility for achieving safe and secure personal and/or group outcomes/outputs in wide-ranging contexts of varying complexity	CE_51 CE5015 CE_54 CE5008
	C,S	<b>M11: Equality, diversity and inclusion</b>	Apply an awareness values and codes of conduct related to equality, diversity and inclusion to personal and/or group decisions, actions, responsibilities and outcomes in contexts of varying complexity	CE_51 CE5015 CE5008
	C,S	<b>M12: Practical and workshop skills</b>	Operate in work or practice contexts of varying complexity requiring the application of a wide range of techniques and skills.	CE_51 CE5652 CE_55
	K,C	<b>M13: Materials, equipment, technologies and processes</b>	Apply an understanding of wide-ranging areas of knowledge to formulates creative proposals that address a range of issues or opportunities in contexts of varying complexity	CE_51 CE5652
	K,C	<b>M14: Quality management</b>	Design and develop a range of relevant projects and/or activities to improve personal and/or group outcomes/outputs in wide-ranging contexts of varying complexity.	CE_51 CE5015 CE_55
	K,C	<b>M15: Engineering and project management</b>	Design and develop a range of relevant projects and/or activities to define and investigate problems, patterns and relationships using information and data in contexts of varying complexity.	CE_51 CE5015 CE_55
	C,S	<b>M16: Teamwork</b>	Take responsibility for leading the systematic and critical evaluation of own and others' capabilities, performance and development, applying strategic management approaches in unpredictably complex contexts.	CE_51 CE_54 CE5008 CE_55

	C,S	<b>M17: Communication</b>	Organise and communicate information, using a range of relevant criteria, to a variety of audiences in contexts of varying complexity.	CE_51 CE_54 CE5008 CE_55
	C,S	<b>M18: Lifelong learning</b>	Apply a systematic understanding of knowledge and specialist theoretical and methodological approaches, suggesting and incorporating interrelationships with other relevant disciplines in abstract and unpredictably complex contexts.	CE_51

## 24.2 PROGRAMME AND INTERMEDIATE LEARNING OUTCOMES – BEng/MEng Civil Engineering (Environmental Engineering pathway) programme

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>Year and FHEQ level</b>	<b>Category (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)</b>	<b>Learning Outcome Group</b>	<b>Engineering Council AHEP 4 Learning Outcome</b>	<b>Associated Modular Blocks Code(s)</b>
<b>Year 1 and FHEQ Level 4 (), see Table 24.1.</b>				
Identical to BEng/MEng Civil Engineering, see Table 24.1.				
<b>Year 2 and FHEQ Level 5</b>				
Identical to BEng/MEng Civil Engineering, see Table 24.1.				
<b>Year 3 and FHEQ Level 6</b>				
	K,C	<b>C1-3: Science, mathematics and engineering principles</b>	Select and apply specialist knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex civil engineering problems. Some of the knowledge will be at the forefront of the particular subject of study.	CE_39 CE_40 CE_43
	K,C	<b>C2-3: Problem analysis</b>	Critically analyse complex problems involving synthesis of specialist information to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.	CE_31 CE_33 CE_35 CE_37 CE_39 CE_40 CE_43
	K,C	<b>C3-3: Analytical tools and technics</b>	Select and apply specialist computational and analytical techniques to model complex civil engineering problems, recognising the limitations of the techniques employed, both in general and specific to a given practical context	CE_31 CE_35 CE_37 CE_39 CE_40 CE_43
	K,C	<b>C4-3: Technical literature</b>	Source and critically analyse relevant technical literature together with other sources of specialist information and ideas to address civil engineering problems in complex and inter-related contexts.	CE_31 CE_35
	K,C	<b>C5-3: Design</b>	Design solutions for complex civil engineering problems that meet a combination of societal, user, business and	CE_31 CE_35 CE_37

			customer needs, as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.	CE_39 CE_40 CE_43
	C	<b>C6-3: Integrated/systems approach</b>	Apply an integrated or systems approach to critically identify appropriate solutions of complex problems involving competing perspectives.	CE_31 CE_35 CE_37 CE_39 CE_40 CE_43
	K,C	<b>C7-3: Sustainability</b>	Critically analyse and evaluate the environmental and societal impact of civil engineering solutions to complex problems and minimise adverse impacts including climate change.	CE_31 CE_33 CE_35 CE_37 CE_39 CE_40 CE_43
	C,S	<b>C8-3: Ethics</b>	Apply an in-depth awareness of ethical concerns with critical analysis to make reasoned ethical choices in contexts of varying complexity, informed by professional codes of conduct.	CE_31 CE_33 CE_35 CE_37 CE_39 CE_40 CE_43
	C	<b>C9-3: Risk</b>	Synthesise relevant information and use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity in contexts of varying complexity.	CE_31 CE_33 CE_35
	C	<b>C10-3: Security</b>	Adopt a holistic and proportionate approach to the mitigation of security risks.	CE_31 CE_33 CE_35
	C,S	<b>C11-3: Equality, diversity and inclusion</b>	Adopt an inclusive approach to civil engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.	CE_31 CE_35
	C,S	<b>C12-3: Practical and workshop skills</b>	Evaluate and use practical laboratory and workshop skills to investigate complex problems.	CE_31 CE_39
	K,C	<b>C13-3: Materials, equipment, technologies and processes</b>	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations and evaluating the validity of results in contexts of varying complexity.	CE_31 CE_35 CE_39 CE_40 CE_43
	K,C	<b>C14-3: Quality management</b>	Discuss the role of quality management systems and continuous improvement in the context of complex civil engineering problems.	CE_31 CE_33
	K,C	<b>C15-3: Engineering and project management</b>	Apply specialist knowledge of civil engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.	CE_31 CE_33 CE_35
	C,S	<b>C16-3: Teamwork</b>	Take responsibility for the critical evaluation of own and others' capabilities and development using selected	CE_31 CE_35
	C,S	<b>C17-3: Communication</b>	Organise and communicate specialist and inter-related information, using selected criteria, to audiences in complex contexts	CE_31 CE_35 CE_39

	C,S	<b>C18-3: Lifelong learning</b>	Plan, record and evaluate self-learning and development as the foundation for lifelong learning/CPD.	CE_31 CE_35
<b>Year 4 and FHEQ Level 7</b>				
	K,C	<b>M1: Science, mathematics and engineering principles</b>	Apply a systematic understanding of knowledge and specialist theoretical and methodological approaches, suggesting and incorporating interrelationships with other relevant disciplines in abstract and unpredictably complex contexts.	CE_51 CE_54 CE_58 CE_61
	K,C	<b>M2: Problem analysis</b>	Select and adapt appropriate advanced problem-solving strategies, methods and techniques to design systematic investigations that define and critically evaluate problems, using specialist information and data in unpredictable and complex contexts.	CE_51 CE_54 CE_58 CE5008
	K,C	<b>M3: Analytical tools and technics</b>	Systematically and critically analyse and evaluate, incomplete and/or contradictory data and evidence, developing effective and advanced methodologies to explain and support conclusions and recommendations in unpredictably complex contexts	CE_51 CE_54 CE_58 CE_60 CE_61
	K,C	<b>M4: Technical literature</b>	Systematically synthesise advanced and specialist information and ideas, and formulate and develop innovative proposals to address strategic issues or opportunities in unpredictably complex contexts.	CE_51 CE_54 CE5008 CE_60 CE_61
	K,C	<b>M5: Design</b>	Design and develop advanced specialist projects and/or activities to strategically enhance own and/or others learning, work or practice within unpredictably complex contexts	CE_51 CE5015 CE_58 CE5008 CE_60 CE_61
	C	<b>M6: Integrated/systems approach</b>	Operate in abstract and unpredictably complex learning, work or practice contexts, requiring selection and application of advanced and specialist techniques and information sources	CE_51 CE_60 CE_61
	K,C	<b>M7: Sustainability</b>	Apply an understanding of knowledge about sustainability issues, recognising those areas where theories, ideas and concepts are most/least secure in contexts of varying complexity	CE_51 CE5015 CE_58 CE5008 CE_60 CE_61
	C,S	<b>M8: Ethics</b>	Apply an awareness of a range of relevant ethical and professional values and codes of conduct to personal and/or group decisions, actions, responsibilities and outcomes in contexts of varying complexity.	CE_51 CE5015 CE5008
	C	<b>M9: Risk</b>	Synthesise information and ideas, and formulate creative proposals to address a range of risk management issues in contexts of varying complexity	CE_51 CE5015 CE_54 CE_60 CE_61
	C	<b>M10: Security</b>	Act with partial self-direction within relevant guidelines and accepts responsibility for achieving safe and secure personal and/or group outcomes/outputs in wide-ranging contexts of varying complexity	CE_51 CE5015 CE_54 CE_58 CE5008 CE_60

	C,S	<b>M11: Equality, diversity and inclusion</b>	Apply an awareness values and codes of conduct related to equality, diversity and inclusion to personal and/or group decisions, actions, responsibilities and outcomes in contexts of varying complexity.	CE_51 CE5015 CE5008
	C,S	<b>M12: Practical and workshop skills</b>	Operate in work or practice contexts of varying complexity requiring the application of a wide range of techniques and skills.	CE_51 CE_61
	K,C	<b>M13: Materials, equipment, technologies and processes</b>	Apply an understanding of wide-ranging areas of knowledge to formulate creative proposals that address a range of issues or opportunities in contexts of varying complexity	CE_51 CE_58 CE_60 CE_61
	K,C	<b>M14: Quality management</b>	Design and develop a range of relevant projects and/or activities to improve personal and/or group outcomes/outputs in wide-ranging contexts of varying complexity.	CE_51 CE5015 CE_61
	K,C	<b>M15: Engineering and project management</b>	Design and develop a range of relevant projects and/or activities to define and investigate problems, patterns and relationships using information and data in contexts of varying complexity.	CE_51 CE5015 CE_58 CE_60 CE_61
	C,S	<b>M16: Teamwork</b>	Take responsibility for leading the systematic and critical evaluation of own and others' capabilities, performance and development, applying strategic management approaches in unpredictably complex contexts.	CE_51 CE_54 CE_58 CE5008
	C,S	<b>M17: Communication</b>	Organise and communicate information, using a range of relevant criteria, to a variety of audiences in contexts of varying complexity.	CE_51 CE_54 CE_58 CE5008 CE_60 CE_61
	C,S	<b>M18: Lifelong learning</b>	Apply a systematic understanding of knowledge and specialist theoretical and methodological approaches, suggesting and incorporating interrelationships with other relevant disciplines in abstract and unpredictably complex contexts.	CE_51

#### 24.3 PROGRAMME AND INTERMEDIATE LEARNING OUTCOMES – BEng/MEng Civil Engineering (Flood and Coastal Engineering pathway) programme

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:

Year and FHEQ level	Category (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)	Learning Group	Outcome	Engineering Council AHEP 4 Learning Outcome	Associated Modular Blocks Code(s)
<b>Year 1 and FHEQ Level 4 ( ), see Table 24.1.</b>					
Identical to BEng/MEng Civil Engineering, see Table 24.1.					



Year 2 and FHEQ Level 5				
Identical to BEng/MEng Civil Engineering, see Table 24.1.				
Year 3 and FHEQ Level 6				
	K,C	<b>C1-3: Science, mathematics and engineering principles</b>	Select and apply specialist knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex civil engineering problems. Some of the knowledge will be at the forefront of the particular subject of study	CE_36 CE_40 CE_41
	K,C	<b>C2-3: Problem analysis</b>	Critically analyse complex problems involving synthesis of specialist information to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.	CE_31 CE_33 CE_35 CE_36 CE_40 CE_41
	K,C	<b>C3-3: Analytical tools and technics</b>	Select and apply specialist computational and analytical techniques to model complex civil engineering problems, recognising the limitations of the techniques employed, both in general and specific to a given practical context.	CE_31 CE_35 CE_36 CE_40 CE_41
	K,C	<b>C4-3: Technical literature</b>	Source and critically analyse relevant technical literature together with other sources of specialist information and ideas to address civil engineering problems in complex and inter-related contexts.	CE_31 CE_35 CE_41
	K,C	<b>C5-3: Design</b>	Design solutions for complex civil engineering problems that meet a combination of societal, user, business and customer needs, as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.	CE_31 CE_35 CE_36 CE_40 CE_42
	C	<b>C6-3: Integrated/systems approach</b>	Apply an integrated or systems approach to critically identify appropriate solutions of complex problems involving competing perspectives.	CE_31 CE_35 CE_36 CE_40 CE_42
	K,C	<b>C7-3: Sustainability</b>	Critically analyse and evaluate the environmental and societal impact of civil engineering solutions to complex problems and minimise adverse impacts including climate change.	CE_31 CE_33 CE_35 CE_36 CE_40 CE_41 CE_42
	C,S	<b>C8-3: Ethics</b>	Apply an in-depth awareness of ethical concerns with critical analysis to make reasoned ethical choices in contexts of varying complexity, informed by professional codes of conduct.	CE_31 CE_33 CE_35 CE_40 CE_42
	C	<b>C9-3: Risk</b>	Synthesise relevant information and use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity in contexts of varying complexity.	CE_31 CE_33 CE_35 CE_41 CE_42

	C	<b>C10-3: Security</b>	Adopt a holistic and proportionate approach to the mitigation of security risks.	CE_31 CE_33 CE_35 CE_41 CE_42
	C,S	<b>C11-3: Equality, diversity and inclusion</b>	Adopt an inclusive approach to civil engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.	CE_31 CE_35 CE_42
	C,S	<b>C12-3: Practical and workshop skills</b>	Evaluate practical laboratory and workshop skills to investigate complex problems.	CE_31 CE_36 CE_42
	K,C	<b>C13-3: Materials, equipment, technologies and processes</b>	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations and evaluating the validity of results in contexts of varying complexity.	CE_31 CE_35 CE_36 CE_40 CE_41
	K,C	<b>C14-3: Quality management</b>	Discuss the role of quality management systems and continuous improvement in the context of complex civil engineering problems.	CE_31 CE_33 CE_42
	K,C	<b>C15-3: Engineering and project management</b>	Apply specialist knowledge of civil engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.	CE_31 CE_33 CE_35 CE_42
	C,S	<b>C16-3: Teamwork</b>	Take responsibility for the critical evaluation of own and others' capabilities and development using selected management approaches in complex and inter-related contexts.	CE_31 CE_35
	C,S	<b>C17-3: Communication</b>	Organise and communicate specialist and inter-related information, using selected criteria, to audiences in complex contexts.	CE_31 CE_35 CE_36 CE_42
	C,S	<b>C18-3: Lifelong learning</b>	Plan, record and evaluate self-learning and development as the foundation for lifelong learning/CPD.	CE_31 CE_35
<b>Year 4 and FHEQ Level 7</b>				
	K,C	<b>M1: Science, mathematics and engineering principles</b>	Apply a systematic understanding of knowledge and specialist theoretical and methodological approaches, suggesting and incorporating interrelationships with other relevant disciplines in abstract and unpredictably complex contexts.	CE_51 CE_54 CE_62 CE_66
	K,C	<b>M2: Problem analysis</b>	Select and adapt appropriate advanced problem-solving strategies, methods and techniques to design systematic investigations that define and critically evaluate problems, using specialist information and data in unpredictable and complex contexts.	CE_51 CE_54 CE_62 CE_66
	K,C	<b>M3: Analytical tools and technics</b>	Systematically and critically analyse and evaluate incomplete and/or contradictory data and evidence, developing effective and advanced methodologies to explain and support conclusions and recommendations in unpredictably complex contexts	CE_51 CE_54 CE_66
	K,C	<b>M4: Technical literature</b>	Systematically synthesise advanced and specialist information and ideas, and	CE_51 CE_54

			formulate and develop innovative proposals to address strategic issues or opportunities in unpredictably complex contexts.	CE_62 CE_66
	K,C	<b>M5: Design</b>	Design and develop advanced specialist projects and/or activities to strategically enhance own and/or others learning, work or practice within unpredictably complex contexts	CE_51 CE_62 CE_68 CE_64 CE_66
	C	<b>M6: Integrated/systems approach</b>	Operate in abstract and unpredictably complex learning, work or practice contexts, requiring selection and application of advanced and specialist techniques and information sources	CE_51 CE_62 CE_68 CE_64 CE_66
	K,C	<b>M7: Sustainability</b>	Apply an understanding of knowledge about sustainability issues, recognising those areas where theories, ideas and concepts are most/least secure in contexts of varying complexity	CE_51 CE_62 CE_68 CE_64 CE_66
	C,S	<b>M8: Ethics</b>	Apply an awareness of a range of relevant ethical and professional values and codes of conduct to personal and/or group decisions, actions, responsibilities and outcomes in contexts of varying complexity.	CE_51 CE_68 CE_64
	C	<b>M9: Risk</b>	Synthesise information and ideas, and formulate creative proposals to address a range of risk management issues in contexts of varying complexity	CE_51 CE_54 CE_62 CE_64 CE_66
	C	<b>M10: Security</b>	Act with partial self-direction within relevant guidelines, and accept responsibility for achieving safe and secure personal and/or group outcomes/outputs in wide-ranging contexts of varying complexity	CE_51 CE_54 CE_64 CE_66 CE_68
	C,S	<b>M11: Equality, diversity and inclusion</b>	Apply an awareness values and codes of conduct related to equality, diversity and inclusion to personal and/or group decisions, actions, responsibilities and outcomes in contexts of varying complexity	CE_51CE_62 CE_64 CE_66 CE_68
	C,S	<b>M12: Practical and workshop skills</b>	Operate in work or practice contexts of varying complexity requiring the application of a wide range of techniques and skills	CE_51 CE_64 CE_66
	K,C	<b>M13: Materials, equipment, technologies and processes</b>	Apply an understanding of wide-ranging areas of knowledge to formulate creative proposals that address a range of issues or opportunities in contexts of varying complexity	CE_51 CE_62 CE_64 CE_66
	K,C	<b>M14: Quality management</b>	Design and develop a range of relevant projects and/or activities to improve personal and/or group outcomes/outputs in wide-ranging contexts of varying complexity	CE_51 CE_62 CE_66 CE_68
	K,C	<b>M15: Engineering and project management</b>	Design and develop a range of relevant projects and/or activities to define and investigate problems, patterns and relationships using information and data in contexts of varying complexity	CE_51 CE_62 CE_64 CE_66 CE_68
	C,S	<b>M16: Teamwork</b>	Take responsibility for leading the systematic and critical evaluation of own and others' capabilities, performance and development, applying strategic	CE_51 CE_54 CE_62 CE_68

			management approaches in unpredictably complex contexts.	
	C,S	<b>M17: Communication</b>	Organise and communicate information, using a range of relevant criteria, to a variety of audiences in contexts of varying complexity.	CE_51 CE_54 CE_62 CE_68 CE_64 CE_66
	C,S	<b>M18: Lifelong learning</b>	Take responsibility for the evaluation of own and/or others' capabilities and development using wide-ranging approaches and criteria in contexts of varying complexity.	CE_51

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

Years 1 and 2 (FHEQ Level 4 and 5) will provide students with fundamental knowledge of core engineering subjects, e.g. engineering mathematics, structural mechanics, construction materials science, hydraulics etc. Course delivery will be based on a combination of theory, practical sessions and project work. Students will be introduced to industry-relevant software tools, which will be followed by the process of developing their skills through the practical use of the software when solving engineering problems. Field trips will be employed to enable students to witness how engineering projects are practically designed and implemented in real-life settings. Assessments will include individual and group coursework/assignments, and exams. Individual coursework/assignments and exams will test knowledge and understanding of fundamental principles of engineering science and mathematics. Group projects will provide students with opportunities to learn how complex engineering problems are solved through the combined application of specialist knowledge in a range of different subject areas.

Year 3 and 4 (FHEQ Level 6 and 7) will continue the strategy of using mixed teaching and learning techniques, and assessment methods. Students will deepen their knowledge and understanding of various systems used to design sustainable solutions to engineering problems. An integrated design project will give students an opportunity to develop skills in the design of solutions to more complex civil engineering problems. These years will also include an option for students who wish to learn more about the application of Building Information Modelling (BIM), a software-based technique used to manage engineering projects. Research, independent learning and critical analysis skills will be further developed when students complete an individual dissertation project.

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

The summative assessment strategy is designed to ensure that students are provided with more than one opportunity to achieve a learning outcome at each level of the programme. The strategy will also ensure that most learning outcomes are assessed at least once at each level of the programme.

As a general strategy, teaching blocks will include both coursework and examination methods of summative assessments. Modules that only use coursework-based summative assessments are restricted to the engineering practice modules in Year 1, the group design project in Year 2, the final year dissertation and integrated design project in Year 3 and the group project in Year 4.

## 25. Programme Structure, progression and award requirements

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

- **Compulsory block:** one that 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 that students choose from an 'option range'. These will be listed in the right-hand column;
- **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 in order to be eligible for the final award. Core assessments may be described in one of three ways:
  1. Where students are expected to pass the block at D- or better, but not necessarily all elements of assessment, then the block itself is core.  
e.g. AB3000 Project (40 credits)  
**Core: Block**
  2. Where only some elements of assessments are required to be passed at D- or better, these will be identified by listing each element of assessment that is core  
e.g. AB3001 Title (20 credits)  
**Core: 1 & 4**
  3. 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.  
e.g. AB3002 Title (20 credits)  
**Core: All, Block**
- **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 is available for students specified in document “Validated Programme Element Specification for BPC Alternative Foundation in Engineering”. This document also specifies the admission and progression requirements.

Year 1 (FHEQ Level 4) – same for all 3 pathways	
<b>Compulsory modular block codes, titles and credits</b>  BE1610 Engineering Systems and Energy I (15 credits) BE1611 Engineering Systems and Energy II (15 credits) BE1612 Engineering Mechanics - Statics (15 credits) BE1605 Engineering Mechanics and Materials I (15 credits) BE1607 Engineering Mathematics and Programming I (15 credits) – <b>Core Block</b> BE1608 Engineering Mathematics and Programming II (15 credits) – <b>Core Block</b> BE1609 Engineering Practice (15 credits) – <b>Core Block</b> CE1621 Civil Engineering Principles and Practice (15 credits)	<b>Optional modular block codes, titles and credits</b>
<b>Level 4 Progression and Award Requirements</b>  As per <a href="#">Senate Regulation 2</a>	

Year 2 (FHEQ Level 5) – same for all 3 pathways	
<b>Compulsory assessment block codes, titles and credits</b>	<b>Optional assessment block codes, titles and credits</b>
<b>Compulsory study block codes, titles and credit volume</b>	<b>Optional Study block codes, titles and credit volume</b>
<b>Compulsory modular block codes, titles and credits</b> CE_21 Civil Engineering Toolbox & Surveying (15 credits) CE_22 Reinforced Concrete Design (15 credits) CE_23 Soil Mechanics (15 credits) CE_24 Structural Mechanics 1 (15 credits) CE_25 Structural Mechanics 2 (15 credits) CE_27 Construction Materials & Sustainability (15 credits) CE_28 Fluid Mechanics and Hydraulics (15 credits) CE_26 Design Project (15 credits) – <b>Core Block</b>	<b>Optional modular block codes, titles and credits</b>
<b>Level 5 Progression and Award Requirements</b>  As per <a href="#">Senate Regulation 2</a>	

Level 5 – Placement – same for all 3 pathways	
<b>Compulsory assessment block codes, titles and credits</b>	<b>Optional assessment block codes, titles and credits</b>



Compulsory study block codes, titles and credit volume	Optional study block codes, titles and credit volume
Compulsory modular block codes, titles and credits	Optional modular block codes, titles and credits
CE2555 Civil Engineering Placement (120) - <b>Core Block</b>	
<b>Level 5 Placement Progression and Award Requirements</b>  <b>As per <a href="#">Senate Regulation 2</a></b>  For students who are registered to the following BEng programmes, CE2555 will contribute 25% of the FHEQ Level 5 profile and 8.3% of the overall degree calculation; CE2555 must be undertaken between Levels 5 & 6. <ul style="list-style-type: none"> <li>• BEng (Hons) Civil Engineering (Flood and Coastal Engineering) with Placement (FHEQ level 6)</li> <li>• BEng (Hons) Civil Engineering with Placement (FHEQ level 6)</li> <li>• BEng (Hons) Civil Engineering (Environmental Engineering) with Placement (FHEQ level 6)</li> </ul> For students who are registered to the following MEng programmes, CE2555 will contribute 25% of the FHEQ Level 5 profile and 5% of the overall degree calculation; CE2555 must be undertaken between Levels 5 & 6 or 6 & 7. <ul style="list-style-type: none"> <li>• MEng (Hons) Civil Engineering with Placement (FHEQ level 7))</li> <li>• MEng (Hons) Civil Engineering (Environmental Engineering) with Placement (FHEQ level 7))</li> <li>• MEng (Hons) Civil Engineering (Flood and Coastal Engineering) with Placement (FHEQ level 7))</li> </ul> If a student fails CE2555 (e.g. E+ or less), she/he may be allowed to be re-registered to the BEng or MEng programme (but without “with Placement” in the final award).	

Year 3 (FHEQ Level 6) – BEng/MEng Civil Engineering	
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
<b>Compulsory modular block codes, titles and credits</b> CE_33 Project Planning, Procurement and Risk (15 credits) CE_36 Geotechnical Engineering (15 credits) CE_37 Resilient Infrastructure and Transport (15 credits) CE_35 Integrated design project (15 credits) CE_31 Final Year Individual Project (30 credits) – <b>Core Block</b> CE_32 Design of Steel and Timber Structures (15 credits) – <b>Core Block</b> CE_34 Computational Structural Analysis (15 credits) – <b>Core Block</b>	<b>Optional modular block codes, titles and credits</b>

## Level 6 Progression and Award Requirements

### As per [Senate Regulation 2](#)

Students must achieve all AHEP learning outcomes (see attachment) to get an accredited degree.

For an accredited award, students may not be allowed an aegrotat pass on any module or have more than 30 credits of allowed failure (E-, E or E+ at Levels 4 – 6; D-, D, D+ at level 7) throughout their entire profile.

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.

## Year 3 (FHEQ Level 6) – BEng/MEng Civil Engineering (Environmental Engineering)

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
<b>Compulsory modular block codes, titles and credits</b> CE_37 Resilient Infrastructure and Transport (15 credits) CE_33 Project Planning, Procurement and Risk (15 credits) CE_35 Integrated design project (15 credits) CE_31 Final Year Individual Project (Environmental Engineering) (30 credits) – <b>Core Block</b> CE_39 Water and Wastewater Infrastructure Design (15 credits) – <b>Core Block</b> CE_43 Geo-energy Engineering (15 credits) – <b>Core Block</b> CE_40 Environmental Management and Pollution Control (15 credits) – <b>Core Block</b>	<b>Optional modular block codes, titles and credits</b>

## Level 6 Progression and Award Requirements

### As per [Senate Regulation 2](#)

Students must achieve all AHEP learning outcomes (see attachment) to get an accredited degree.

For an accredited award, students may not be allowed an aegrotat pass on any module or have more than 30 credits of allowed failure (E-, E or E+ at Levels 4 – 6; D-, D, D+ at level 7) throughout their entire profile.

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.

## Year 3 (FHEQ Level 6) – BEng/MEng Civil Engineering (Flood and Coastal Engineering)

Compulsory assessment block codes, titles and credits	Optional assessment block codes, titles and credits
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Compulsory study block codes, titles and credit volume	Optional study block codes, titles and credit volume
<b>Compulsory modular block codes, titles and credits</b> CE_33 Project Planning, Procurement and Risk (15 credits) CE_35 Integrated design project (15 credits) CE_36 Geotechnical Engineering (15 credits) CE_31 Final Year Individual Project (Flood and Coastal Engineering) (30 credits) – <b>Core Block</b> CE_40 Environmental Management and Pollution Control (15 credits) – <b>Core Block</b> CE_41 Flood modelling and analysis (15 credits) – <b>Core Block</b> CE_42 Flood and coastal infrastructure Design (15 credits) – <b>Core Block</b>	<b>Optional modular block codes, titles and credits</b>
<b>Level 6 Progression and Award Requirements</b>  <b>As per <a href="#">Senate Regulation 2</a></b>  Students must achieve all AHEP learning outcomes (see attachment) to get an accredited degree.  For an accredited award, students may not be allowed an aegrotat pass on any module or have more than 30 credits of allowed failure (E-, E or E+ at Levels 4 – 6; D-, D, D+ at level 7) throughout their entire profile.  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.	

Year 4 (FHEQ Level 7) – MEng Civil Engineering	
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
<b>Compulsory modular block codes, titles and credits</b> CE5015 Project Management (15 credits) CE5010 Advanced structural Design and FEA (15 credits) CE_54 Civil Engineering with Artificial Intelligence (15 credits) CE5008 Geo-Environmental Engineering (15 credits) CE5652 Structural Dynamics and Seismic Design (15 credits) CE_55 Advanced construction materials and retrofitting (15 credits) CE_51 Year-long Group Project (30 credits) – <b>Core Block</b>	<b>Optional modular block codes, titles and credits</b>

## Level 7 Progression and Award Requirements

### As per [Senate Regulation 2](#)

Students must achieve all AHEP learning outcomes (see attachment) to get an accredited degree.

For an accredited award, students may not be allowed an aegrotat pass on any module or have more than 30 credits of allowed failure (E-, E or E+ at Levels 4 – 6; D-, D, D+ at level 7) throughout their entire profile.

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.

## Year 4 (FHEQ Level 7) – MEng Civil Engineering (Environmental Engineering)

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
<b>Compulsory modular block codes, titles and credits</b> CE5015 Project Management (15 credits) CE_54 Civil Engineering with Artificial Intelligence (15 credits) CE5008 Geo-Environmental Engineering (15 credits) CE_58 Water Infrastructure Engineering (15 credits) CE_60 Water Process Engineering (15 credits) CE_61 Climate Change and the Environment (15 credits) CE_51 Year-long Group Project (30 credits) – <b>Core Block</b>	<b>Optional modular block codes, titles and credits</b>

## Level 7 Progression and Award Requirements

### As per [Senate Regulation 2](#)

Students must achieve all AHEP learning outcomes (see attachment) to get an accredited degree.

For an accredited award, students may not be allowed an aegrotat pass on any module or have more than 30 credits of allowed failure (E-, E or E+ at Levels 4 – 6; D-, D, D+ at level 7) throughout their entire profile.

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.

## Year 4 (FHEQ Level 7) – MEng Civil Engineering (Flood and Coastal Engineering)

Compulsory assessment block codes, titles and credits	Optional assessment block codes, titles and credits
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Compulsory study block codes, titles and credit volume	Optional study block codes, titles and credit volume
<b>Compulsory modular block codes, titles and credits</b> CE_54 Civil Engineering with artificial intelligence (15 credits) CE_62 Advanced Flood and coastal engineering Design (15 credits) CE_68 Sustainable infrastructure project (15 credits) CE_61 Climate change and the environment (15 credits) CE_66 Smart and resilient flood and coastal engineering (15 credits) CE_64 Flood and coastal asset management (15 credits) CE_51 Year-long Group Project (30 credits) – <b>Core Block</b>	<b>Optional modular block codes, titles and credits</b>
<b>Level 7 Progression and Award Requirements</b>  <b>As per <a href="#">Senate Regulation 2</a></b>  Students must achieve all AHEP learning outcomes (see attachment) to get an accredited degree.  For an accredited award, students may not be allowed an aegrotat pass on any module or have more than 30 credits of allowed failure (E-, E or E+ at Levels 4 – 6; D-, D, D+ at level 7) throughout their entire profile.	
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.	

## Appendix: Mapping to AHEP4 Learning Outcomes (JBM Appendix C Mapping to AHEP4 Learning Outcomes)

JBM Appendix C Mapping to AHEP4 Learning Outcomes for  
BEng Civil Engineering

Level	Module code	Module title	Core (C) or Optional (O)	Credit Value	Assessment	Science and Maths	Engineering Analysis				Design and Innovation		The Engineer and Society					Engineering Practice							
						C	S	E	D	I	D	I	S	E	C	C	C	C	C	C	C	C	C	C	
						Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study	Analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles	Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed	Select and evaluate technical literature and other sources of information to address complex problems	Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards	Apply an integrated or systems approach to the solution of complex problems	Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts	Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct	Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity	Adopt a holistic and proportionate approach to the mitigation of security risks (new for AHEP4)	Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion (new for AHEP4)	Use practical laboratory and workshop skills to investigate complex problems	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations	Discuss the role of quality management systems and continuous improvement in the context of complex problems	Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights	Function effectively as an individual, and as a member or leader of a team	Communicate effectively on complex engineering matters with technical and non-technical audiences	Plan and record self-learning and development as the foundation for lifelong learning/CPD		
Year 1	BE_1601a	Engineering Mathematics and Programming I (15 credits)	C	15	E/C	Yes	Yes	Yes						Yes								Yes			
	BE_1601b	Engineering Mathematics and Programming II (15 credits)	C	15	E/C	Yes	Yes	Yes						Yes								Yes			
	BE_1602	Engineering Practice (15 credits)	C	15	E/C	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	Yes	
	BE_1603a	Engineering Systems and Energy I (15 credits)	C	15	E/C	Yes	Yes	Yes					Yes	Yes	Yes			Yes				Yes	Yes		
	BE_1603b	Engineering Systems and Energy II (15 credits)	C	15	E/C	Yes	Yes	Yes					Yes	Yes	Yes			Yes				Yes	Yes		
	BE1604	Engineering Mechanics - Statics (15 credits)	C	15	E/C	Yes	Yes	Yes										Yes	Yes				Yes		
Year 2	BE1605	Engineering Mechanics and Materials I (15 credits)	C	15	E/C	Yes		Yes									Yes					Yes			
	CE160X	Civil Engineering Principles and Practice (15 credits)	C	15	C	Yes				Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes			Yes	Yes	Yes	Yes	
	CE_21	Civil Engineering Toolbox & Surveying (15 credits)	C	15	C			Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	
	CE_22	Reinforced Concrete Design (15 credits)	C	15	E/C		Yes	Yes		Yes	Yes							Yes				Yes			
	CE_23	Soil Mechanics (15 credits)	C	15	E/C	Yes	Yes	Yes						Yes				Yes	Yes				Yes		
	CE_24	Structural Mechanics 1 (15 credits)	C	15	E/C	Yes	Yes	Yes																	
	CE_25	Structural Mechanics 2 (15 credits)	C	15	E/C	Yes	Yes	Yes										Yes							
	CE_26	Design Project (15 credits)	C	15	C		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes				Yes	Yes	Yes	Yes	
	CE_27	Construction Materials & Sustainability (15 credits)	C	15	E/C	Yes				Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes						
	CE_28	Fluid Mechanics and Hydraulics (15 credits)	C	15	E/C	Yes	Yes	Yes		Yes								Yes					Yes		
Year 3	CE 2555	Civil Engineering Placement		120	C		Yes	Yes		Yes	Yes				Yes			Yes	Yes			Yes		Yes	
	CE_31	Final Year Individual Project (30 credits)	C	30	C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	CE_32	Design of Steel and Timber Structures (15 credits)	C	15	E/C	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes			Yes							
	CE_33	Project Planning, Procurement and Risk (15 credits)	C	15	E/C	Yes	Yes					Yes	Yes	Yes	Yes	Yes		Yes			Yes				
	CE_34	Computational Structural Analysis (15 credits)	C	15	E/C	Yes	Yes	Yes			Yes							Yes							
	CE_35	Integrated design project (15 credits)	C	15	C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	
	CE_36	Geotechnical Engineering (15 credits)	C	15	E/C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes			Yes	Yes	Yes	Yes	
CE_37	Resilient Infrastructure and Transport (15 credits)	C	15	E/C		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes							
MEng Civil Engineering						M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18		
	CE_51	Year-long Group Project (30 credits)	C	30	C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	CE5015	Project Management (15 credits)	C	15	E/C					Yes		Yes	Yes	Yes	Yes	Yes			Yes	Yes					
	CE5010	Advanced structural Design and FEA (15 credits)	C	15	E/C	Yes	Yes	Yes											Yes	Yes					
	CE_54	Civil Engineering with Artificial Intelligence (15 credits)	C	15	E/C	Yes	Yes	Yes	Yes					Yes	Yes							Yes	Yes		
	CE5008	Geo-Environmental Engineering (15 credits)	C	15	E/C	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes					Yes	Yes	Yes		
	CE5652	Structural Dynamics and Seismic Design (15 credits)	C	15	E/C	Yes	Yes	Yes		Yes							Yes	Yes		Yes	Yes	Yes	Yes		
	CE_55	Advanced construction materials and retrofitting (15 credits)	C	15	E/C		Yes		Yes				Yes		Yes			Yes		Yes	Yes	Yes	Yes		
	Year 4					Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering	Formulate and analyse complex problems to reach substantiated conclusions. This will involve using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed	Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed	Select and critically evaluate technical literature and other sources of information to solve complex problems	Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards	Apply an integrated or systems approach to the solution of complex problems	Evaluate the environmental and societal impact of solutions to complex problems (to include the entire life-cycle of a product or process) and minimise adverse impacts	Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct	Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity	Adopt a holistic and proportionate approach to the mitigation of security risks	Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion	Use practical laboratory and workshop skills to investigate complex problems	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations	Discuss the role of quality management systems and continuous improvement in the context of complex problems	Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights	Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance	Communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used	Plan and record self-learning and development as the foundation for lifelong learning/CPD		



JBM Appendix C Mapping to AHEP4 Learning Outcomes for  
BEng Civil Engineering (Environmental Engineering)

Level	Module code	Module title	Core (C) or Optional (O)	Credit Value	Assessment	Science and Maths	Engineering Analysis				Design and Innovation		The Engineer and Society					Engineering Practice							
						C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18		
Year 1	BE_1601a	Engineering Mathematics and Programming I (15 credits)	C	15	E/C	Yes	Yes	Yes												Yes					
	BE_1601b	Engineering Mathematics and Programming II (15 credits)	C	15	E/C	Yes	Yes	Yes						Yes						Yes					
	BE_1602	Engineering Practice (15 credits)	C	15	E/C		Yes	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes				
	BE_1603a	Engineering Systems and Energy I (15 credits)	C	15	E/C	Yes	Yes	Yes				Yes			Yes					Yes					
	BE_1603b	Engineering Systems and Energy II (15 credits)	C	15	E/C	Yes	Yes	Yes				Yes			Yes					Yes					
	BE1604	Engineering Mechanics - Statics (15 credits)	C	15	E/C	Yes	Yes	Yes							Yes	Yes				Yes					
	BE1605	Engineering Mechanics and Materials I (15 credits)	C	15	E/C	Yes	Yes	Yes							Yes	Yes				Yes					
Year 2	CE16XX	Civil Engineering Principles and Practice (15 credits)	C	15	C	Yes				Yes	Yes	Yes	Yes	Yes			Yes			Yes	Yes	Yes			
	CE_21	Civil Engineering Toolbox & Surveying (15 credits)	C	15	C			Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes		
	CE_22	Reinforced Concrete Design (15 credits)	C	15	E/C		Yes	Yes		Yes	Yes														
	CE_23	Soil Mechanics (15 credits)	C	15	E/C	Yes	Yes	Yes					Yes			Yes	Yes				Yes				
	CE_24	Structural Mechanics 1 (15 credits)	C	15	E/C	Yes	Yes	Yes																	
	CE_25	Structural Mechanics 2 (15 credits)	C	15	E/C	Yes	Yes	Yes									Yes								
	CE_26	Design Project (15 credits)	C	15	C		Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes				Yes	Yes	Yes	Yes	Yes		
	CE_27	Construction Materials & Sustainability (15 credits)	C	15	E/C	Yes				Yes	Yes	Yes	Yes				Yes	Yes							
	CE_28	Fluid Mechanics and Hydraulics (15 credits)	C	15	E/C	Yes	Yes	Yes		Yes							Yes					Yes			
	CE2555	Civil Engineering Placement		120	C		Yes	Yes		Yes	Yes			Yes			Yes	Yes			Yes		Yes		
Year 3	CE_31	Final Year Project (30 credits)	C	30	C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	CE_33	Project Planning, Procurement and Risk (15 credits)	C	15	E/C	Yes	Yes					Yes	Yes	Yes	Yes	Yes		Yes	Yes						
	CE_35	Integrated design project (15 credits)	C	15	C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes		
	CE_37	Resilient Infrastructure and Transport (15 credits)	C	15	E/C		Yes	Yes		Yes	Yes	Yes	Yes	Yes											
	CE_39	Water and Wastewater Infrastructure Design (15 credits)	C	15	E/C	Yes	Yes	Yes		Yes	Yes	Yes	Yes			Yes	Yes				Yes				
	CE_40	Environmental Management and Pollution Control (15 credits)	C	15	E/C	Yes	Yes	Yes		Yes	Yes	Yes	Yes				Yes								
CE_43	Geo-energy Engineering (15 credits)	C	15	E/C	Yes	Yes	Yes		Yes	Yes	Yes	Yes				Yes									

MEng Civil Engineering (Environmental Engineering)

Level	Module code	Module title	Core (C) or Optional (O)	Credit Value	Assessment	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18
Year 4	CE_51	Year-long Group Project (30 credits)	C	30	C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	CE5015	Project Management (15 credits)	C	15	E/C					Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes			
	CE_54	Civil Engineering with Artificial Intelligence (15 credits)	C	15	E/C	Yes	Yes	Yes	Yes					Yes							Yes	Yes	
	CE_58	Water Infrastructure Engineering (15 credits)	C	15	E/C	Yes	Yes	Yes		Yes		Yes			Yes			Yes		Yes	Yes	Yes	
	CE5008	Geo-Environmental Engineering (15 credits)	C	15	E/C		Yes		Yes	Yes		Yes	Yes		Yes	Yes				Yes	Yes	Yes	
	CE_60	Water Process Engineering (15 credits)	C	15	E/C			Yes	Yes	Yes	Yes	Yes		Yes	Yes			Yes		Yes		Yes	
	CE_61	Climate Change and the Environment (15 credits)	C	15	E/C	Yes		Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	Yes	Yes		Yes	
						Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering	Formulate and analyse complex problems to reach substantiated conclusions. This will involve evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed	Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed	Select and critically evaluate technical literature and other sources of information to solve complex problems	Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards	Apply an integrated or systems approach to the solution of complex problems	Evaluate the environmental and societal impact of solutions to complex problems (to include the entire life-cycle of a product or process) and minimise adverse impacts	Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct	Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity	Adopt a holistic and proportionate approach to the mitigation of security risks	Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion	Use practical laboratory and workshop skills to investigate complex problems	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations	Discuss the role of quality management systems and continuous improvement in the context of complex problems	Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights	Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance	Communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used	Plan and record self-learning and development as the foundation for lifelong learning/CPD

**JBM Appendix C Mapping to AHEP4 Learning Outcomes for  
BEng Civil Engineering (Flood and Coastal Engineering)**

BEng Civil Engineering (Flood and Coastal Engineering)																							
Level	Module code	Module title	Core (C) or Optional (O)	Credit Value	Assessment	Science and Maths	Engineering Analysis				Design and Innovation		The Engineer and Society					Engineering Practice					
						C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18
Year 1	BE_1601a	Engineering Mathematics and Programming I (15 credits)	C	15	E/C	Yes	Yes	Yes											Yes				
	BE_1601b	Engineering Mathematics and Programming II (15 credits)	C	15	E/C	Yes	Yes	Yes											Yes				
	BE_1602	Engineering Practice (15 credits)	C	15	E/C		Yes	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes			
	BE_1603a	Engineering Systems and Energy I (15 credits)	C	15	E/C	Yes	Yes	Yes			Yes	Yes	Yes			Yes			Yes	Yes			
	BE_1603b	Engineering Systems and Energy II (15 credits)	C	15	E/C	Yes	Yes	Yes			Yes		Yes			Yes			Yes	Yes			
	BE1604	Engineering Mechanics - Statics (15 credits)	C	15	E/C	Yes	Yes	Yes						Yes		Yes	Yes		Yes	Yes			
	BE1605	Engineering Mechanics and Materials I (15 credits)	C	15	E/C	Yes	Yes	Yes								Yes	Yes		Yes	Yes			
	CE160X	Civil Engineering Principles and Practice (15 credits)	C	15	C	Yes				Yes	Yes	Yes	Yes	Yes				Yes	Yes	Yes			
Year 2	CE_21	Civil Engineering Toolbox & Surveying (15 credits)	C	15	C			Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes			
	CE_22	Reinforced Concrete Design (15 credits)	C	15	E/C		Yes	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	Yes			
	CE_23	Soil Mechanics (15 credits)	C	15	E/C	Yes	Yes	Yes				Yes				Yes	Yes		Yes				
	CE_24	Structural Mechanics 1 (15 credits)	C	15	E/C	Yes	Yes	Yes															
	CE_25	Structural Mechanics 2 (15 credits)	C	15	E/C	Yes	Yes	Yes								Yes							
	CE_26	Design Project (15 credits)	C	15	C		Yes	Yes	Yes	Yes	Yes	Yes			Yes		Yes	Yes	Yes	Yes			
	CE_27	Construction Materials & Sustainability (15 credits)	C	15	E/C	Yes				Yes	Yes	Yes	Yes			Yes	Yes						
	CE_28	Fluid Mechanics and Hydraulics (15 credits)	C	15	E/C	Yes	Yes	Yes		Yes						Yes			Yes				
Year 3	CE2555	Civil Engineering Placement		120	C		Yes	Yes		Yes	Yes		Yes			Yes	Yes		Yes	Yes			
	CE_31	Final Year Project (30 credits)	C	30	C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
	CE_33	Project Planning, Procurement and Risk (15 credits)	C	15	E/C	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes			
	CE_35	Integrated design project (15 credits)	C	15	C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes			
	CE_36	Geotechnical Engineering (15 credits)	C	15	E/C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes		Yes				
	CE_40	Environmental Management and Pollution Control (15 credits)	C	15	E/C	Yes	Yes	Yes	Yes	Yes	Yes	Yes				Yes	Yes						
	CE_41	Flood modelling and analysis (15)	C	15	E/C	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes			Yes						
	CE_42	Flood and coastal infrastructure Design (15)	C	15	E/C					Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes			

**MEng Civil Engineering (Flood and Coastal Engineering)**

MEng Civil Engineering (Flood and Coastal Engineering)						M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18
Year 4	CE_51	Year-long Group Project (30 credits)	C	30	C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	CE_54	Civil Engineering with Artificial Intelligence (15 credits)	C	15	E/C	Yes	Yes	Yes	Yes				Yes	Yes	Yes		Yes	Yes			Yes	Yes	Yes
	CE_61	Climate Change and the Environment (15 credits)	C	15	E/C	Yes		Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	Yes	Yes		Yes	
	CE_62	Advanced Flood and coastal engineering Design (15)	C	15	E/C	Yes	Yes		Yes	Yes	Yes	Yes		Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
	CE_68	Sustainable infrastructure project (15 credits)	C	15	E/C					Yes	Yes	Yes	Yes		Yes	Yes			Yes	Yes	Yes	Yes	Yes
	CE_64	Flood and coastal asset management (15 credits)	C	15	E/C					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	CE_66	Smart and resilient flood and coastal engineering (15)	C	15	E/C	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	
						Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering	Formulate and analyse complex problems to reach substantiated conclusions. This will involve evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques	Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed	Select and critically evaluate technical literature and other sources of information to solve complex problems	Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards	Apply an integrated or systems approach to the solution of complex problems	Evaluate the environmental and societal impact of solutions to complex problems (to include the entire life-cycle of a product or process) and minimise adverse impacts	Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct	Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity	Adopt a holistic and proportionate approach to the mitigation of security risks	Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion	Use practical laboratory and workshop skills to investigate complex problems	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations	Discuss the role of quality management systems and continuous improvement in the context of complex problems	Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights	Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance	Communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used	Plan and record self-learning and development as the foundation for lifelong learning/CPD