Programme Specification Leading to:
BEng (Hons) Civil Engineering (NCUT)

Applicable for all undergraduate students starting in September 2021

Version No.	Date	Notes – QUALITY ASSURANCE USE ONLY	QAM
2021-22 v0.12	*14 September 2021*	*Design Review Panel consider conditions discharged and recommends programme to the College Education Committee. Updates to mapping of programme level learning outcomes*	*JP*
2021-22 v0.2	*14 September 2021*	*Vice Chancellor approves programme on behalf of Senate.*	*JP*
2021-22	*20 September 2021*	*Route code added.*	*JP*

Undergraduate Programme	
1. Awarding institution	Brunel University London (BUL)
2. Teaching institution(s)	Brunel University London (BUL) North China University of Technology (NCUT)
3. Home College / Department / Division	College of Engineering, Design and Physical Sciences / Department of Civil and Environmental Engineering
4. Contributing College / Department	North China University of Technology (NCUT) / Brunel London School, NCUT
5. Programme accredited by	Not accredited
6. Final award(s) and FHEQ Level of Award	BEng (Hons) Civil Engineering (FHEQ level 6)
7. Programme title	BEng Civil Engineering (NCUT)
8. Programme type (Single honours/joint honours)	Single Honours, Double degree programme (BUL and NCUT)
9. Normal length of programme for each mode of study	48 months (full time)
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
14. Other/Intermediate awards and titles and FHEQ Level of Award	CertHE Civil Engineering (FHEQ Level 4) DipHE Civil Engineering (FHEQ Level 5) BEng (Ord) Civil Engineering (FHEQ Level 6)
15. UCAS Code	Not applicable
16. HECoS Code	100148
17. Route Code	3A1EUCENCUT
18. Relevant subject benchmark statements and other external and internal reference points used to inform programme design UK Spec	UK Quality Code for Higher Education QAA Subject Benchmark Statement - Engineering Brunel 2030 The revised fourth edition of the Accreditation of Higher Education Programmes (or AHEP4)

	The BEng (Hons) Civil Engineering (NCUT) programme is not accredited by the UK Engineering Council at present. Further requirements by the UK Engineering Council for an accredited civil engineering degree can be found at: https://www.engc.org.uk/ahep Other useful information: The Framework for Higher Education Qualifications (https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf) Engineering Council: UK-Spec (https://www.engc.org.uk/ukspec) JBM guidance for accreditation, which includes programme design (https://www.jbm.org.uk/Accreditation-guidance) Brunel University London Senate Regulation (https://www.brunel.ac.uk/about/documents/pdf/Senate-Regulation-2-from-2019-2020-03-04.pdf) Brunel's Programme Approval Policy (https://staff.brunel.ac.uk/university-information/policy)
19. Admission Requirements	Details of entry requirements are provided on the University's and College website and on the NCUT website. Levels of English for non-native speakers are defined in terms of the English language component of the Chinese national College entrance examinations. The minimum requirement of English on admission is 100 out of 150 for English language component of the Chinese national College entrance examinations.
20. Other relevant information (e.g. study abroad, additional information on placements)	None
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.	1. For the BEng Honours degree, the student must have achieved an IELTS score of 5.5 (on each component) or above or a Brunel English language test score of 55 or above to progress from FHEQ Level 5 to Level 6. 2. Degree award rules for the BEng Honours degree: 2.1 The student must have achieved an IELTS score of 6.0 (on each component) or above or a Brunel English language test score of 58 or above. 2.2. A student cannot get a Brunel Honours degree if the student fails to meet NCUT's degree requirements. 3. Degree award rule for the BEng Ordinary degree: • 300 credits in total, including at least 100 credits in FHEQ Level 4, 100 in FHEQ Level 5 and 80 credits at FHEQ Level 6.

	3.2 The student must have achieved an IELTS score of 6.0 (on each component) or above or a Brunel English language test score of 58 or above. 3.3 To get a BEng Ordinary degree, a student needs to take all modules specified in the NCUT Chinese degree program specification.
22. Further information about the programme:	http://bls.ncut.edu.cn/index.htm (NCUT) https://www.brunel.ac.uk/study/undergraduate/civil-engineering-beng (BUL)

23. EDUCATIONAL AIMS OF THE PROGRAMME

The aim of the BEng Civil Engineering (NCUT) programme is to produce graduates who possess a sound knowledge and understanding of civil engineering subjects and their application in the modern world. Upon successful completion of the programme, students will receive two separate degree certificates, one from BUL and one from North China University of Technology (NCUT) in Beijing, China.

Graduates from the programme will be capable of addressing the needs of society and business; 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. Those outcomes will be achieved by including a range of specialist taught modules in the programme and also by drawing on the internationally-renowned research expertise in both partner universities.

BUL and NCUT will work closely to provide students with a supportive and intellectually stimulating learning environment. Part of Year 0 will be delivered at NCUT, the rest of the programme will be delivered by BUL. Delivery of the programme will be split between BUL and NCUT as follows:

- Year 0, NCUT modules will be delivered together with two BUL modular blocks (MA1601 and MA1602)
- Year 1 (FHEQ Level 4), the BUL BEng Civil Engineering programme curriculum will be delivered.
- Year 2 (FHEQ Level 5), the BUL BEng Civil Engineering programme curriculum will be delivered.
- Year 3 (FHEQ Level 6), the BUL BEng Civil Engineering programme curriculum will be delivered

The unique dual delivery approach will provide opportunities to enhance student appreciation of engineering as an international professional activity. Modules in Year 0 will provide Chinese students with the skills needed to succeed on a UK higher education programme that is delivered in English. Years 1 and Year 2 will focus on providing the students with fundamental knowledge in core engineering subjects. Design projects in Years 2 and 3 will provide students with opportunities to demonstrate the novel international dimension of the programme, engaging them in the practical application of their knowledge and skills to solve complex international engineering challenges.

24. PROGRAMME AND INTERMEDIATE LEARNING OUTCOMES

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

Year and FHEQ level	Category (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)	Learning Outcome Group	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.	BE1601a, BE1601b, BE1603a, BE1603b, BE1604, BE1605
	C	**C2-1: Problem analysis**	Assess problems to reach sound conclusions using first principles of mathematics, statistics, natural science and engineering principles.	BE1603a, BE1603b, BE1604, BE1605
	C	**C3-1: Analytical tools and technics**	Apply appropriate computational and analytical techniques to model problems.	BE1603a, BE1603b, BE1604, BE1605
	K,C,S	**C5-1: Design**	Design solutions for engineering and other problems, with consideration of a range of societal, environmental and professional factors.	BE1602, CE16xx
	K,C	**C6-1: Integrated/systems approach**	Apply an integrated or systems approach to the solution of an engineering problem.	CE1602 CE16xx
	K	**C7-1: Sustainability**	Describe the environmental and societal context of solutions to complex engineering problems and minimise adverse impacts.	BE1602, BE1603a, BE1603b, CE16xx
	C, S	**C8-1: Ethics**	Identify ethical concerns in an engineering context.	BE1602, CE16xx
	K	**C9-1: Risk**	Explain the basic principles of risk management in an engineering context.	BE1601b, CE16xx
	K	**C10-1: Security**	Describe the nature of security risks in an engineering context.	BE1602, CE16xx
	C,S	**C12-1: Practical and workshop skills**	Effectively report on the use of practical laboratory and workshop skills to assess engineering problems.	BE1603a, BE1603b, BE1604, BE1605.
	K,S	**C13-1: Materials, equipment,**	Describe appropriate materials, equipment, engineering technologies and processes.	BE1604, BE1605, CE16xx

		technologies and processes		
	S	**C16-1: Teamwork**	Demonstrate an understanding of how they function as an individual, and as a member of a team.	BE1602
	S	**C17-1: Communication**	Communicate effectively on engineering matters.	BE1601a, BE1601b, BE1602, BE1603a, BE1603b, BE1604, BE1605, CE16xx
	S	**C18-1: Lifelong learning**	Effectively record and reflect on self-learning and development.	BE1602 CE16xx
Year 2 and FHEQ Level 5				
	K,C	**C1-2: Science, mathematics and engineering principles**	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	**C2-2: Problem analysis**	Describe and explain 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
	K,C	**C3-2: Analytical tools and technics**	Select and apply appropriate computational and analytical techniques to model engineering problems, recognising the limitations of the techniques employed.	CE_22, CE_23, CE_24, CE_25, CE_26, CE_28
	K,C	**C4-2: Technical literature**	Select and use technical literature and other sources of information to address complex civil engineering problems	CE_21, CE_26
	C,S	**C5-2: Design**	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 matters, codes of practice and industry standards.	CE_21, CE_22, CE_26, CE_27
	K,C	**C6-2: Integrated/systems approach**	Apply an integrated or systems approach to the solution of civil engineering problems.	CE_22, CE_26, CE_27
	K,C	**C7-2: Sustainability**	Discuss 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	**C8-2: Ethics**	Identify and describe ethical concerns and make reasoned ethical choices informed by professional codes of conduct.	CE_21, CE_26
	C	**C9-2: Risk**	Use a risk management process to identify, risks (the effects of uncertainty) associated	CE_26

			with a particular project or activity and propose appropriate mitigations.	
	K,C	**C10-2: Security**	Describe and explain the nature of security risks and appropriate mitigation in a civil engineering context.	CE_21
	K,C	**C11-2: Equality, diversity and inclusion**	Demonstrate 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	**C12-2: Practical and workshop skills**	Use practical laboratory and workshop skills to investigate civil engineering problems.	CE_21, CE_23, CE_24, CE_28
	K,S	**C13-2: Materials, equipment, technologies and processes**	Select and assess appropriate materials, equipment, engineering technologies and processes.	CE_21, CE_23, CE_27
	C	**C14-2: Quality management**	Discuss the role of quality management systems and continuous improvement in the context of civil engineering problems.	CE_21
	K,C	**C15-2: Engineering and project management**	Describe and explain engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.	CE_26
	C,S	**C16-2: Teamwork**	Reflect effectively on their performance as an individual, and as a member or leader of a team.	CE_21, CE_26
	S	**C17-2: Communication**	Communicate effectively on civil engineering matters with technical and non-technical audiences.	CE_21, CE_26
	C,S	**C18-2: Lifelong learning**	Plan and record self-learning and development as the foundation for lifelong learning/CPD.	CE_21, CE_26
Year 3 and FHEQ Level 6				
	K,C	**C1-3: Science, mathematics and engineering principles**	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_34, CE_36
	K,C	**C2-3: Problem analysis**	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	**C3-3: Analytical tools and technics**	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	**C4-3: Technical literature**	Select and evaluate technical literature and other sources of information to address complex civil engineering problems.	CE_31, CE_35

	K,C	**C5-3: Design**	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_37
	C	**C6-3: Integrated/systems approach**	Apply an integrated or systems approach to the solution of complex problems.	CE_31, CE_32, CE_34, CE_35, CE_36, CE_37.
	K,C	**C7-3: Sustainability**	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	**C8-3: Ethics**	Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.	CE_31, CE_33, CE_35
	C	**C9-3: Risk**	Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.	CE_31, CE_33, CE_35
	C	**C10-3: Security**	Adopt a holistic and proportionate approach to the mitigation of security risks.	CE_31, CE_33, CE_35,
	C,S	**C11-3: Equality, diversity and inclusion**	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	**C12-3: Practical and workshop skills**	Use and evaluate practical laboratory and workshop skills to investigate complex problems.	CE_34, CE_36
	K,C	**C13-3: Materials, equipment, technologies and processes**	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.	CE_35, CE_36
	K,C	**C14-3: Quality management**	Discuss the role of quality management systems and continuous improvement in the context of complex civil engineering problems.	CE_31, CE_33
	K,C	**C15-3: Engineering and project management**	Apply 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	**C16-3: Teamwork**	Critically reflect on their performance as an individual, and as a member or leader of a team.	CE_31, CE_35
	C,S	**C17-3: Communication**	Communicate effectively on complex civil engineering matters with technical and non-technical audiences.	CE_31, CE_35
	C,S	**C18-3: Lifelong learning**	Plan, record and evaluate self-learning and development as the foundation for lifelong learning/CPD.	CE_31, CE_35

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

In Year 0, students will undertake two English language modules, MA1601 (English for academic purposes), and MA1602 (English for communication scientific purposes). This will ensure that students develop the English language skills needed to successfully complete higher levels of the programme. Students will also be provided with guidance and support that is designed to enable their successful transition from the Chinese to the UK teaching and learning system. A series of formative assessments will be used to help students develop effective study routines and skills in independent learning. A group exercise will be used to build skills in team working and critical reflective analysis.

Years 1 and 2 (FHEQ Level 4&5) will provide students with fundamental knowledge of core engineering subjects (e.g. engineering mathematics, structural mechanics, construction materials science, hydraulics etc.). To facilitate learning, a wide range of teaching methods will be used, including: lectures, tutorials, and laboratory practicals. Students will be introduced to industry-relevant software tools and will start the process of developing skills through the practical use of the software when solving engineering problems. Field trips will allow students to witness how engineering projects are designed and implemented. 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. English language skills training will continue, to ensure that, by the end of Year 2, students are able to achieve an IELTS score of 5.5 or above (in each component of the test), or a Brunel English Language score of 55 or above (in each component of the test).

Year 3 (FHEQ Level 6), will continue the strategy of using mixed teaching and learning techniques, and assessment methods. Students will deepen their knowledge and understanding of 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. This year will 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. In Year 3, students will continue to develop their English Language skills and must achieve an IELTS score of 6.0 or above (in each component) or a Brunel English language test of 58 or above (in each component).

An Industrial Advisory Board (IAB), will monitor the teaching and learning strategy developed by BUL and NCUT. The IAB will ensure that the programme includes content relevant to industry and that graduates from the programme emerge with the knowledge and skills needed to succeed in a professional engineering career.

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 also ensures that most learning outcome is assessed at least once at each level of the programme.

As a general strategy, teaching blocks 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 civil engineering toolbox and surveying module and the group design project in Year 2, the dissertation and integrated design project in Year 3.

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.

Year 0 – English Language Tuition

Compulsory modular block codes, titles and credits

MA1601 English for Academic Purposes (0 credits)
MA1602 English for Communication Scientific Purposes (0 credits)

Other modular blocks led and delivered by NCUT are shown in appendix document entitled "*NCUT led Year 0 CE modules*". They all carry 0 credits.

Year 1 (FHEQ Level 4)	
Compulsory modular block codes, titles and credits BE1603a Engineering Systems and Energy I (15 credits) BE1603b Engineering Systems and Energy II (15 credits) BE1604 Engineering Mechanics - Statics (15 credits) BE1605 Engineering Mechanics and Materials I (15 credits) MA2601 Intensive English Training I (0 credits) MA2602 Intensive English Training II (0 credits) **Core assessment modular blocks:** BE1601a Engineering Mathematics and Programming I (15 credits) BE1601b Engineering Mathematics and Programming II (15 credits) BE1602 Engineering Practice (15 credits) CE16XX Civil Engineering Principles and Practice (15 credits)	**Optional modular block codes, titles and credits**
Level 4 Progression and Award Requirements **As per Senate Regulation 2**	

Year 2 (FHEQ 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_21 Civil Engineering Toolbox & Surveying (15 credits) CE_22 Reinforced Concrete Design (15 credits) CE_23 Soil Mechanics (15 credits) CE_24 Mechanics of Materials (15 credits) CE_25 Structural Mechanics (15 credits) CE_27 Construction Materials & Sustainability (15 credits) CE_28 Fluid Mechanics and Hydraulics (15 credits) **Core assessment modular blocks:** CE_26 Design Project (15 credits)	**Optional modular block codes, titles and credits** Construction Management (NCUT 3 credits, similar to a standard BUL 15-credit module)
Level 5 Progression and Award Requirements **As per Senate Regulation 2** To progress from Level 5 to Level 6 (FHEQ), students must achieve an IELTS score of 5.5 or above (in each component), or a Brunel English Language score of 55 or above (in each component).	

Year 3 (FHEQ 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_32 Design of Steel and Timber Structures (15 credits) CE_33 Project Planning, Procurement and Risk (15 credits) CE_34 Computational Structural Analysis (15 credits) CE_36 Geotechnical Engineering (15 credits) CE_37 Resilient Infrastructure and Transport (15 credits) **Core assessment modular blocks:** CE_31 Final Year Project (30 credits) CE_35 Integrated design project (15 credits)	**Optional modular block codes, titles and credits** BIM and Construction Management (NCUT 4 credits, similar to a standard BUL 15-credit module)

Level 6 Progression and Award Requirements

As per Senate Regulation 2

To Graduate, students must achieve an IELTS score of 6.0 or above (in each component) or a Brunel English language test of 58 or above (in each component).

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.