

### **PROGRAMME SPECIFICATION**

Part 1: Information	
Awarding Institution	UWE
Teaching Institution	UWE
Delivery Location	Frenchay Campus
Study abroad / Exchange / Credit recognition	N/A
Faculty responsible for programme	Faculty of Environment and Technology
Department responsible for programme	Geography and Environmental Management
Professional Statutory or Regulatory Body Links	Accreditation from The Joint Board of Moderators (JBM) comprising: The Institution of Civil Engineers, The Institution of Structural Engineers, The Chartered Institution of Highways and Transportation and The Institute of Highway Engineers is being sought
Highest Award Title	MSc Civil Engineering
Default Award Title	
Interim Award Titles	PG Diploma Civil Engineering PG Certificate Civil Engineering
UWE Progression Route	
Mode of Delivery	FT / PT
ISIS code/s	H20H12
For implementation from	September 2018

### Part 2: Description

The aim of the Faculty's MSc programme in Civil Engineering is to respond to the need for effective engineering and infrastructure practitioners by offering programmes that are an intellectually challenging consisting of a mixture of taught engineering science and experiential learning. The practitioner's approach is intended to produce engineers with a strong orientation towards problem solving, underpinned by theoretical knowledge.

The MSc Civil Engineering programme is a postgraduate course which aims at educating Engineering Professionals with the necessary in-depth scientific and technical knowledge in the broad field of Civil Engineering. The programme is intended to provide students with firm technical bases while nurturing decision-making and leadership potential. It prepares graduates to practice their profession at an advanced level and with a unique exposure to the international environment to better understand global issues of Civil Engineering.

This MSc programme is distinguished by a greater emphasis upon critical appraisal of existing ideas and practice, original thought and creative ability.

The educational aims of the faculty's taught postgraduate programmes are:

- to provide an intellectual experience of advanced study, underpinned by staff expertise, research and experience;
- to enable the student to further and deepen his/her knowledge, understanding and analytical abilities in a stimulating and challenging academic environment;
- to prepare the student for further professional development in his/her chosen field;
- to offer postgraduate opportunities for part-time students in employment.

The MSc Civil Engineering programme aims to:

- Provide students with an enhanced base of knowledge and current and reflective practice necessary to further develop their career in Civil Engineering as a Professional Engineer aiming for Chartered Engineer registration with the Engineering Council.
- Enhance specialist knowledge in selected areas of Civil Engineering which build upon studies at the undergraduate level.
- Further develop skills of independent learning and critical appraisal.
- Develop a broader insight into aspects of Civil Engineering design.
- Develop critical insight into broader management issues relating to Civil Engineering in particular and construction in general.
- Provide the opportunity to progress to the next level of study as appropriate.

### Programme requirements for the purposes of the Higher Education Achievement Record (HEAR)

This programme offers students the opportunity to study aspects of infrastructure with modern techniques where candidates experience a wide variety of civil engineering sub-disciplines. The MSc structure creates highly skilled and technical competent engineers able to plan, design and analyse infrastructure with modern technologies, applying innovative techniques used in industry. The programme structure provides students with (i) Understanding of civil engineering principles at the forefront of sector, (ii) Analysis of civil engineering methods, materials, technologies and processes and (iii) Awareness of civil engineering in a real-world context using laboratory techniques, experimental design and field trips.

### Regulations

A: Approved to University Regulations and Procedures

# Part 3: Learning Outcomes of the Programme

A. Knowledge, Awareness and Understanding	Learning and Teaching (Knowledge and Understanding)
A1. Selected specialist areas of Civil Engineering to an advanced level.	<ul> <li>Acquisition of A1 and A2 is gained through formal lectures, guest lecturers from industry, small group seminars and computer laboratory exercises.</li> </ul>
A2. Further broadening aspects of Civil Engineering design.	<ul> <li>Knowledge of A3 is gained specifically through the Non-linear Structural Analysis and Advanced Soil Mechanics modules and is further reinforced in other postgraduate modules, assignments and coursework</li> </ul>
A3. Generic quantitative modelling relevant to Civil Engineering problems.	<ul> <li>Acquisition of A4 is through the Masters Project module and project work and assignments.</li> </ul>
A4. Techniques applicable to specific research and advanced scholarship.	<ul> <li>Acquisition of A5 is through the Project Management Principles and BIM in Design Coordination modules and further reinforced in most other courses where relevant.</li> </ul>
A5. Engineering management issues and decision making relating to Civil Engineering and construction.	<ul> <li>Acquisition of A6 is from Advanced Water and Wastewater Engineering Design, and specifically through the transport infrastructure engineering module.</li> </ul>
A6. The global and social responsibilities of engineers and the environmental impact of their activity.	<ul> <li>Assessment (Knowledge and Understanding)</li> <li>Assessment of A1 and A2 is through unseen time constrained assignments, and open ended case studies and assignments.</li> <li>Assessment of A3 is through hands-on computer laboratory work, assignments and project work.</li> <li>Assessment of A4 is through dissertation and assignments.</li> <li>Assessment of A5 is through unseen examinations, case studies and assignments.</li> <li>Assessment of A6 is through case studies and assignments.</li> </ul>
B. Intellectual Skills and Know-how	Learning and Teaching (Intellectual skills)
B1. Systematic understanding of general and specialist Civil Engineering knowledge.	<ul> <li>Acquisition of B1, B2, B3 and B4 is through the provision of</li> </ul>

<ul> <li>intellectually challenging problems in all courses along with seminar support.</li> <li>Acquisition of B5, B6 and B7 is through assignments and case studies in all modules and specifically through the Masters Project.</li> <li>Assessment (Intellectual skills)</li> <li>Assessment of B1, B2, B3 and B4 is through unseen examinations, other time constrained individual assignments, case studies and openended assignments.</li> <li>Assessment of B5, B6 and B7 is through project work, case studies and assignments</li> </ul>
Learning and Teaching (Subject practical skills)
<ul> <li>Acquisition of C1 is developed through computer laboratory work,</li> </ul>
<ul> <li>case studies, assignments and individual and group projects.</li> <li>Acquisition of C2 is through case studies, laboratory work and design projects.</li> <li>Acquisition of C3 and C4 is mainly though the Masters project and the</li> </ul>
assignments of most modules.
<ul> <li>Acquisition of C5 is through presentations of assignments and case studies included in several modules.</li> <li>Learning skills for the acquisition of C6 and C7 are explicit throughout</li> </ul>
the programme and specifically in the Masters Project.
<ul> <li>Assessment (Subject practical skills)</li> <li>Assessment of C1 and C2 through unseen examinations, laboratory</li> </ul>
<ul> <li>Assessment of C3, and C4 mainly through the Individual Project</li> <li>Assessment of C5 through presentations and project reports</li> <li>Assessment of C6, C7 assignments and the Individual Project</li> </ul>
Learning and Teaching (Transferable/key skills)

D1. Apply a conceptual engineering approach to the solution of complex problems.	<ul> <li>Acquisition of D1, D2 and D3 is through solving problems and carrying out practical activities in the majority of modules throughout the</li> </ul>
D2 Make decisions in complex and unpredictable situations	<ul> <li>programme.</li> <li>Acquisition of D4 is mainly through the Project Management Principles module and other optional BIM modules in the programme.</li> </ul>
D3 Use creativity and innovation in problem solving.	<ul> <li>D5 is implicit in many modules and specifically Non-Linear Structural</li> </ul>
D4 Make management decisions at the strategic and operational levels.	<ul> <li>Analysis and Advanced Soil Mechanics modules.</li> <li>Acquisition of D6 is primarily through the Masters project and other project based coursework including group projects.</li> </ul>
D5 Use computing and Information Technology Tools in the solution of Civil Engineering problems.	<ul> <li>Acquisition of D7 is through assignments, the Masters Project and.</li> </ul>
	Assessment (Transferable/key skills)
D6 Exercise initiative and personal responsibility.	<ul> <li>Assessment of D1, D2 and D3 is through coursework and assignments and project work.</li> </ul>
D7 Develop independent learning skills required for continuing professional development.	<ul> <li>Assessment of D4 and D5 is included as an element of most assessment methods.</li> <li>D6 is assessed though assignments and Masters Project</li> </ul>
	<ul> <li>Assessment of D7 is through project reports and presentations.</li> </ul>

All modules are core. No optional modules	sMRK-60-M Masters Project	sMTA-15-M Advanced Soil hanics	sMUA-15-M Non Linear Structural lysis	BMSR-15-M Advanced Construction erials and Technology	sMTR-15-M Bridge Engineering	sMUR-15-1 Advanced Water and te Water Engineering Design	M7A-15-M Project Management ciples	MGW-15-M BIM in Design rdination	GMFX-15-M Transport rastructure Engineering
Learning Outcomes:	UBGM	UBGM <sup>-</sup> Mechai	UBGMI Analysi	UBGM: Materia	UBGM	UBGMI Waste	UBLM7 Princip	UBLMC Coordii	UBGN Infras
A) Knowledge, Awareness and understanding of:									
A1	X	X	Х	X	Х	X	Х	X	Х
A2	Х	Х	Х	Х	Х	Х	Х	Х	Х

A3		Х	Х			Х			Х
A4	Х	Х	Х	Х	Х				Х
A5							Х	X	
A6	X			Х	-	X		X	Х
(B) Intellectual Skills									
B1	Х	Х	Х	Х	Х	Х	Х	Х	Х
B2	Х	Х	Х	Х	Х	Х	Х	Х	Х
B3	Х	Х	Х	Х	Х	Х	Х	X	Х
B4	Х	Х	Х	Х	Х	Х	Х	Х	Х
B5	Х	Х	Х	Х	Х	Х	Х	Х	Х
B6	Х	Х	Х	Х	Х	Х	Х	Х	Х
B7	X	X	X	Х	X	X	Х	X	Х
(C)									
Subject/Professional/Practi									
Engineering Problems									
C1	Х	Х	X	Х	Х	X	Х	X	X
C2	X	Х	X		X	X			Х
C3	Х		Х	Х	Х	X	Х	Х	
C4	X	Х	X	Х	Х	X	Х	X	X
C5	X					X			
C6	X	Х	X	Х	Х	X	Х	X	X
C7	X	X	X	X	X	X	X	X	X
(D) Transferable skills,			-						
Know-How and other									
attributes					.,				····,
D1	X	X	X	Х	Х	X	Х	X	X
D2	Х	X	Х	Х	Х	Х	Х	X	Х
D3	Х	X	X	Х	Х	Х	Х	X	Х
D4							Х	Х	
D5		Х	Х						
D6	Х			Х		Х	Х		Х
D7	X	Х	X	Х	Х	X	Х	X	Х

Mapping to Accr Learning outcom	editationes for	on of H UK St	ligher andar	Educa d for P	ation F Profess	Prograr sional l	nmes Engin	(AHEI eering	P),
Competence							•	•	
All modules are core. No optional modules	BGMRK-60-M Masters roject	BGMTA-15-M Advanced oil Mechanics	BGMUA-15-M Non Linear tructural Analysis	BGMSR-15-M Advanced onstruction Materials and echnology	BGMTR-15-M Bridge ngineering	BHMUR-15-1 Advanced ater and Waste Water ngineering Design	BLM7A-15-M Project anagement Principles	BLMGW-15-M BIM in esign Coordination	BGMFX-15-M Transport frastructure Engineering
Science and Mathematics		DŎ	_⊃ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	JOF		⊃≤ū	ΞΣ	50	<u> </u>
(SM)									
SM1m	Х	Х	X	Х	Х	Х			Х
SM2m						Х		-	
SM3m	X			Х	Х	X	Х	X	
SM4m	X	Х	X	Х	Х	X	Х	X	Х
SM5m		Х	X		Х	X			Х
SM6m							Х	X	
(II) Engineering Analysis (EA)					~	~~~~			~~~~
	X	X	X	X	X	X			X
		X	X		v	v			X
	v	X		X	X	X	v	v	X
		^	^	^	× v		^ V		~ V
	^	v	v	v	× v	N V	~ V		~ V
EA0III		^	^	^	^	^	^	^	^
(III) Design (D)									
D1					Х	Х			
D2	Х	Х	Х	Х	Х	Х	Х	Х	Х
D3m	Х	Х	X	Х	Х	Х		Х	Х
D4		Х	X	Х	Х	Х		Х	Х
D5					Х	X			Х

D6	X								
D7m	Х	Х	Х	Х	Х	Х			Х
D8m	X		Х	Х	Х	Х			Х
(IV) Economic, Legal, Social,									
Ethical and Environmental									
Context (EL)									
EL1m	X								
EL2					Х	Х	Х	Х	Х
EL3m							Х	X	
EL4	X	Х	Х	X	X	X	Х	X	Х
EL5m	X						Х	Х	
EL6m	X	Х	Х	X	Х	Х			Х
EL7m							X		
(V) Engineering Practice (P)									
P1	X	Х	Х	Х	Х	Х			Х
P2m	X	Х	Х	Х	Х	Х			
P3	X	Х	Х	Х	Х	Х			Х
P4	X	Х	Х	Х	Х	Х	Х	Х	Х
P5							Х		
P6		Х	Х	Х	Х	Х			Х
P7						Х	Х	Х	
P8	X	Х	Х	Х	Х	Х			Х
P9m	Х	Х	Х	Х	Х	Х	Х	Х	Х
P10m	Х	Х	Х	Х	Х	Х			Х
P11m							Х	Х	
(VI) Additional General Skills (G)									
G1	X	Х	Х	Х	Х	X	Х	Х	Х
G2	Х				Х				Х
G3m	X								
G4	X								Х

This structure diagram demonstrates the student journey from Entry through to Graduation for a typical **full time postgraduate student** including:

- level and credit requirements
- interim award requirements
- module diet, including compulsory and optional modules

ENTRY		Compulsor	v Modules	Awards
		Masters Project UBGMRK-60-M Students can choose to study Masters Project UBGMRK-60-M in Year 1 or Year 2	,	PG Cert Civil Engineering Minimum 60 credits.
		Advanced Soil Mechanics UBGMTA-15-M Non linear Structural		PG Diploma Civil Engineering Minimum 120 credits excluding the Masters
		Analysis UBGMUA-15-M		Project
	Level M	Materials and Technology UBGMSR-15-M		
		UBGMTR-15-M Advanced Water and Wastewater Engineering		Highest award: MSc Civil Engineering (180 M level credits)
		UBGMUR-15-M Project Management Principles		
		UBLM7A-15-M BIM in Design Coordination UBLMGW-15-M		
		Transport Infrastructure Engineering		
		UBGMFX-15-M		

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# Part time:

The following structure diagram demonstrates the student journey from Entry through to Graduation for a typical **part time student**.

ENTRY		Compulsor	y Modules	Awards
		Masters Project UBGMRK-60-M		PG Cert Civil Engineering Minimum 60 credits.
	Σ	Advanced Soil Mechanics UBGMTA-15-M		PG Diploma Civil
	ar 1 Level I	Non linear Structural Analysis UBGMUA-15-M		Minimum 120 credits excluding the Masters Project
	Υе	Advanced Construction Materials and Technology UBGMSR-15-M		
		Bridge Engineering UBGMTR-15-M		

	Compulsor	y Modules	Awards
	Masters Project UBGMRK-60-M		
	Students can choose to study Masters Project UBGMRK-60-M in Year 1 or Year 2		
evel M	Project Management Principles UBLM7A-15-M		Highest award: MSc Civil Engineering (180 M level credits)
Year 2 L	Advanced Water and Wastewater Engineering UBGMUR-15-M		
	BIM in Design Coordination Module code UBLMGW-15-M		
	Transport Infrastructure Engineering Module code UBGMFX-15-M		

#### Part 5: Entry Requirements

We normally require a honours degree at 2:2 or above in Civil Engineering or a related discipline.

We can consider applicants who do not meet the normal entry requirement, but who do have relevant

professional experience or qualifications. In your application, you should describe in detail your

professional experience and qualifications.

Students educated in a language other than English should have an IELTS score of 6.5 or above with no skill less than 5.5.

Entry requirements are available through the courses database.

### Part 6: Reference Points and Benchmarks

This programme has been prepared and designed with reference to a number of external benchmarks and reference points. These include:

- (i) QAA Subject Benchmark Statement for Engineering
- (ii) QAA Framework for HE Qualifications
- (iii) The Engineering Council's Accreditation of Higher Education Programmes-UK Standard for Professional Engineering Competence (Third Edition)
- (iv) The Joint Board of Moderators 2017 Guidelines for Developing Degree Programmes
- (v) Civil Engineering Industrial Advisory Board (IAB)
- (vi) University's Learning and Teaching Strategy and Strategy 2020

The QAA Framework for HE Qualifications defines a programme at Masters level as: "at, or informed by, the forefront of an academic or professional discipline. Students will have shown originality in the application of knowledge, and they will understand how the boundaries of knowledge are advanced through research. They will be able to deal with complex issues both systematically and creatively, and they will show originality in tackling and solving problems".

The Subject Benchmark Statement for Engineering outlines a set of skills expected of a graduate in an engineering discipline (Section 4 of the Statement refers), while noting that they should be interpreted in the context of the particular engineering discipline which is being studied. These skills map closely to many of the skills contained in the learning outcomes for the proposed programme of study. The MSc in Civil Engineering has been designed to enhance and develop these skills to postgraduate level. In particular this programme requires students to demonstrate skills at a postgraduate level relating to the specification, management and solution of engineering problems. There is also considerable emphasis on the analysis and design of engineering solutions at postgraduate level, and the ability to research and critically evaluate alternative proposals. Consequently, we believe that the MSc award will build on and enhance the skills in the Subject Benchmark Statement for Engineering.

The Engineering Council is a signatory to the Washington and Sydney Accords, which provide a mechanism for mutual recognition by signatory countries of accreditation processes and, by extension, of accredited degrees for CEng and IEng degrees respectively. From the Engineering Council's Accreditation of Higher Education Programmes-UK Standard for Professional Engineering Competence (Third Edition), Masters degrees accredited for further learning varies in nature and purpose. This Masters degree offers the chance to study in greater depth particular aspects and applications of a broader civil engineering in which graduates hold an honours degree at Bachelor's level in Civil Engineering. The Masters programme provides an opportunity to integrate both technical and non-technical aspects of civil engineering and to develop a commitment to professional bodies, social responsibilities and ethical codes. The weighting given to the six broad areas (Science and Mathematics, Engineering Analysis, Design, Economic, legal, social, ethical and environmental context, Engineering practice, and Additional general skills) as identified from the Engineering Council's Accreditation of Higher Education Programmes-UK Standard for Professional Engineering Council's Accreditation as provides as accredited as Further professional Engineering Council's Accreditation of Higher Education Programmes-UK Standard for Professional Engineering Council's Accreditation of Higher Education Programmes-UK Standard for Professional Engineering Council's Accreditation of Higher Education Programmes-UK Standard for Professional Engineering Council's Accreditation of Higher Education Programmes-UK Standard for Professional Engineering Council's Accreditation of Higher Education Programmes-UK Standard for Professional Engineering Council's Accreditation of Higher Education Programmes-UK Standard for Professional Engineering Council's Accreditation of Higher Education Programmes-UK Standard for Professional Engineering Council's Accreditation for Master

#### Part 6: Reference Points and Benchmarks

Learning to Masters level, fully meeting the educational requirements for CEng are well embedded into all modules for the programme structure.

From the Joint Board of Moderators 2017 Guidelines for Developing Degree Programmes the MSc programme adheres to the JBM core list of modules/subjects from List A (structures, materials and geotechnics) as well as includes both compulsory and optional modules from List B (Environmental Engineering, public health, transport infrastructure engineering and construction management). Additionally, the programme includes the AHEP learning outcomes (Awareness, Knowledge, Understanding, Know-how, Skills and Complex-engineering problems) which are met in all modules.

The Civil and Environmental Engineering cluster maintains a strong, visible and viable link with the civil engineering profession through an active Industrial Advisory Board (IAB). The IAB is chaired by Clive Onions who is a senior engineering consultant with wide ranging industrial expertise. Members of the IAB come from different industrial disciplines that include Local Authority, Environment agency, Water company, structural engineering firm and the Institution of Civil Engineers. The IAB members have been involved in the design process stages of the MSc programme and strongly support it.

#### References

- I. Engineering Council (EC) Accreditation of Higher Education Programmes UK Standard for Professional Engineering Competence, Third Edition. Available online at: <u>http://www.engc.org.uk/EngCDocuments/Internet/Website/Accreditation%20of%20Higher%20Educ</u> <u>ation%20Programmes%20third%20edition%20(1).pdf</u>
- II. Joint Board of Moderators (JBM) (2017) Guidelines for Developing Degree Programmes January 2018 (Version1-Revision 2). Available online at: http://jbm.org.uk/uploads/JBM117degreeguidelines\_jan18.pdf
- III. The Quality Assurance Agency for Higher Education (QAA). (2014) UK Quality Code for Higher Education Part A: Setting and Maintaining Academic Standards, The Framework for Higher Education Qualifications for UK Degree-Awarding Bodies, October 2014. Available Online at: http://www.gaa.ac.uk/en/Publications/Documents/gualifications-frameworks.pdf
- IV. The Quality Assurance Agency for Higher Education (QAA). (2015) QAA Subject Benchmark Statement Engineering (February 2015). Available online at: <u>http://www.qaa.ac.uk/en/Publications/Documents/SBS-engineering-15.pdf</u>

### FOR OFFICE USE ONLY

First CAP Approval Date		20 March 2018						
Revision CAP Approval Date			Version	1	Link to Business Case, PAMI (ID 4659)			
Next Periodic Curriculum Review due date								
Date of last Periodic Curriculum Review								