

**ACADEMIC SERVICES**

**PROGRAMME SPECIFICATION**

<b>Part 1: Basic Data</b>		
<b>Awarding Institution</b>	University of the West of England	
<b>Teaching Institution</b>	University of the West of England	
<b>Delivery Location</b>	Frenchay campus, University of the West of England	
<b>Faculty responsible for programme</b>	Environment and Technology	
<b>Department responsible for programme</b>	Architecture and the Built Environment	
<b>Modular Scheme Title</b>	FET Postgraduate Modular Scheme	
<b>Professional Statutory or Regulatory Body Links</b> <i>Name of PSRB</i> <i>Type of approval</i> <b>Dates</b>	Royal Institution of Chartered Surveyors (RICS)	
<b>Highest Award Title</b>	MSc BIM in Design, Construction, and Operation	
<b>Default Award Title</b>		
<b>Interim Award Titles</b>	PG Cert BIM in Design, Construction and Operation PG Dip BIM in Design, Construction and Operation	
<b>UWE Progression Route</b>		
<b>Mode(s) of Delivery</b>	Full time or part time	
<b>Codes</b>	<b>UCAS:</b>	<b>JACS:</b>
	<b>ISIS2: K21012</b> K21012	<b>HESA:</b>
<b>Relevant QAA Subject Benchmark Statements</b>	QAA Masters Degree Characteristics 2010	
<b>CAP Approval Date</b>	July 2015	
<b>Valid From</b>	September 2015	
<b>Valid until Date</b>		
<b>Version</b>	1.2	

**Part 2: Educational Aims of the Programme**

The MSc BIM in Design, Construction, and Operation programme is a one year full time postgraduate master's programme.

The postgraduate programme seeks to provide graduates and professionals with knowledge and skills to pursue a career in the emerging field of Building Information Modelling (BIM). The inter-professional and multi-disciplinary ethos of the Department of Architecture and the Built Environment sets the context for the MSc BIM in Design, Construction, and Operation. The programme draws on the department's research in

**Part 2: Educational Aims of the Programme**

construction, property, ICT and sustainability. The programme fosters advanced understanding of the wider managerial, professional, technological, legal and sustainable context within which BIM operates, as well as the organisation of the construction industry and its inter-professional nature.

Knowledge and skills developed by the programme are as follows:

1. provide advanced understanding of how BIM affects design, construction and operation;
2. shed light on the complexity of working in interdisciplinary teams and managing collaborative design, construction and operation;
3. provide advanced skills in developing building information models to simulate design, construction, and operation;
4. use advanced BIM approach to deliver low carbon building;
5. ability to generate complex BIM proposals showing understanding of current and emerging trends, originality in the application of subject knowledge and, where appropriate, to test new hypotheses and speculations.

**Part 3: Learning Outcomes of the Programme**

The award route provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

Learning Outcomes	Teaching, Learning and Assessment Strategies
<b>A Knowledge and Understanding</b>	
<p>A Knowledge and understanding of</p> <ol style="list-style-type: none"> <li>1) Emerging practice in Building Information Modelling (BIM), some of which is at or related to the forefront of built environment disciplines.</li> <li>2) Role of BIM in designing, building, managing, and maintaining the built environment.</li> <li>3) BIM enabled interdisciplinary and collaborative practices.</li> <li>4) Role of BIM to deliver the sustainability agenda.</li> </ol>	<p>Teaching/learning methods and strategies:</p> <p>The central learning experience of the programme is the BIM project, which is focussed around a series of integrative projects. Some of this learning experience is complemented by student-led research.</p> <p>BIM projects are supplemented by the taught components, delivered through lectures, seminars, and case studies. The teaching and learning process also includes the examination of the legal implications of BIM information production and sharing.</p> <p>BIM projects are key vehicles for the deepening understanding of BIM enabled interdisciplinary working and integration between professions.</p> <p>The evaluation of building environmental performance is delivered through the low impact building module. However, sustainability issues are embedded in all modules, and delivered through BIM projects, as well lectures and seminars.</p>
<p>Assessment:</p>	

<b>Part 3: Learning Outcomes of the Programme</b>	
	Testing of acquired knowledge is through BIM projects, focused on various aspects of built environment lifecycle (i.e. design, construction, operation, and maintenance). It also include assessment of written and coursework work, and verbal presentations.
<b>B Intellectual Skills</b>	
B Intellectual Skills	Teaching/learning methods and strategies:
1) Ability to solve problems in collaboration with members of other disciplines and expertise, and devise alternative solutions to planning, designing and generating a shared BIM model.	The teaching/learning experience consists of a series of BIM projects addressing defined clients' briefs that address a range of complex problems, pertaining to functional, aesthetic, cost, technical and environmental issues. Projects are designed to integrate technical, cost, management and environmental knowledge.
2) Ability to critically analyse and evaluate decisions pertaining to the design, construction or operation of a built environment.	The skill of critical analysis is at the core of various modules, and fully merged in the integrated BIM project. The intellectual skills considered range from costing, environmental, technical, and legal issues.
3) Ability to use key BIM software proficiently.	
4) Apply BIM knowledge and understanding to various situations and contexts.	
	Assessment:
	Testing of these intellectual skills is through structured seminars, reports, essays, project presentations and BIM projects.
<b>C Subject, Professional and Practical Skills</b>	
C Subject, Professional and Practical Skills	Teaching/learning methods and strategies:
1) Ability to develop a BIM execution plan that caters for the needs of clients and users.	Deliver a BIM execution plan, as part of a team, to respond to the clients' brief and expectations.
2) Ability to produce BIM models that demonstrate an emphasis on a collaborative approach to the design, construction, and operation of the built environment.	Produce, as part of a team, BIM models focused on various aspects of building lifecycle.
3) Ability to produce BIM models that fully consider sustainable built environments.	Generate a BIM shared model to design, build and operate a low carbon built environment.
4) Ability to reflect on the legal and the cost-benefit implications of co-design, co-production, co-sharing, and archiving of BIM information.	Examine the legal and cost-benefit implications of BIM information at various stages of built environment lifecycle.
	Assessment:
	The integration of technical, legal and environmental knowledge is tested in BIM project work, including specific presentations and written submissions.

**Part 3: Learning Outcomes of the Programme**

**D Transferable Skills and other attributes**

D Transferable Skills and other attributes

1 Ability to communicate to both technical and lay audiences strategies that may include the planning, production, organisation, and structure of a shared BIM project, through the use of a variety of media.

2 Ability to work collaboratively with other students and members of other professions and disciplines in a spirit of trust and honesty.

3 Ability to deal with complex issues both systematically and creatively, make sound judgments in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences

4 Demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level

5 Continue to advance knowledge and understanding, developing new skills to a high level.

Teaching/learning methods and strategies:

The development of communication skills is an important part of BIM learning. Students are required to make visual written and verbal presentations geared to the needs of a variety of audiences using a range of media, which might include digital models, text, verbal presentations and may also include multimedia presentations, computer simulations, and other presentational techniques.

Team working skills are developed through BIM projects. Students will be given opportunities to engage with professionals in other disciplines.

Assessment:

Testing of team working and presentation skills is an integral part of BIM project assessment.

#### Part 4: Programme Structure

This structure diagram demonstrates the student journey from Entry through to Graduation for a **full time student**, including: level and credit requirements, interim award requirements, module diet, including compulsory and optional modules

Full time	Compulsory Modules	Optional Modules	Interim Awards
<b>ENTRY</b>	UBLMGW-15-M BIM in Design Coordination  UBLMCJ-15-M Construction Contract Law  UBLMM4-30-M BIM in Business and Practice  UBLM79-15-M Construction Project Management Practice  UBLMHF-15-M BIM in Construction Operations  UBLMMK15-M BIM in Operation and Maintenance  UBLMQ4-15-M Low/Zero Impact Buildings  UBLLY7-60-M Masters Dissertation		<b>PG Cert BIM in Design,            Construction and            Operation</b> 60 Credits  <b>PG Dip BIM in Design,            Construction and            Operation</b> 120 Credits not including the Dissertation  <b>MSc. BIM in Design,            Construction and            Operation</b> 180 credits (including Dissertation)

### MSc BIM in Design, Construction and Operation [Part Time]

<b>Part time</b>		<b>Compulsory Modules</b>	<b>Optional Modules</b>	<b>Interim Awards</b>
<b>ENTRY</b>	Year 1.1	UBLMGW-15-M Building Information Management in Design Coordination  UBLMCJ-15-M Construction Contract Law  UBLM79-15-M Construction Project Management Practice  UBLMM4-30-M BIM in business and practice		<b>PG Cert BIM in Design, Construction and Operation</b> 60 Credits
	Year 1.2	<b>Compulsory Modules</b>  UBLMHF-15-M BIM in Construction Operations  UBLMMK-15-M BIM in Operation and Maintenance  UBLMQ4-15-M Low/Zero Impact Buildings	<b>Optional Modules</b>	<b>Interim Awards</b>  <b>PG Dip BIM in Design, Construction and Operation</b> 120 Credits not including the Dissertation
		<b>Compulsory Modules</b>  UBLLY7-60-M Masters Dissertation	<b>Optional Modules</b>	<b>MSc. BIM in Design, Construction and Operation</b> 180 credits (including Dissertation)
<b>January intakes: Same part-time structure as above apart from students take UBLMHF-15-M BIM in Construction Operations in 1.1 and UBLMM4-30-M BIM in Business and Practice in 1.2.</b>				
<b>GRADUATION</b>				

#### Part 5: Entry Requirements

The University's Standard Entry Requirements apply with the following additions:  
 Entry to the MSc BIM in Design, Construction and Operation Programme award will be available to students who are:

Graduates of an Honours degree at grade 2:2 or above in a relevant built environment discipline. Applicants with an Honours degree at grade 2:2 or above in a non-built environment discipline, with a relevant experience in the construction environment may be considered, depending on background and experience. The programme also welcomes applications from non-graduates with relevant experience

## Part 5: Entry Requirements

and an appropriate professional qualification. Equivalent accredited international qualifications are acceptable. International applicants must have English to IELTS 6.5 or equivalent.

## Part 6: Assessment

A: Approved to University Regulations and Procedures

### Assessment Map

The programme encompasses a range of **assessment methods** including; submission of portfolios, essays, illustrated reports, presentations using a range of media and written examinations). These are detailed in the following assessment map:

#### Assessment Map for MSc BIM in Design, Construction and Operation

		Type of Assessment*									
		Unseen Written Exam	Open Book Written Exam	In-class Written Test	Practical Exam	Practical Skills Assessment	Oral assessment and/or presentation	Written Assignment	Report / Project	Dissertation	
Compulsory Modules Level M	UBLMMK-15-M <b>BIM in Design Coordination</b>					A (50)			B (50)		
	UBLMCJ-15-M <b>Construction Contract Law</b>						A (30)		B (70)		
	UBLMM4-30-M <b>BIM in business and practice</b>						A (50)		B (50)		
	UBLM79-15-M <b>Construction Project Management Practice</b>						A (50)		B (50)		
	UBLMHF-15-M <b>BIM in Construction Operations</b>					A (50)			B (50)		
	UBLMGW-15-M <b>BIM in Operation and Maintenance</b>					A (50)			B (50)		
	UBLMQ4-15-M <b>Low/Zero Impact Buildings</b>					A (50)			B (50)		
	UBLLY7-60-M <b>Masters Dissertation</b>									100	

\*Assessment should be shown in terms of Written Exams, Practical exams, or Coursework as indicated by the colour coding above.

## Part 7: Student Learning

### Teaching, learning and assessment strategies to enable learning outcomes to be achieved and demonstrated

The MSc BIM in Design, Construction and Operation Programme contains a series of specialist subject modules, where the student is encouraged to study BIM related topics in depth,

The teaching is a mix of *scheduled and independent learning*.

**Scheduled learning** includes lectures, seminars, tutorials, project supervision, demonstration and workshops; field courses and other external visits; supervised time in BIM workshops.

**Independent learning** includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc.

### Description of Distinctive Features and Support

7.1 The inter-professional and multi-disciplinary approach and expertise at the Faculty of Environment and Technology sets the unique context for the programme. Unlike other existing postgraduate programmes in BIM, which tend to focus on specific aspects of information management such as design or sustainability, the proposed programme is more holistic in its approach and seeks to deal with the whole built environment lifecycle, including design, construction, operation, maintenance, and sustainability. This unique programme emphasises innovative sustainable and collaborative practices in building information modelling and management, within an integrated approach. This makes this postgraduate programme more distinctive, and offers more employment opportunities for UWE graduates.

7.2 The fact that the programme is offered in a flexible manner (full-time or part time) facilitates part-time learning and provides opportunities to change the pattern of attendance during the course, making it attractive to large cohort of students, who currently work in practice or professionally and wish to study part-time.

7.3 Opportunities for international recruitment

Since BIM was introduced in the Architecture, Engineering and Construction (AEC) industry, it has gone from being a buzzword with a handful of early adopters to a worldwide focus of AEC technology. Most of the world's leading architecture, engineering, and construction firms have already adopted BIM for nearly all of their projects. The majority of SMEs worldwide are considering their transitions from CAD to BIM. In short, BIM is now at the forefront of professional and research interest worldwide. Consequently, there are significant opportunities to recruit international students.

7.4 Professional validation

Not applicable.

## Part 8: Reference Points and Benchmarks

### 8.1 Professional Context

Building Information Modelling (BIM) is emerging as the industry standard approach to the modelling and management of building lifecycle; from design and construction to maintenance, and demolition. The Government's Construction Strategy has pushed forward the programme for adopting BIM, as all public funded projects must meet the BIM protocol. The Government has stipulated that BIM will become compulsory on publicly procured projects from 2016. Consequently, future bidders on public building projects would be required to use BIM, and this trend is likely to affect also privately procured building projects. BIM is expected to become a major enabler for greater productivity, and to deliver reduced cost and risk within the construction industry. Above all, it will help the industry to meet its obligations for a



## Part 8: Reference Points and Benchmarks

low-carbon future. However, lack of education, skills and professionals are cited amongst the major obstacles for the adoption of BIM as a collaborative platform in the industry. The PGc/PGd, MSc. Building Design and Information Management seeks to respond to this challenge and opportunity. It offers education and skills in BIM to critically engaged design, construction and built environment professionals.

### 8.2 The Requirements of Professional Bodies

Not applicable.

### 8.3 The research interests of the Faculty

The subject focus of BIM are closely related to the established and emerging research interests of the faculty. The construction and property research centre (CPRC) has a proven track record of research expertise and attracting research funding in BIM. For instance:

Title: The Virtual Construction Site: A decision Support System for Construction Planning Source: EPSRC – Principal Investigator GR/N00906/01 (P) In conjunction with University College London (UCL), UMIST, Teeside University and over 20 Industrial collaborators.

Title: Simulating the Performance of Hybrid Concrete Structures Using Virtual Prototyping Techniques Source: EPSRC – Investigator GR/R53623/

Title: ICT Builders for SME Survival. Source: European Social Funding.

### 8.4 QAA descriptors

The programme has been designed with reference to the QAA Masters descriptors 2010 which benchmarks the structure and learning outcomes for masters programmes.

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical 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 of individual modules can be found in module specifications, available on the University's website.