MODULE SPECIFICATION

Part 1: Information			
Module Title	Building Physics and Services		
Module Code	UBLMSB-30-1	Level	Level 4
For implementation from	2018-19		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Environment & Technology	Field	Architecture and the Built Environment
Department	FET Dept of Architecture & Built Environ		
Contributes towards	Architecture and Environmental Engineering [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19 Building Services Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19 Architectural Technology and Design [Sep][FT][Frenchay][3yrs] BSc (Hons) 2018-19 Architecture and Environmental Engineering [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19 Architecture and Environmental Engineering [Sep][SW][Frenchay][8yrs] - Not Running MDes 2017-18 Architectural Technology and Design [Sep][SW][Frenchay][4yrs] BSc (Hons) 2018-19 Building Services Engineering {Apprenticeship} [Sep][PT][Frenchay][5yrs] BEng (Hons) 2018-19 Building Services Engineering {Top-Up} [Sep][PT][SHAPE][1.5yrs] BEng (Hons) 2018-19 Building Services Engineering {Top-Up} [Sep][FT][SHAPE][1yr] BEng (Hons) 2018-19		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Educational Aims: In addition to Learning Outcomes, the educational experience may explore, develop, and practise but not formally discretely assess the following:

The development of science related study skills and analytic thinking.

The broadening of information literacy with an introduction to a wide range of information types and sources

Outline Syllabus: The following list is indicative of the subject areas chosen. These may vary slightly to meet Programme needs or changes to contemporary practice and are necessarily given equal weighting in study or assessment time.

Element 1 – Internal Environments, Science and Sustainability: the historical context; health and wellbeing in buildings; vernacular environments; air quality; the role of material science; the climate change context; the resource depletion context; the energy security context.

Element 2 – Human Thermal Comfort and Thermal Performance of Structures: thermal comfort; microclimates; heat loss in buildings; thermal insulation; air-tightness; casual and solar heat gains; thermal mass; passive cooling techniques; natural ventilation; condensation.

Element 3 – Mechanical Heating, Ventilation and Air Conditioning: space heating systems; mechanical ventilation; comfort cooling; humidity control; heat pumps; heat recovery, community heating.

Element 4 – Water and Public Health Systems: mains water distribution; hot water systems; solar thermal systems; waste water systems; greywater recovery; rainwater harvesting; sustainable urban drainage.

Element 5 – Life Safety and Fire Engineering: lessons from previous fires; assessing fire risk; smoke performance in buildings; fire detection and alarms; sprinklers; suppression systems; smoke related ventilation systems; fire wall related services – shutters, dampers, fire-stopping, fire proofing; hazardous areas; gas detection; support services for emergency responders.

Element 6 – Acoustics and Noise Control: fundamentals of acoustics; the ear; room acoustics; transmission of sound through materials; speech intelligibility and public address systems.

Element 7 – Visual Comfort and Lighting: fundamentals of light and colour; workings of the eye; daylight in buildings; lamp technologies; luminaire geometry; lighting layouts; lighting control; lighting applications; emergency lighting; way-finding.

Element 8 – Electrical Power and Communications: electricity; electrical distribution; micro-generation; motors; power quality; IT networks; server rooms; wireless systems; lightning protection.

Element 9 – Movement, Transport and Security in Buildings: flow analysis of portals, route-ways and stairs; lifts; escalators and moving walkways; passive security design; access control; intruder detection; CCTV.

Element 10 – Energy in the Built Environment: fuels; energy efficiency; carbon indexing; energy conservation, controls and BMS

Teaching and Learning Methods: Total Contact Hours are 300 hours comprising:

Scheduled Learning

Lectures: 33 hours

Tutorials / Seminars: 33 hours

Field Work / External Visits: 6 hours

Total: 72 hours

Independent Learning:

Summative Assessment: Coursework: 42 hours

Summative Assessment: Exam revision / preparation: 42 hours

Directed Learning: 96 hours

Self-Directed Learning 48 hours

Total Independent Learning: 228 hours

A recommended weekly plan for student study is as follows:

Preparation for lecture/tutorial time: 1 hour

Contact time: 3 hours

Directed study: 4 hours

Self-directed learning: 2 hours

For directed study students should carry out the learning activities given to them in each element, covering topics from lectures and essential reading sources. For self-directed study, students should study aspects of the topics they find most interesting, recording their findings in a structured and coherent set of course notes.

Students should divide the 60 hours of revision for assessment between each component depending on that components weighting. Assessment will usually take place outside of teaching time, but in the event of a component being assessed in a teaching week, students are expected to undertake revision in addition to their normal
study time.

Each element of syllabus will involve an introduction of the topics through lecture, when students will receive an explanation of the context of the subject and an indication of the depth to which they are expected to study it.

Topics will then be explored further in practical lab-based activities and tours of campus facilities.

Students will be supported in their study with on-line resources including publications, websites, video clips and blackboard resources. Finally students will be supported in tutorials to analysis environments and solve related problems as required in assessments.

Part 3: Assessment

On-line assessments will be used to widen the range of questions asked, to provide students with a fixable approach to answering mathematical aspects of the course and to increase the speed of returning marks and feedback. Coursework is used to encourage student participation, while developing analytical thinking skills and technical report writing. The examination is used to concentrate students' attention on assimilating the factual and conceptual content of the module.

Summative Assessment

Component B1 (25% of total)
Students will complete an on-line test that will require them to perform calculations associated with the topics and to demonstrate their understanding by answering short answer questions.

Component B2 – Coursework (25% of total) – 2000 words
Students are required to submit a technical report describing the aspects of the space from an environmental physics perspective and identify how the space is being serviced by mechanical and electrical systems.

Component A – End of Year Exam – 3 hours (50% of total marks)
Section A1 – Seen Question – students will be expected to write a short essay on a topic that requires them to discuss the relationship between building physics, health and sustainability.

Section A2 – Multiple Choice – students will be assessed on their ability to identify a wide range of items associated with building physics and services, based on what they look like and what function they perform. Students will also be required to identify which aspects of building services have the greatest impact on a building's carbon footprint.

Component A3 – Short Answer Questions – students will be assessed on their ability to state the scientific theories that underlie how buildings influence internal environments and how services contribute to this.

Formative Feedback
Formative feedback will be given with mock in-class tests using electronic voting, peer review and tutor feedback in tutorials.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		25 %	Coursework, 2000 words
Online Assignment - Component B		25 %	Semester 1 on-line test
Examination - Component A	✓	50 %	Exam
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		25 %	Coursework, 2000 words
Online Assignment - Component B		25 %	On-line test
Examination - Component A	✓	50 %	Exam

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will be able to:

	Module Learning Outcomes
MO1	Explain the processes by which buildings have typically interacted with their physical environment and how that might differ in a sustainable context
MO2	Identify the primary components of mechanical, electrical and public health building services
MO3	Identify the aspects of environmental physics and building services that impact a building's carbon footprint
MO4	Explain the purpose and operation of simple Building Services Systems
MO5	Perform the fundamental calculations associated with thermal comfort, heat balance, heating, cooling and ventilation in buildings, indicating the relevance of the results
MO6	Write a technical report on the process of measuring the physical parameters associated with human comfort, explaining their contribution to health, well-being and sustainability and the role of building services

Contact Hours

Contact Hours	
Independent Study Hours:	
Independent study/self-guided study	228
Total Independent Study Hours:	228
Scheduled Learning and Teaching Hours:	
Face-to-face learning	72
Total Scheduled Learning and Teaching Hours:	72
Hours to be allocated	300
Allocated Hours	300

Reading List

The reading list for this module can be accessed via the following link:

https://uwe.rl.talis.com/modules/ublmsb-30-1.html