MODULE SPECIFICATION

Part 1: Information			
Module Title	Energy Conservation in the Built Environment		
Module Code	UBLMMU-30-2	Level	Level 5
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			
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	Building Physics and Services 2018-19		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Educational Aims: This module aims to teach students the basics of energy conservation in the built environment – buildings and transport – giving students a solid technical basis for the management and policy aspects explored in other modules.

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

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

Outline Syllabus: 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 – Transport:
National transport policy and climate change; vehicle technology; potential for modal shift to walking, cycling and public transport; behaviour change; transport and spatial planning; aviation and shipping; freight and logistics.

Element 5 – 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 6 – Electrical Power and Communications:
Electricity; electrical distribution; micro-generation; motors; power quality; IT networks; server rooms; wireless systems; lightning protection.

Element 7 – Boilers and Hot Water:
Combustion; stoichiometry; flue gas analysis; condensing boilers; combi-boilers; water cylinders; solar thermal; hot water distribution losses.

Element 8 – Controls – Building Management System:
Open and closed loop control; time switches; occupancy sensors; temperature, daylight, humidity and CO2 sensors; interlocks; control strategies.

Note: all elements are not weighted equally in study or assessment time

Teaching and Learning Methods: Contact time including site visits: 72 hours

Assimilation and development of knowledge: 148 hours

Exam preparation: 40 hours

Coursework preparation: 40 hours

Total study time: 300 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.

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 issues and solve related problems as required in assessments.

Part 3: Assessment

Summative Assessment
The examination is used to concentrate students' attention on assimilating the factual and conceptual content of the module.

Component A
Exam will contain short answer question to test general knowledge of the subject and apply problem solving skills to typical energy conservation scenarios in the built environment.

Component B
Coursework is used to improve technical report writing while analysing the practical implications of energy conservation in different systems associated with the built environment. Every element of the module will contain a directed piece of coursework that students will be expected to undertake. A selection of this work will then be submitted for assessment.

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**
Portfolio - Component B		50 %	Portfolio (3000 words)
Examination - Component A	✓	50 %	Examination
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Portfolio - Component B		50 %	Portfolio (3000 words)
Examination - Component A	✓	50 %	Examination

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 aspects of environmental physics and building services that impact a building's carbon footprint
MO3	Explain the purpose and operation of simple Building Services Systems
MO4	Explain the main elements of UK Government policy on transport and climate change, and the main challenges involved in meeting national targets
MO5	Discuss the potential for energy and carbon reductions in transport from technological, behavioural and structural policy options
MO6	Perform the fundamental calculations associated with thermal comfort, heat balance, heating, cooling and ventilation in buildings, indicating the relevance of the results

	MO7	Write a technical assessment of the energy conservation possibilities associated with the built environment

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/index.html