MODULE SPECIFICATION

Part 1: Information			
Module Title	Energy Transformations		
Module Code	UBLMH8-15-2	Level	Level 5
For implementation from	2019-20		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Architecture and the Built Environment
Department	FET Dept of Architecture & Built Environ		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Educational Aims: See Learning Outcomes

Outline Syllabus: This is an indicative list of what the syllabus will contain. Subjects will not necessarily be taught in this order nor be of equal weighting:

Fuels and combustion: combustion principles, burner technology and control, fuel storage and handling; sustainable fuels – biofuels and energy from waste; anaerobic digestion; pyrolysis and fuel modification processes;

Boilerhouse practice and system design: hot water and steam generation; plant management and operation; boiler testing and rating; flue gas analysis; emissions control and dispersion; flue and chimney design;

Grid electricity: coal; gas; nuclear; hydro; wind; wave; tide; solar farms; electricity wholesale markets;

On-site electricity generation and storage: diesel generators; battery systems; uninterruptable power supplies; microgeneration; combined heat and power; tri-generation; fuel cells and hydrogen cycles;

Solar energy: solar data and geometry, estimation of solar irradiance, active thermal solar collectors, photo-voltaic energy systems; building integrated PV;

Wind power: atmospheric physics, Weibull distribution; turbines; power density, efficiency and load factor.

Teaching and Learning Methods: Scheduled learning Lectures are to introduce topics, define the scope of learning required and provide initial conceptual development. Lectures are followed in the subsequent week by supervised tutorial/seminar sessions to reinforce cognitive development and provide feedback. Supervised tutorials provide guidance in applying quantitative methods required for solving problems, and provide feedback on independent learning and activities undertaken in support of the planned site visits.

Independent learning Directed independent learning in this module includes time engaged with essential reading, completion of tutorial exercise drills, preparation for and subsequent analysis of laboratory investigations, preparation for, and completion of, summative assignment. Time spent on independent learning should be in the order of 4-5 hours per week.

Hours
Lectures tutorials and field work: 36
Assimilation and development of knowledge: 74
Exam preparation: 20
Report preparation: 20
Total study time: 150

Part 3: Assessment

The Strategy:

Given the high level of technical content, a report of a technical analysis of system performance is an appropriate assessment as it requires a wide range of application skills and writing skills, demonstrating the learning outcomes have been achieved.

As a controlled component, an examination has precedent in motivating student engagement and demonstrating the achievement of the learning outcomes.

The Assessment:

Examination of 2 hours duration – 'unseen' questions relating to topics from across the module content.

Coursework assignment – nominal word budget 1,500 words, but taking account of the likely inclusion of graphical, quantitative and computer-generated outputs. The assignment will require the reporting of specified aspects pertaining to the site visits.

Formative feedback and preparation for Component A will be undertaken in the programme of scheduled tutorials.

A formative assignment for component B will be based on one of two site visits, and the summative assessment based on the second.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		50 %	Technical Report 1500 words
Examination - Component A	✓	50 %	Examination (2 hours)

Resit Components	Final Assessment	Element weighting	Description
Report - Component B		50 %	Technical Report 1500 words
Examination - Component A	✓	50 %	Examination (2 hours)

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	Reference
Explain principles of engineering plant and systems involving the production, generation, and conversion of energy.	MO1
Quantitatively analyse energy systems to evaluate inputs/outputs, efficiencies, life-cycle costing, carbon intensity and associated performance criteria	MO2
Explain statutory requirements, codes of practice and operational norms relating to the design, installation and management of energy generation and conversion plant	MO3
Observe and record technical details of energy conversion systems and equipment, and report findings graphically and in writing	MO4
Plan and execute test procedures to establish plant operation characteristics, record and analyse data, and report results using appropriate forms	MO5

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	114
Total Independent Study Hours:	114
Scheduled Learning and Teaching Hours:	
Face-to-face learning	36
Total Scheduled Learning and Teaching Hours:	36
Hours to be allocated	150
Allocated Hours	150

Reading List

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

https://uwe.rl.talis.com/modules/ublmh8-15-2.html

Part 5: Contributes Towards
This module contributes towards the following programmes of study: Building Services Engineering [Sep][FT][Frenchay][3yrs] BEng (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