



Module Specification

Energy Performance and Retrofit

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Part 1: Information

Module title: Energy Performance and Retrofit

Module code: UBLL7U-15-3

Level: Level 6

For implementation from: 2027-28

UWE credit rating: 15

ECTS credit rating: 7.5

College: College of Arts, Technology and Environment

School: CATE School of Architecture and Environment

Partner institutions: None

Field: Architecture and the Built Environment

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: Yes

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module covers energy management in buildings, focusing on industry structure, energy regulations, and market dynamics. Students will learn data gathering and analysis techniques, including energy audits and benchmarking. The retrofit of energy improvements to existing buildings will be explored, emphasising energy efficiency, renewable integration, and the challenges of retrofitting. Performance evaluation will involve technical and financial analysis of building systems, promoting energy-efficient behaviour and sustainable practices.

Features: Not applicable

Educational aims: The educational aim of this module is to equip students with the skills to critically assess energy-related projects, representing stakeholders, preparing feasibility reports, conducting post-occupancy evaluations, and presenting findings while integrating technical, regulatory, and economic considerations. An element of enterprise will be achieved through engagement with international case studies as part of the learning.

Outline syllabus: This module covers essential aspects of energy management and analysis within the industry. Students will explore the structure of the energy supply industry, including energy-use regulations, certification schemes, and incentive programs. The role of energy in facility management, energy markets, and tariffs will also be addressed, offering a broad view of the industry's operations.

The module will also focus on data gathering and analysis techniques, such as energy audits, monitoring and instrumentation, metering, and sub-metering. Students will learn how to use systems like EBMS, conduct surveys, apply CUSUM analysis, create Sankey diagrams, and benchmark energy usage.

A key section of the module will focus on the retrofit of energy improvements to existing buildings. Students will examine strategies to improve energy efficiency in older buildings, including insulation upgrades, efficient HVAC systems, and the integration of renewable energy technologies. They will also study the challenges of retrofitting, including financial constraints, regulatory requirements, and the impact of building design.

Students will then engage in performance evaluation, analysing both technical and financial aspects energy demand.

As part of a strategy to highlight enterprise activities in the curriculum, an element on inter-nationalisation shall be achieved through engagement of case studies developed from UK, Hong Kong and Oman versions of similar past assessments. Enterprise shall also be demonstrated through method of proposing feasibility on innovative idea.

In this module the following competencies are met and assessed to passing standard appropriate to this level of study:

Understand the consequences of design decision making on value to clients and communities over the life-cycle of built projects and the costs to the environment.

Understand the implications and benefits of regenerative design solutions and ethical sourcing and supply chains throughout the life cycle of architectural projects that meet or go beyond minimum standards.

Understand the implications and benefits of working with existing buildings including potential for re-use and retrofit, and the resulting environmental impact.

Work with clients and other stakeholders to gain a mutual understanding of constraints and opportunities, identify immediate and long-term interests, set project agendas, define desirable and feasible project outcomes, and develop appropriate briefs for projects.

Locate, evaluate and apply relevant legislation, regulations, standards, codes of practice and policies related to the development of the built environment.

Locate and evaluate evidence that may be incomplete or contradictory, critically evaluating the quality of knowledge sources, making judgements and drawing appropriate conclusions that can inform architectural practice.

Understand how modelling and post occupancy evaluation inform design

Part 3: Teaching and learning methods

Teaching and learning methods: Teaching Strategy for the Module

The subject is taught through a structured and diverse set of activities designed to enhance student understanding and engagement. The strategy includes the following components:

Introductory Lectures - A comprehensive set of lectures provides a foundational

overview of the subject, establishing key concepts and objectives. These session serves as a starting point for deeper exploration through subsequent activities.

Interactive Tutorial - Tutorials are designed to foster engagement by encouraging questions, discussions, and problem-solving. These sessions allow students to clarify concepts and apply their knowledge in a collaborative setting.

Computer based tutorials - regular taught sessions use engineering software in Technology Enhanced Learning rooms, combining individual tasks and group work to analyse system parameters, interpret data, and present meaningful outputs in a collaborative environment.

Online Learning Resources - A rich suite of online learning materials supports students in their independent study. These resources include multimedia content, readings, interactive tools, and self-assessment opportunities, enabling students to learn at their own pace and in the manner that suits their individual preferences.

This multi-faceted teaching strategy ensures a well-rounded learning experience, combining theoretical understanding, practical application, and independent exploration to meet diverse learning needs.

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

MO1 Prepare a feasibility report for an energy related project in an existing building, accounting for energy generation/efficiency projections, technology assessment, regulation compliance, qualification for incentive schemes, lifecycle costs and user acceptability.

MO2 Undertake a post-occupancy evaluation – covering the areas of functionality, comfort and energy – using recognised procedures, related computer software and field data collected using a range of measurement and audit techniques

MO3 Defend a feasibility study of a retrofit measure to a professional and critical audience, evaluating the risks and opportunities.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://rl.talis.com/3/uwe/lists/52B012F8-36DC-091E-0859-1F83B31E44AB.html?lang=en-GB&login=1) via the following link <https://rl.talis.com/3/uwe/lists/52B012F8-36DC-091E-0859-1F83B31E44AB.html?lang=en-GB&login=1>

Part 4: Assessment

Assessment strategy: Assessment Strategy

The assessment strategy for this module is designed to evaluate students' understanding of energy management practices, technical feasibility, and the ability to communicate complex ideas clearly. It provides opportunities to demonstrate both written and oral communication skills while reinforcing technical and analytical abilities. Being a live module which involves engagement with industry professionals, two assessments are required to ensure students are prepared for their presentation to an acting client.

First Attempt Assessment

Task 1 – Report

Students will submit a comprehensive written feasibility report for an energy project, and undertaking a post-occupancy evaluation. This task will assess the students' ability to analyse and synthesise information and apply relevant methodologies.

Task 2 – Presentation

Students will prepare and deliver a presentation on the feasibility study to a critical audience. The presentation will require students to defend their methodology, evaluate risks and opportunities, and present their findings clearly and concisely. Preparation for this assessment will include enhanced study skills support as part of the scaffolding for inclusive assessment, helping students to gain confidence with presenting work to an audience, which will also feature in future modules. Alternative

assessment types for students with approved reasonable adjustments may be considered, but shall retain an element in-person presentation.

Second Attempt Assessment

Task 1 – Report

Students will submit a report to the same brief as the first attempt.

Task 2 – Presentation

Students will undertake a presentation to a similar brief as the first attempt.

Feedback Strategy

Formative feedback will be provided on the initial drafts of the report and presentation. Written feedback will guide improvements, focusing on clarity, the strength of argumentation, methodology, and overall communication. This feedback will enable students to enhance both their academic writing and presentation skills, promoting continuous improvement.

Assessment tasks:

Written Assignment (First Sit)

Description: Report (2,500 words)

Weighting: 75 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2

Presentation (First Sit)

Description: Presentation (10 minutes)

Weighting: 25 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO3

Written Assignment (Resit)

Description: Report (2,500 words)

Weighting: 75 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2

Presentation (Resit)

Description: Presentation (10 minutes)

Weighting: 25 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Architecture and Environmental Engineering [Frenchay] BEng (Hons) 2025-26