



Module Specification

Sustainability and Energy Simulations

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Part 1: Information

Module title: Sustainability and Energy Simulations

Module code: UBLLYF-15-2

Level: Level 5

For implementation from: 2021-22

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Architecture & Built Environ

Partner institutions: None

Delivery locations: Frenchay Campus

Field: Architecture and the Built Environment

Module type: Standard

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Not applicable

Features: Not applicable

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:

Thermal Simulation of Buildings and Services

Introduction to computational fluid dynamics (CFD); dynamic behaviour of materials, space heating, thermal mass; fluid flow, heat transfer and heat exchange; thermal modelling of buildings and artificial lighting

Energy Modelling

Energy benchmarking; CO2 emissions; compliance software

Strategic Sustainable Design

Sustainability rating systems (BREEAM; LEED)

Part 3: Teaching and learning methods

Teaching and learning methods: Scheduled learning Each topic 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 using proprietary software and data from monitoring and metering instruments.

Independent learning Students will be supported in their study with on-line resources including publications, websites, and blackboard resources.

Hours:

Contact time: 36

Assimilation and development of knowledge: 74

Exam preparation: 20

Coursework preparation: 20

Total study time: 150

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

MO1 Assess the thermal response of buildings under dynamic conditions and estimate the impact on thermal comfort of potential design alternatives

MO2 Perform simulations of building services performance and fluid flows

MO3 Assess a buildings energy and carbon footprint using methods approved for regulation compliance

MO4 Identify the risks and opportunities associated with using rating systems designed to quantify sustainability

MO5 Define the computational tasks associated with quantifying sustainable use of energy, water, materials, light and sound

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ubllfy-15-2.html) via the following link <https://uwe.rl.talis.com/modules/ubllfy-15-2.html>

Part 4: Assessment

Assessment strategy: Strategy:

Given the high level of computer simulation on this module, an assessment brief must be flexible enough to allow for learners to achieve the learning outcomes in a manner that best suits their wide variety of learning styles. A portfolio allows for informal feedback over the course of the module and allows for a range of tasks that ensures students are focused on turning their learning into a meaningful output.

The Assessment:

A: Sustainability, Energy Analysis and Modelling Portfolio (3,000 words).

The Sustainability, Energy Analysis and Modelling reports require the students to

demonstrate, throughout the academic year, that they can perform the analytic modelling procedures introduced in the lectures, as well as analyse wider sustainability and energy aspects of the module. Tutored workshops support the necessary learning.

Assessment components:**Portfolio - Component A (First Sit)**

Description: Sustainability, Energy Analysis and Modelling Portfolio (3000 words)

Weighting: 100 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Portfolio - Component A (Resit)

Description: Sustainability, Energy Analysis and Modelling Portfolio (3000 words)

Weighting: 100 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Building Services Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2020-21

Building Services Engineering {Apprenticeship-UWE} [Sep][FT][Frenchay][5yrs]
BEng (Hons) 2019-20