Module Specification

Low Carbon Structures

Version: 2023-24, v3.0, 05 Jul 2023

Contents

Part 1: Information

Module title: Low Carbon Structures

Module code: UBLLWH-30-1

Level: Level 4

For implementation from: 2023-24

UWE credit rating: 30

ECTS credit rating: 15

Faculty: Faculty of Environment & Technology

Department: FET Dept of Architecture & Built Environ

Partner institutions: None

Field: Architecture and the Built Environment

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module introduces the principles of construction, building assembly and structures to first year architecture students. It appraises these from the perspective of low energy design, introducing the first principles of building assembly, concepts of environmental design and circular economy that students may integrate into their design practice.

Features: The module presents a broad range of construction topics and synthesises aspects of this knowledge in a discrete design project that invites the students to apply this learning on a small-scale single storey building.

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

Working as a member of a group and meeting obligations to others within the module cohort.

The use of learning resources in support of practical tests, including the use of technical resources and information in support of design decision-making.

Professional habits of work, time-keeping and punctuality.

Outline syllabus: This module introduces an investigative approach to construction theory, material selection and building evaluation. The purpose of the module is to understand how buildings are constructed, why they are constructed in a particular way and from what. This is achieved by exploring the following key technical principles:

Structural Theoretical Principles - tension / compression / shear / load-paths / principles of structural systems.

Materials and Technologies - brick, stone, timber, glass, steel, concrete.

Carbon in Buildings – Operational and Embodied Carbon, passive design and the thermal envelope.

Assembly and the Construction Process – construction details, assembly and work schedules.

Measuring Performance - Building Regulations, air tightness, and other specific approaches to environmental performance.

Building surveying, condition appraisal and report-writing.

Part 3: Teaching and learning methods

Teaching and learning methods: The module time will be organised as follows:

60-hours contact time that includes lecture based sessions, workshop sessions explorng theories of construction;

15-hours small group seminars and technical skills sessions;

90-hours are scheduled for self directed learning in developing the output from survey work, research tasks and case study preparation;

30-hours technical report preparation;

30-hours design report preparation;

75-hours engaged with essential reading.

Total = 300 hours

Scheduled learning:
As detailed above the strategy for the module is to introduce concepts and theories of construction, to develop the ability to understand building defects and condition, to undertake site analysis and surveys, to complete a small design exercise and analyse this in terms of construction sequencing, build programme and embodied energy.

This will be achieved through the following methods: lectures, seminars, tutorials, project supervision, demonstration, practical classes and workshops; fieldwork; supervised time in studio/workshop.

Independent learning:
In order to fulfil the requirements of the module a certain amount of independent learning is required. This time is used to support the taught contact sessions and in preparation of the technical assessment.

This learning will be achieved through the following methods: hours engaged with essential reading, case study preparation, assignment preparation and completion etc. These sessions constitute an average time per level as indicated in the table below. Scheduled sessions may vary slightly depending on the module choices you make.

Technical Report –This major part of the module output is to be an edited account of the student's work that demonstrates the knowledge they have gained from the lecture and seminar series, workshop and lab sessions associated with the module.

Design Report - The module culminates in a construction design intervention project following a defined project brief. This is designed to demonstrate an awareness of structure and theory.

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

MO1 Discuss the range of common principles of load-bearing, framed and long-span structural solutions and explain the basic theoretical concepts associated with each of these.

MO2 Apply principles of material science, sustainability and environmental impact, identify a range of common and emerging construction materials and technologies and explain how they are sourced and processed before being suitable for construction.

MO3 Explain the process of building buildings making reference to the construction process, construction materials, order of assembly and work schedules

MO4 Explain different approaches to producing sustainable buildings and the principles of measuring the environmental performance of buildings with particular emphasis on low carbon approaches and passively designed structures.

MO5 Apply construction principles, structural sizes, and detailing requirements in the design and representation of a small domestic building.

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 225 hours

Face-to-face learning = 60 hours

Total = 300

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/modules/ubllwh-30-1.html

Part 4: Assessment

Assessment strategy: The module is assessed by a substantial Technical Report submitted at the conclusion of the module in April/May. The report (4500 words) will contain the output from weekly sessions including explanations and drawn output of survey work undertaken, design exercises, research studies and data analysis allowing the students to demonstrate a complete grasp of the module requirements. The report will include a separately defined and largely drawn design project demonstrating application of the learning.

Formative activities, research and reading take place through the module and are discussed in workshop sessions allowing students to get feedback on their work.

Assessment tasks:

Report (First Sit)

Description: Technical Report (4000 word) plus Design Report (500 word - image based)
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Report (Resit)
Description: Technical report (4000 words) plus Design Report (500 words) imaged based
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Architecture [Frenchay] BSc (Hons) 2023-24