Module Specification

Thermal Performance

Version: 2023-24, v4.0, 04 Jul 2023

Contents

Part 1: Information

Module title: Thermal Performance

Module code: UBLMJ8-15-M

Level: Level 7

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

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: Introduction to Facade Systems 2023-24

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Co- requisites: students must have already completed or be currently enrolled in UBLLYS-15-M Introduction to Façade Systems. This requirement is compulsory for FT and PT students. Advisory for CPD students who only intend to take an individual module.

Features: Not applicable

Educational aims: To understand building physics in relation to heat loss through the façade, and the risk of condensation.

Outline syllabus: Many countries around the world have set tough, legally binding targets to reduce their carbon dioxide emissions significantly when compared to historical values. In response to this the regulations concerning energy use in buildings are being ever tightened.

The unit starts by introducing the different forms of heat transfer and how they relate to facades. These ideas are further developed to consider how different components and elements may be analysed and assessed.

Thermal bridging can be a significant impairment to the overall thermal performance of a façade. This unit will look at how and why thermal bridges occur, their effects, how they can be reduced and how they can be quantified.

Condensation can, in addition to being unsightly, cause material degradation, reduction in thermal insulation and result in mould which can be harmful to people. Condensation theory and principles are introduced, together with condensation risk analysis.

Part 3: Teaching and learning methods

Teaching and learning methods: The module will be delivered by means of:

Lectures and seminars which enable students to support their own independent learning by exploring deeper issues pertaining to Façade Engineering, visiting speakers will be used to provide up to date material and context to the applications of the subject area.

Directed reading examining the key principles and relevant criteria relating to a number of topics of importance to Façade Engineering.

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

MO1 Identify typical energy flows into and out of building envelopes and evaluate appropriate methods of calculation. (Component A)

MO2 Explore the benefits and disadvantages of controlled air leakage through building envelopes. (Component A,B)

MO3 Critically evaluate the impact of thermal bridges on façade thermal integrity and building envelope performance (Component A, B)

MO4 Identify environmental qualification schemes for building envelopes (Component A)

MO5 Assess condensation risk and its effects on building envelope performance. (Component B)

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 118 hours

Face-to-face learning = 32 hours

Total = 150

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/ublmj8-15-m.html

Part 4: Assessment

Assessment strategy: Assessment will be via an examination and a written assignment.

The examination will take the form of a 24 hour online take home exam (size of task 2 hours) covering a range of topics on the subject of the thermal performance of facades.

The written assignment will focus on condensation analysis, based on a real world practical activity which a professional Façade Engineer would need to undertake, modelled around a realistic situation.

Resit strategy will consist on working through a similar form of assessment, so that the students can improve according to the feedback received.

Assessment tasks:

Examination (Online) (First Sit)
Description: Online Examination (24 hour window)
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Written Assignment (First Sit)
Description: Condensation analysis
Weighting: 75 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO2, MO3, MO5

Examination (Online) (Resit)
Description: Online Examination (24 hour window)
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Written Assignment (Resit)
Description: Condensation analysis
Weighting: 75 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO2, MO3, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Façade Engineering [Frenchay] MSc 2023-24

Façade Engineering [Frenchay] MSc 2023-24

Façade Engineering [Frenchay] MSc 2022-23