



UNIVERSITY COLLEGE
OF ESTATE MANAGEMENT

Design and Environmental Science

Module Descriptor

Module Code: DES5DES

Version: 4.00

Status: Final

Date: 18/01/2021

Summary Module Details

Module details

Module Title: Design and Environmental Science

Module Leader: Jonathan Hubert

Module Mode: Supported online learning

Semester: Spring (UK)

Level: 5

Credits: 20

Learning Hours: 200

Contact and Study Hours

Directed Study Time: 90 hrs (45%)

Self-directed Study Time: 50 hrs (25%)

Assessment Study Time: 60 hrs (30%)

Assessment Type

Coursework: 100%

Computer Marked Assessment: 0%

Self-directed Research Project: 0%

Portfolio: 0%

Module Summary

This module covers key aspects of the theory and practice of design for buildings and the relation of the building to the study of the environment. It applies the building, environment and technology theories covered in previous modules to normal design situations. The module focuses on the understanding of how a building is affected by its design, environment and its occupants, and, vice versa, what effect that building has on the environment and people living in and around it.

The relationship is a complex one, which is addressed here by using 'human comfort' as the overarching theme, and breaking that down into individual factors of heat, air, moisture, sound and light. These factors are placed into the context of a domestic dwelling, with the many and varied conditions that can result, based on different expectations and perceptions of comfort.

Taken on which Programmes

BSc (Hons) Building Control (C)

BSc (Hons) Building Surveying (C)

Core (C) or Elective (E)

Module Aims

This module aims to:

- Build upon students' previously developed knowledge in order that they may be able to design buildings for comfort and climate relevant to location and use;
- Develop understanding of the relationship of heat, air, moisture, sound and light to the form and function of a building;
- Encourage the use of sketching and drawing to solve problems of environmental design for living and working in a changing climate;
- Demonstrate the concepts and principles of heat and thermal insulation, air movement and ventilation, moisture and condensation, noise and sound insulation, natural and artificial light with various types of lighting design;
- Explain the sources and mitigation for various energy processes, with reference to local use in domestic and commercial buildings.

Module Learning Outcomes

- LO1. Apply key concepts, theories and principles relating to design and environmental science using technical information, legislation and standards.
- LO2. Use and interpret information on environmental conditions in a given location via sketches, drawings, data and written description.
- LO3. Discuss the requirements and constraints of codes and regulations relating to heat, airflow, sound and light, having regard for the use of sustainable materials and methods of construction.
- LO4. Use scientific methodology to appraise experiments on building materials and environmental conditions.

Indicative Module Content

Module topics

- **Form and function: technology, aesthetics, sustainability and an international perspective**
Evaluating building technology and building services for designs; analysing the issues to advance the design; aesthetics, sustainability and international perspective, critically considering and recommending design changes in response to this evaluation.
- **'Human comfort'**
Building Regulations and British standards, including international local codes as applicable, Chartered Institute of Building Services Engineers (CIBSE) Guides A and B, occupant behaviour and 'norms' (cultural, regional, gender, age, activity levels).

Design and Environmental Science

- **Design and drawing**

Two components: sketching and drawing by hand, including perspective and working details; Computer Aided Design (CAD) for formal working drawings, with focus on the materials and spaces that influence how, and which services are used e.g. underfloor heating.

- **Environmental conditions**

Five principal factors:

- a. **Heat**

Heat loss and gain in buildings, the effect on building design with reference to local environments (region/climate, housing types, available renewable energy sources).

- b. **Air**

Airflow and moisture, internal to internal, internal to external, thermal transfer versus ventilation, useful exhaust of heat versus uncomfortable draughts. Introduction to Indoor Air Quality metrics.

- c. **Moisture**

The effects of moisture and condensation (interstitial and surface) on material longevity and occupants' health.

- d. **Sound**

Sound and noise insulation, effects of internal and external noise on human comfort, airborne and impact transmission, reverberation time experiment.

- e. **Light**

Light – natural and artificial – design of buildings that meet the physiological and psychological needs of people living/working in those environments.

This content will be reviewed and updated regularly to reflect the legal, moral and financial changes in professional standards and practice.

Overview of Summative Assessment

Module learning outcomes	Assessment	Word count or equivalent	Weighting
LO1, LO2, LO3	Assessment 1 Coursework	1,600 words, or drawings and/or calculation /text.	40%
LO1, LO2, LO3, LO4	Assessment 2 Coursework	2,400 words, or drawings and/or calculation /text.	60%

Module Pass Mark (as a weighted average of all assessments): 40%

Key Module Learning Resources

Core Sources and Texts

The core reading resources within each module will be provided via the specific Virtual Learning Environment (VLE) module pages and within the e-Library. Additional reference material and supplementary resources to support your studies are available through the UCEM e-Library.

Module tools

Students will have access to study materials, dedicated academic support, student forums, and learning activities via an online learning platform (VLE).

The module page on the VLE is broken down into structured study weeks to help students plan their time, with each week containing a mixture of reading, case studies, videos/recordings and interactive activities to go through. Online webinars/seminars led by the Module Leader can be attended in real time and provide opportunities to consolidate knowledge, ask questions, discuss topics and work through learning activities together. These sessions are recorded to support students who cannot attend and to enable students to recap the session and work through it at their own pace. Module forums on the VLE provide further opportunities to discuss topics with other students, complete collaborative work and get extra help from the module team.

Professional online resources

The e-Library provides access to trusted, quality online resources, selected by subject specialists, to support students' study. This includes journals, industry publications, magazines, academic books and a dissertation/work-based library. For a list of the key industry specific and education resources available please visit [the VLE e-Library](#).

Other relevant resources

Access is also provided to further information sources that include the British Library and Open University UK catalogues, as well as providing a monthly current awareness service entitled, **Knowledge Foundations** - a compendium of news, research and resources relating to the educational sector and the Built Environment.

The module resource list is available on the module website and is updated regularly to ensure materials are relevant and current.