UNIVERSITY COLLEGE
OF ESTATE MANAGEMENT

Technology and Design 2: Data Informed Design for Commercial Buildings

Module Descriptor

Module Code:	TEC6DE2
Version:	1.00
Status:	Final
Date:	14/04/2024

Summary Module Details

Module details

Module Title: Technology and Design 2: Data Informed Design for Commercial Buildings

Module Leader: Marc Fleming

Module Mode: Supported online learning

Semester: Autumn (UK)

Level: 5

Credits: 20

Learning Hours: 200

Contact & Study Hours

Directed Study Time: 60 hrs (30%)

Self-directed Study Time: 70 hrs (35%)

Assessment Study Time: 70 hrs (35%)

Assessment Type

Coursework: 0%

Computer Based Assessment: 0%

Portfolio: 100%

Presentation: 0%

Project: 0%

Practical: 0%

Self-directed Research: 0%

Module Summary

This module involves the application of thematic knowledge where innovative forms of construction technologies are proposed against the context of Industrial and Commercial building types. This module will require students to utilise digital design tools to simulate energy performance analysis of design concepts, evolving to a final proposal that will incorporate environmental design strategies based on data from the simulation. Students will be required to create holistic and technically designed solutions that are predicated on data and responsive to client and design brief requirements which will undergo critical analysis prior to the adoption of digital tools. The solutions will also acknowledge regulatory compliance and global sustainability issues.

3D Computer generated design concepts will evolve to a 3D model of the final proposal that will aspire to have the level of detail required at Stage 4 of the RIBA Plan of Work. Work will be presented using a range of media to illustrate levels of detail and visualisation of the design process, culminating with the detailed, final design proposal, including passive energy simulation which will be critiqued, along with chosen design, technologies, and strategies during an oral presentation. Students may also elect to animate elements of the

building to showcase proposals and relative information that can enhance overall presentation for critique purposes.

Taken on which Programmes

BSc (Hons) Architectural Design Technology (C)

Core (C) or Elective (E)

Module Aims

This module aims to:

- Develop students' design development skills through interpreting a design brief that composes of client and environmental design challenges.
- Provide an opportunity to interact with and understand the level of detail required for architectural documentation for each stage up to stage 4 of the RIBA Plan of Work.
- Equip students with conceptual design modelling skills that can be interpreted utilising specialist software to perform simulated energy analysis.
- Introduce students to the concept of utilising conceptual data analysis to inform design decision making processes.
- Allow students to select appropriate forms of digital design tools to enable the design and analysis of a building concept.
- Develop students' abilities to transform the passive performance of a conceptual design by altering building form, orientation and applying appropriate construction technologies to assist decision making in optimising building performance.
- Utilise computer software to develop conceptual designs into 3D Information models.
- Develop students' abilities to present, defend and justify a design solution whilst under scrutiny and technical questioning from design professionals.

Module Learning Outcomes

LO1. Evaluate and interpret a design problem against the context of a commercial building through the application of digital design tools.

LO2. Use computational design tools to produce design concepts and a working 3d information model.

LO3. Use computational design tools to evaluate design proposals for their sustainability, functional and regulatory compliance.

LO4. Justify data driven design strategies through oral presentation and critique.

Indicative Module Content

Module topics

- Conceptual modelling using computational design tools.
- Commercial (and non-domestic) materials and construction technologies.
- Sustainability design guidance for non-domestic buildings (BREEAM etc.).
- Legal and regulatory design parameters for non-domestic buildings.
- Using computational tools to perform passive energy analysis of design concepts.

- Geometric modelling to information modelling.
- File classification systems and interoperability.
- Technical design and construction detailing.
- Use of advanced computational tools to create and present design proposals.
- Principles and techniques for effective architectural presentation.

This content will be reviewed and updated regularly to reflect the legal, ethical, 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** Portfolio	4,000	80%
LO4	**Assessment 2** Portfolio	1,000	20%

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.

This is a design orientated module relative to design problem. As such, this requires dedicated design studio time to allow students to navigate the design process. Studio time will also be accompanied by dedicated, Tutor supported workshops where CAD modelling and digital presentation techniques will be hosted to support the development of student work to industry standard. Workshops and Tutorials will be supplemented periodically by lectures.

Given the nature of the provision, dedicated Virtual Design Studios will be provided and supplementary vendor specific resources will be provided to allow students to work independently out with contact time with Tutors.

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 VLE page and is updated regularly to ensure materials are relevant and current.