Module Definition Form (MDF)

Module code: MOD008163	**Version:** 2 **Date Amended:** 20/Jun/2024

1. Module Title
Advanced Technology and Environmental Impact

2a. Module Leader
Graham Terry

2b. School
School of Engineering and the Built Environment

2c. Faculty
Faculty of Science and Engineering

3a. Level
5

3b. Module Type
Standard (fine graded)

4a. Credits
30

4b. Study Hours
300

5. Restrictions			
Type	**Module Code**	**Module Name**	**Condition**
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	FdSc Surveying, FdSc Construction Management, BSc (Hons) Building Surveying, BSc (Hons) Construction Management, BSc (Hons) Quantity Surveying, FdSc and BSc (Hons) Architectural Technology.		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

This advanced technology module is designed to develop your technical knowledge and the skills to apply that knowledge in the context of both new build and refurbishment work.

The focus of this module leads on from domestic construction and provides a broad understanding of the way we build commercial and industrial buildings. The module will consider the functional requirements of single-storey industrial sheds and multi-storey framed structures in concrete and steel. In addition, the effects of the latest legislation in relation to fire and health & safety on the construction process are examined.

The application of Building Regulations and the associated Approved Documents to both commercial and industrial buildings will be explored. You will compare different construction methods and analyse suitable applications for each method. In particular: frames, cladding systems, internal walls, structural flooring and roofing will form key areas of the module. This analysis will include considerations of buildability, pre-fabrication, value for money and whole life costs.

Environmental performance and sustainability are a central part of this module and you will investigate how to ensure high levels of environmental performance through using insulation, maintaining airtightness and the installation of building services and controls. You will have the opportunity to compare the installation requirements of natural and forced ventilation systems and different methods of heating and cooling commercial and industrial buildings. The provision of high quality IT and communications infrastructure systems will also be investigated. You will be introduced to standard methods of assessing and measuring the environmental performance of buildings, such as Pasivhaus and BREEAM and be able to suggest improvements to building performance and sustainability.

6b. Outline Content

Knowledge and Understanding

- Portal and other types of frame suitable for use in large, low rise industrial buildings.
- Multi storey frame systems and the methods used to construct them.
- Structural flooring systems for medium and high-rise buildings.
- Cladding systems and windows for medium and high-rise buildings.
- Roofing systems for medium and high-rise buildings, including traditional roofing methods, single membrane systems, warm and cold roof construction and green roofs.
- Internal partitions and office systems for commercial buildings
- The installation and coordination of heating and ventilating systems for commercial buildings
- The installation and coordination of lighting systems for commercial buildings
- Building regulations relating to commercial and industrial buildings.
- Fire regulations relating to; means of escape, the provision of fire-resistant materials and finishes, compartmentation and cavity barriers.
- The environmental impact and sustainability issues to be considered when making decisions regarding building construction and servicing.
- Standard methods of assessing and measuring the environmental performance of buildings, such as Pasivhaus and BREEAM.
- Energy transfer, seasonal heat losses and gains, SAP Rating, Building Regulation compliance, thermal comfort.
- Visual comfort, lighting standards, daylighting and artificial lighting of buildings.
- Aural comfort, noise and buildings, internal acoustics.

Skills Analysis

- The ability to produce written justification of technological solutions to construction briefs
- Use drawings and structural details to support and justify technological recommendations.
- Be able to justify recommendations based on sustainability, environmental performance, value for money, buildability and whole-life performance.
- Production of calculations to assess the thermal, lighting and sound transmittance performance of a domestic building.

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources

None

7. Learning Outcomes (threshold standards)		
No.	**Type**	**On successful completion of this module the student will be expected to be able to:**
1	Knowledge and Understanding	Describe and illustrate the function and performance of typical components and technologies used in industrial and commercial buildings
2	Knowledge and Understanding	Appraise the use of a particular technology for industrial and medium to high rise commercial buildings
3	Knowledge and Understanding	Understand how building services are coordinated and incorporated with the structure of commercial buildings.
4	Knowledge and Understanding	Predict the environmental performance of buildings and their external elements using a number of modelling techniques.
5	Intellectual, practical, affective and transferrable skills	Evaluate the environmental, financial and practical performance of construction technologies and service installations.
6	Intellectual, practical, affective and transferrable skills	Analyse, evaluate and suggest improvements to the environmental performance of a domestic building.

8a. Module Occurrence to which this MDF Refers				
Year	**Occurrence**	**Period**	**Location**	**Mode of Delivery**
2025/6	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	**Hours**	**Learning Outcomes**	**Details of Duration, frequency and other comments**
Lectures	48	1-6	4 hours a week
Other teacher managed learning	24	1-6	2 hours a week
Student managed learning	228	1-6	Private Study
TOTAL:	300		

9. Assessment for the above Module Occurrence					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
010	Coursework	1-3,5	60 (%)	Fine Grade	30 (%)
Individual report maximum 2500 words					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
011	Coursework	4,6	40 (%)	Fine Grade	30 (%)
Individual report maximum 2000 words					

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]