Module Definition Form (MDF)

Module code: MOD008414	**Version:** 2 **Date Amended:** 13/Jun/2024

1. Module Title
Technology B2 (Architecture)

2a. Module Leader
Graham Terry

2b. School
School of Engineering and the Built Environment at Anglia Ruskin University

2c. Faculty
Faculty of Science and Engineering

3a. Level
5

3b. Module Type
Standard (fine graded)

4a. Credits
15

4b. Study Hours
150

5. Restrictions

Type	Module Code	Module Name	Condition
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	BA (Hons) Architecture		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

This module is designed to develop your technical knowledge and skills to support your learning in Design Studio B2. Leading on from Technology A and B1, the module will elaborate and increase complexity in the appreciation of technical choices to achieving a high level of environmental performance in buildings.

You will investigate some of the issues and design processes associated with the design of sustainable construction. You will learn to consider the functional requirements and compare sustainable methods of construction and analyse suitable applications for each method. In particular: foundation, cladding systems, internal walls, structural flooring, and roofing will form key construction element of the module. The module will also cover knowledge and skills required within the designing of components, their performance specification, life-cycle and cost analysis, value for money; production processes, quality control, and associated trades, together with an appreciation of their on-site buildability within a strategic framework related to sustainability and energy performance. In addition, the effects of the latest legislation in relation to fire and health & safety on the construction process are examined.

You are explained the principles of building energy modelling and are shown how BIM enables designers to improve environmental performance in different stages of the design process. BIM considers the entire life cycle of a building, from its conceptualization to analysis, construction, maintenance and demolition. By using complementary BIM tools you will be encouraged to take a holistic approach to the buildings design, allowing use to study different design alternatives, achieve more accurate results and make more effective and sustainable decisions earlier in the design process. This approach will give you the opportunity to collaborate to get interconnected data within a model to design, simulate, and visualize a project and share building performance data to raise industry awareness and encourage the growth of a zero-carbon culture.

The module introduces to the different approaches to create 3D Geometry and designing building forms in a BIM environment. Conceptual energy modelling using masses will be introduced to allow evaluation of schematic concepts and preliminary designs in the early stages of a project, which can then drive design decisions that improve sustainability. Once the design is finalised you are shown how to generate integrated models which allows you to perform Building Energy Analysis and Heating and Cooling Analysis.

You are also shown how to improve visualization to communicate virtual design features with clients by showcasing how they look in real life; and by being able to produce adequate detailed designs to allow for airtightness and thermal integrity. In addition, the application of Building Regulations and the associated Approved Documents is explored and the effects of the latest legislation in relation to energy, carbon reduction, fire and health & safety on the construction process are examined.

6b. Outline Content

Knowledge and Understanding:

- The structural forms for medium scale building.
- Functional requirements, typical methods of construction of foundations in medium scale buildings: deep foundations.
- Functional requirements, typical methods of construction and construction details of internal walls in medium and high-rise buildings.
- Functional requirements, typical methods of construction and construction details of cladding systems in medium and high-rise buildings: Double-envelope construction; rainscreen cladding; curtain wall systems; green walls; living walls; windows and glazing.
- Functional requirements, typical methods of construction and construction details of roof in medium and high-rise buildings: flat and pitched construction solutions; warm, cold and inverted roof construction and green and blue roofs.
- Functional requirements, typical methods of construction and construction details of structural flooring systems in in medium and high-rise buildings.
- Construction components: performance specification, life-cycle and cost analysis, value for money; production processes, quality control, on-site buildability and associated trades.
- Building Regulations, Approved Documents and CDM Regulations and other relevant safety legislation
- Understand the principles of fire and smoke generation and their spread and develop details and specify in a way that protects users of buildings and the public from fire and the spread of smoke.
- Fire regulations relating to means of escape, the provision of fire-resistant materials and finishes, Building Regulations and introduction of relevant regulations and secondary legislation relating fire and structural safety for medium-rise buildings.
- Performance of major energy demanding building technologies (ventilation, heating, cooling, hot water and lighting).
- Building energy modelling.
- Conceptual energy analysis.
- Heating and Cooling Analysis.
- The environmental impact and sustainability issues to be considered when making decisions regarding building construction based on key legislation, regulations and policies in respect of the climate and ecological.

Skills based:

- The ability to produce written justification of technological solutions to construction briefs (technical reports).
- Use drawings and construction 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.
- Correct use of specialised terminology commonly used within the industry.
- Problem-solving in relation to materials, methods of construction. .
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- Problem-solving in relation to materials, methods of construction.

6c. Key Texts/Literature

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

6d. Specialist Learning Resources

LinkedIn Learning

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, performance and sustainability requirements of typical components and technologies used in medium scale buildings.
2	Knowledge and Understanding	Demonstrate knowledge and understanding of safety-issues related to fire and how they relate to architectural design.
3	Knowledge and Understanding	Simulate and evaluate the environmental performance of buildings using a number of BIM modelling tools.
4	Intellectual, practical, affective and transferrable skills	Professionally communicate in a professional way the environmental and energy performance of a design project through a variety of reporting and visualization strategies.

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	12	1-2	1 hours per week
Other teacher managed learning	12	2-4	Plus, students are expected to take part in two, one day “crits” in the studio timetabled concurrently with their design module.
Student managed learning	126	1-4	Private study
TOTAL:	150		

9. Assessment for the above Module Occurrence					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
010	Coursework	1-4	100 (%)	Fine Grade	40 (%)
Individual report maximum 2400 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]