



## Module Definition Form (MDF)

<b>Module code: MOD010257</b>	<b>Version: 2    Date Amended: 03/Jul/2024</b>
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<b>1. Module Title</b>
Materials, Design and Construction Project

<b>2a. Module Leader</b>
Abhijit Ganguli

<b>2b. School</b>
School of Engineering and the Built Environment

<b>2c. Faculty</b>
Faculty of Science and Engineering

<b>3a. Level</b>
4

<b>3b. Module Type</b>
Standard (fine graded)

<b>4a. Credits</b>
30

<b>4b. Study Hours</b>
300

<b>5. Restrictions</b>			
Type	Module Code	Module Name	Condition
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
<b>Courses to which this module is restricted:</b>	None		

## LEARNING, TEACHING AND ASSESSMENT INFORMATION

### 6a. Module Description

This module will focus on the initial design, where you will be required to carry out investigations into the suitability of various materials for the construction of elements of the project, taking into account not only the mechanical properties of these materials but also sustainability and economic considerations. You'll gather and analyse laboratory data on the mechanical properties of various construction materials and use different statistical approaches for an informed sampling, and quality control. You will analyse and design a simple structure in this project, applying basic static and design principles to define the dimensions of the structural elements. In addition, you'll construct an element of the project which will develop your skills relating to the programming of the construction process, health and safety management (CDM Regulations), and teamwork, where you will develop an inclusive and supportive culture to achieve your project's goals. You'll also be working on a construction project for a first-hand construction experience. The Live Brief task within your project gives you the opportunity to work with professionals within the Civil Engineering industry. You will receive guidance, support and feedback from professionals in the industry.

### 6b. Outline Content

#### Construction Materials

- Properties of construction materials: density, strength, stiffness, durability
- Sustainability of construction materials
- Statistical lab test quality control and sampling
- Descriptive statistics to describe characteristics and relationships/correlation

#### Structures

- Behaviour of the different structural members made from the commonly used construction materials, including steelwork, concrete and timber, etc.
- Use of shear force and bending moment diagrams
- Design philosophy and process, applied to a simple structure

#### Construction Processes

- Use of method statements.
- Site set up and the importance of planning and organising resources.
- Health and safety on a construction site.
- Current Acts and Regulations and the responsibilities that flow from them, including the functions under CDM of the designer, planning supervisor, principal contractor, other contractors, and the client.

#### Skills:

- Effective teamwork
- Effective communication to non-technical and technical audiences
- Referencing and citation skills
- Technical report writing
- Problem solving
- Hazard spotting and risk assessment
- Effective planning and organisation
- Effective autonomous work
- Data interpretation and statistical analysis
- Creative design

### 6c. Key Texts/Literature

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

## 6d. Specialist Learning Resources

- Material lab
- Construction fieldwork
- Workroom

## 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	Understand the application of health and safety legislation and procedures to a construction project.
2	Knowledge and Understanding	Collect, interpret, and present information using labs and workshop skills to assess the suitability of construction material and sustainability in the built environment project.
3	Knowledge and Understanding	Identify and select engineering principles and appropriate material, equipment and engineering processes to carry out simple design solutions for complex problems.
4	Knowledge and Understanding	Demonstrate an appreciation of the health and safety requirements and legislations related the use of lab spaces, equipment, and procedures to a construction project.
5	Intellectual, practical, affective and transferrable skills	Use engineering science and mathematics to develop engineering design solutions to the built environment challenges using integrated approaches and evaluate their environmental and societal impact.
6	Intellectual, practical, affective and transferrable skills	Present and communicate technical concepts effectively to a range of stakeholders through well-constructed arguments developed by critically evaluating technical literature.

## 8a. Module Occurrence to which this MDF Refers

Year	Occurrence	Period	Location	Mode of Delivery
2024/5	ZZF	Template For Face To Face Learning Delivery		Face to Face

**8b. Learning Activities for the above Module Occurrence**

<b>Learning Activities</b>	<b>Hours</b>	<b>Learning Outcomes</b>	<b>Details of Duration, frequency and other comments</b>
Lectures	36	1-4	Normally 3 hrs of 12 sessions: However, this should be scheduled in accordance with the project requirements
Other teacher managed learning	36	2,4,5,6	Normally 3 hrs of 12 sessions: However, laboratories, practicals, workshops, field work, scheduled in accordance with the project requirements.
Student managed learning	228	1-6	Group work, autonomous study and individual learning activities.
<b>TOTAL:</b>	<b>300</b>		

<b>9. Assessment for the above Module Occurrence</b>					
<b>Assessment No.</b>	<b>Assessment Method</b>	<b>Learning Outcomes</b>	<b>Weighting (%)</b>	<b>Fine Grade or Pass/Fail</b>	<b>Qualifying Mark (%)</b>
010	Coursework	2,4	30 (%)	Fine Grade	30 (%)
<b>Materials (1000 words equivalent, individual report) This element is aligned with the C12, and C13 Engineering Council's AHEP4 Learning Outcomes and JBM's thread Materials.</b>					
<b>Assessment No.</b>	<b>Assessment Method</b>	<b>Learning Outcomes</b>	<b>Weighting (%)</b>	<b>Fine Grade or Pass/Fail</b>	<b>Qualifying Mark (%)</b>
011	Coursework	1,4,6	20 (%)	Fine Grade	30 (%)
<b>Fieldwork method statement and construction reflection report (1000 words equivalent individual report) This element is aligned with the C16, and C18 Engineering Council's AHEP4 Learning Outcomes and JBM thread Professionalism and Ethics. It is also aligned with the C9 Engineering Council's AHEP4 Learning Outcomes and JBM's thread Health and Safety and Construction Management.</b>					
<b>Assessment No.</b>	<b>Assessment Method</b>	<b>Learning Outcomes</b>	<b>Weighting (%)</b>	<b>Fine Grade or Pass/Fail</b>	<b>Qualifying Mark (%)</b>
012	Coursework	1-6	50 (%)	Fine Grade	30 (%)
<b>Client Report 3000 words equivalent (group report) and Client presentation (group presentation of 10 minutes) This element is aligned with the C13 Engineering Council's AHEP4 Learning Outcomes and JBM's thread Design and Structure. This element is aligned with the C6 and C17 Engineering Council's AHEP4 Learning Outcomes and JBM's threads Design, and Sustainability.</b>					

**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]**