



Module Definition Form (MDF)

Module code: MOD007058	Version: 3 Date Amended: 06/May/2024
1. Module Title	
Civil Engineering Materials and Manufacture	
2a. Module Leader	
Abhijit Ganguli	
2b. School	
School of Engineering and the Built Environment	
2c. Faculty	
Faculty of Science and Engineering	
3a. Level	
6	
3b. Module Type	
Standard (fine graded)	
4a. Credits	
15	
4b. Study Hours	
150	

5. Restrictions			
Type	Module Code	Module Name	Condition
Pre-requisite:	MOD010256	Sustainable Conceptual Design for Civil Engineering	Compulsory
Pre-requisite:	MOD010255	Structure and Construction Project	Compulsory
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	BEng and MEngs in Civil Engineering		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description
<p>Develop your understanding of construction materials and the related construction techniques which are prevalent in the construction industry. You will enhance your skills in critically evaluating the key properties and key construction methods of civil engineering construction materials in order to make informed and efficient engineering design proposals.</p> <p>Additional aspects of civil engineering materials, manufacture and construction that will be covered include material durability, fire resistance, quality control, recycling / re-use of construction materials, selected construction details such as structural connections and movement joints.</p>

6b. Outline Content

Materials:

- Concrete additives.
- Processed timber products and their uses.
- Polymers and reinforced polymers in construction.
- Bituminous materials (properties and specification).
- Quality control and specification of construction materials.
- Behaviour of materials in service (durability, fire resistance / fire protection).
- Construction Methods:
- Consider a range of typical construction methods for timber, steel and concrete.
- Use case studies to review developments in construction methods.
- Review the relevance of construction methods to given design scenarios, e.g. structural forms, economical spans and economic structural sizes.

Structural Details:

- Connections (steel, timber, glulam, concrete fixings)
- Movement joints and bearings.
- Thermal, moisture and creep displacements in structures. Low carbon design
- Efficient use of materials.
- Embodied carbon calculations.
- Recycling of material.
- Re-use of structures.
- Re-use of structural elements

6c. Key Texts/Literature

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

6d. Specialist Learning Resources

Materials laboratory

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	Demonstrate an understanding of the properties and uses of civil engineering materials in both written work and practical / laboratory exercises.
2	Knowledge and Understanding	Critically discuss the advantages and disadvantages of different forms of construction commonly used in the civil engineering industry.
3	Intellectual, practical, affective and transferrable skills	Identify and specify appropriate materials for built environment applications considering plant, equipment, technologies and processes. Recognise the limitations of construction processes and methods.
4	Intellectual, practical, affective and transferrable skills	Demonstrate an understanding for buildability, sustainability, and economics in the selection of materials and construction methods.

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			
Learning Activities	Hours	Learning Outcomes	Details of Duration, frequency and other comments
Lectures	24	1-2	2 hours of lectures per week
Other teacher managed learning	12	3-4	1 hour of laboratory / tutorial per week
Student managed learning	114	1-4	Autonomous study and individual learning activities.
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	50 (%)	Fine Grade	30 (%)
1000 word equivalent report - This assessment is aligned with Engineering Council's AHEP4 learning outcomes C12, C13 and JBM's thread: Sustainability.					
Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
011	Examination Chelmsford	1, 2, 3	50 (%)	Fine Grade	30 (%)
2 hour Open Notes examination - This assessment is aligned with Engineering Council's AHEP4 learning outcome C13. Students are allowed to bring 3 A4 sheets of handwritten or typed notes on both sides.					

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]