

Liverpool John Moores University

Title: CONSTRUCTION METHODS 2 - MMC DOMESTIC DWELLINGS
Status: Definitive
Code: **5602BECC** (125599)
Version Start Date: 01-08-2021

Owning School/Faculty: Civil Engineering and Built Environment
Teaching School/Faculty: Coleg Cambria

Team	Leader
Spencer Kelly	Y

Academic Level: FHEQ5
Credit Value: 20
Total Delivered Hours: 56
Total Learning Hours: 200
Private Study: 144

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	20
Tutorial	20
Workshop	14

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	2500 word illustrated report	50	
Exam	AS2	Closed book examination	50	2

Aims

To provide students with a critical understanding of framed structures and the materials used in their construction.

Learning Outcomes

After completing the module the student should be able to:

- 1 Analyse the sequence of technology required to design and execute appropriate substructure works to a framed building.
- 2 Demonstrate knowledge, understanding and application of the superstructure and construction details of moderately complex buildings including basic structural analysis and common loading arrangements.
- 3 Demonstrate a sound and applied knowledge of safe, efficient and innovative construction techniques.
- 4 Understand the factors that affect the specification of materials and building services

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

2500 word illustrated report	1	2	4
Closed book examination	3		

Outline Syllabus

Demolition

Legislative requirements; demolition techniques; waste disposal; health and safety issues; risk assessments

Foundations and Site design

Principal elements; soil conditions and their interaction; common foundation types; interface with superstructure. Substructure design and construction with waterproofing, retaining walls, temporary support.

Methods of excavation; control of ground water levels for large projects; earthwork support systems; methane gas control.

Strategic site analysis considering basic principles of sustainable design, site specific design, design precedent, opportunities for renewable technologies and the impact of buildings on their immediate environment.

Structural frames

Historical development; economics of layout and material selection; thermal, wind and temperature effects; structural integrity.

Structural Design and Detailing

Basic structural theory in relation to tension, compression, bending, shear and deflection of steel and concrete beams; application to the approximate sizing of simple beams, continuous beams, cantilever beams, composite beams, trusses, slabs, columns and walls. Reinforcement theory.

Structural Materials

Properties and environmental impact; timber, steel, reinforced concrete, plain and reinforced masonry, glass; alternative structural systems – simple frames, portal frames and load bearing walls; vertical and lateral loading; lateral stability including diagonal bracing, shear walls and moment connections; integration of structure and architectural design

Construction

Alternative materials and systems for roofing, cladding and flooring; assembly of components and installation of systems; environmental impact and architectural considerations; impact of interstitial condensation; basement waterproofing and foundation strategies; construction of retaining walls, earthworks and hard standings.

Floor construction

Principal aspects of structural integrity; common forms of construction; precast, pre-stressed and in-situ members; composite; interface with structural elements. interface with frame; common forms and development of large prefabricated components

Fabric Space Division and Finishes

Interface with frame; common forms and development of large prefabricated components. Building Regulations and space planning constraints; functional analysis of space to determine partitioning and finishes; common types of partition and finishes.

Prefabrication technologies

Historical development; techniques; materials

Environmental considerations of construction techniques and specification choices; moisture performance.

Learning Activities

Being a highly visual module, you will be exposed to a range of resource material including PowerPoint, images, videos, technical literature and case studies. Wherever possible, a site visit will also be arranged to supplement the class based delivery and discussed further on return to the lecture room. The delivery will be consolidated with tutorial questions for discussion, answers to which are uploaded after the class for you to refer to. The main emphasis on the assessment will consider the analysis of details from currently completed buildings and their evaluation within the selection of materials and construction process.

Notes

This module enhances the capability of students to develop detailed analysis and synthesis skills to the understanding of framed structures and the materials used in their construction.

This is achieved by a clear demarcation between substructure and superstructure elements which is an essential element of the assessment strategy.