Liverpool John Moores University

Title:	ADVANCED STRUCTURES AND MATERIALS
Status:	Definitive
Code:	**6252BEUG** (125678)
Version Start Date:	01-08-2020
Owning School/Faculty:	Civil Engineering and Built Environment
Teaching School/Faculty:	Civil Engineering and Built Environment

Team	Leader
Ana Armada Bras	Y

Academic Level:	FHEQ6	**Credit Value:**	20	**Total Delivered Hours:**	50
Total Learning Hours:	200	**Private Study:**	150		

Delivery Options
Course typically offered: Semester 1

Component	Contact Hours
Lecture	22
Practical	4
Workshop	22

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Open Book Exam	50	2
Report	AS2	Report	50	

Aims

To develop and consolidate the structural application, design, evaluation and analysis introduced at Level 5 with more advanced application to steel, masonry, pavement for roads and highways and concrete building elements/structures, using the current codes of practice including the EC code of practices. To develop knowledge on new advancements in materials used within construction.

Learning Outcomes

After completing the module the student should be able to:

1	Critically analyse the design process and apply it to complex structural elements using different building materials and under different environmental and loading conditions.
2	Produce and critically review safe and economical designs of structures in accordance with the current codes of practice.
3	Critically analyse the materials requirements for specific structural and non-structural applications considering new developments in material technology.
4	Analyse the behaviour of materials under fire conditions.

Learning Outcomes of Assessments

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

OPEN BOOK EXAM	1	2	3	4
REPORT	1	2	3	4

Outline Syllabus

Reinforced concrete work to EC2: Frame analysis- design and detailing,
Prestressed concrete; Pre-tensioned and Post-tensioned flexural members, losses of pre-stress force.
Steelwork to EU 3: laterally unrestrained beams, plate girders, cased columns and steel bracing.
Loading conditions (to EC1) for masonry construction.
Material selection to consider design for durability, life cycle planning and maintenance.
Assessment of innovative materials within construction.
Fire: combustion and spread of fire, behaviour and deterioration of structural materials in fire conditions.

Learning Activities

Lectures, workshops and practicals. Industry case studies will be used.

Notes

This module is intended to extend, develop and consolidate the structural design introduced at Level 5, with particular reference to the use of the current EC Codes of Practice and other Standards in practical and more advanced design levels using different loading and environmental conditions. On completion of the module students should have an understanding of the performance of a range of materials commonly used in the design of structures and an appreciation of new developments

in the industry.