

Liverpool John Moores University

Title: PROPERTIES OF MATERIALS
Status: Definitive
Code: **4010BEUG** (102732)
Version Start Date: 01-08-2016

Owning School/Faculty: Civil Engineering
Teaching School/Faculty: Civil Engineering

Team	Leader
William Atherton	Y

Academic Level: FHEQ4
Credit Value: 12
Total Delivered Hours: 50
Total Learning Hours: 120
Private Study: 70

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	24
Practical	12
Tutorial	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	open book	50	2
Portfolio	AS2	laboratory/application based assignments	50	

Aims

To enable students studying construction and civil engineering related programmes to analyse investigate and evaluate scientific principles and the properties and behaviour of construction materials.

To examine factors which affect the performance of materials leading to

deterioration.

To examine how materials may be modified to change their properties and performance.

Learning Outcomes

After completing the module the student should be able to:

- 1 Explain the properties of materials justifying the reasons for their selection and their effect on the design of buildings and installations.
- 2 Predict the short and long term structural behaviour of materials and apply suitable methods of protection.
- 3 Consider the effects of material selection on the environment and discuss suitable alternatives and possibilities for recycling.
- 4 Perform laboratory experiments and deal with recording, analysing and reporting of results.

Learning Outcomes of Assessments

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

EXAM	1	2	3
PORTFOLIO	4		

Outline Syllabus

Considers the important properties, design criteria and the specification of materials including concrete, metals, alloys, timber (including engineered timbers), clay products, insulation materials and plastics including vapour and damp-proofing barriers.

The use protective coatings including paints, stains and renders will be considered. Will provide an introduction to the behaviour of materials in structural terms with reference to beams, columns and foundations.

The need for maintenance and replacement of building components will be considered along with an introduction to sustainability and environmental issues relating to construction.

Learning Activities

The module is based on a lecture and tutorial programme including video and Power-Point presentations together with a number of practical sessions. Students should develop a competence in using scientific equipment using an active learning approach.

Laboratory work will have an emphasis on the manipulation, interpretation and analysis of the data, which should allow reasoned conclusions and recommendations to be made.

Assignments will be formulated to link the selection of materials to suitable applications within the construction industry.

Notes

The module is designed to provide the student with a sound basic understanding of the behaviour of the principal materials used in construction. The module explains the principles on which the properties of materials are founded and the factors relating to behaviour and selection for use in construction. The practical aspect of the module includes the tests required to assess the most important properties and qualities of the principal materials. In terms of the environmental issues, consideration is given to the impact of the selection of certain materials in relation to others along with the health and safety implications.