

Liverpool John Moores University

Title: SCIENCE AND MATERIALS
Status: Definitive
Code: **4558BEFD** (118422)
Version Start Date: 01-08-2011

Owning School/Faculty: Built Environment
Teaching School/Faculty: Stockport College

Team	Leader
Russell Bennett	Y

Academic Level: FHEQ4 **Credit Value:** 24.00 **Total Delivered Hours:** 72.00

Total Learning Hours: 240 **Private Study:** 168

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24.000
Practical	24.000
Tutorial	24.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	science based report	40.0	
Report	AS2	materials report	35.0	
Test	AS3	In class assessment on structures	25.0	

Aims

To apply the basic scientific principles to building design and performance.
To investigate and evaluate the characteristics, properties and use of materials in construction.
To analyse the effects of structural behaviour on construction components.

Learning Outcomes

After completing the module the student should be able to:

- 1 Apply basic scientific principles in the context of the built environment and understand their relevance to building design and performance.
- 2 Perform laboratory experiments and deal with recording, analysing and reporting of results.
- 3 Demonstrate the properties of building materials and understand their performance characteristics with regard to the natural environment with consideration of any potential impacts.
- 4 Compare the use of construction materials by examining technical reports, research information and case studies.
- 5 Investigate and analyse the effects of the structural behaviour of materials.
- 6 Apply the concepts of simple structural analysis in relation to building elements and use appropriate formulae.

Learning Outcomes of Assessments

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

SCIENCE REPORT	1	2
MATERIALS REPORT	3	4
IN CLASS TEST	5	6

Outline Syllabus

Science:

Thermal capacity, insulation, vapour and condensation, ventilation, natural and artificial lighting, smoke, fire, sound and weather.

Building Regulation Control and the conservation of energy including carbon emissions and performance control.

Building services including water, both cold and hot along with sewage, power, both fossil and renewable resources, human comfort, heating, cooling and ventilation, fire and security protection.

Materials:

Aggregates, bricks and brickwork, cement, mortar, concrete, metals and alloys including steel, timber, glass, polymers, plaster, paint and aspects of durability and recycling. Health and safety including hazard identification, associated risks and controls.

Structural behaviour of materials used for beams, columns, frames, floors.

Learning Activities

The module is based on a lecture tutorial programme, supported by films, videos,

slides and visits to laboratories will be used in support of this programme. Work should be practically applied, relevant to the the construction and property sector, and teaching strategy should not be too theoretical. The module contains some laboratory, experimental and practical work and students should develop a competence in using scientific equipment, recording and analysing results. An active learning approach is preferable to the traditional approach.

References

Course Material	Book
Author	Taylor, G.D.
Publishing Year	2000
Title	Materials in Construction
Subtitle	An Introduction
Edition	3rd Edition.
Publisher	Longman.
ISBN	0582368898.

Course Material	Book
Author	McMullan, R.
Publishing Year	2007
Title	Environmental Science in Building
Subtitle	
Edition	6th Edition.
Publisher	Palgrave Macmillan.
ISBN	0230525369.

Course Material	Book
Author	Chartered Institute of Building Services Engineers
Publishing Year	0
Title	'CIBSE Guide,
Subtitle	Codes of Practice and Publications'
Edition	
Publisher	
ISBN	

Course Material	Book
Author	Seward, D.
Publishing Year	2003
Title	Understanding Structures
Subtitle	Analysis, Materials, Design
Edition	3rd Edition
Publisher	Palgrave Macmillan
ISBN	0333973860

Course Material	Book
Author	Beggs, C (2009)
Publishing Year	2009
Title	Energy: Management, Supply and Conservation
Subtitle	
Edition	2nd Edition.
Publisher	Butterworth-Heinemann.
ISBN	0750686707

Course Material	Book
Author	Phillips, D.
Publishing Year	2004
Title	Daylighting
Subtitle	Natural Light in Architecture
Edition	
Publisher	Architectural Press.
ISBN	0750663235

Course Material	Book
Author	CIBSE
Publishing Year	2004
Title	Guide F: Energy Efficiency in Buildings
Subtitle	
Edition	
Publisher	CIBSE.
ISBN	1903287340.

Course Material	Book
Author	Race, G
Publishing Year	2006
Title	Comfort
Subtitle	
Edition	
Publisher	CIBSE.
ISBN	1903287677.

Notes

The module is designed to provide the student with a sound basic understanding of the characteristics and behaviour of the principal materials used in construction. Consideration is given to the environmental, health and safety issues relating to the use and selection of materials used in the construction and services provision of buildings. It goes on to apply scientific principles to environmental issues within construction.

