

## Summary Information

Module Code	4507ICBTBS
Formal Module Title	Science and Materials
Owning School	Civil Engineering and Built Environment
Career	Undergraduate
Credits	15
Academic level	FHEQ Level 4
Grading Schema	40

## Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

## Partner Teaching Institution

Institution Name
International College of Business and Technology

## Learning Methods

Learning Method Type	Hours
Lecture	45
Tutorial	15

## Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-PAR	PAR	January	12 Weeks

## Aims and Outcomes

Aims	Aim of this module is to provide students with an appreciation of the common scientific principles associated with environmental conditions inside buildings, and the properties and behaviour of common building materials. To enable students to apply appropriate scientific and analytical methods to investigate the internal environment in buildings and the performance and behaviour of common building materials.
------	---

**After completing the module the student should be able to:**

### Learning Outcomes

Code	Number	Description
MLO1	1	Apply appropriate scientific and analytical methods to investigate scientific problems related to the environmental conditions and processes in buildings
MLO2	2	Describe and evaluate factors which influence human comfort juxtaposed with the utility, sustainability and energy efficiency of buildings, with respect to temperature, humidity, air movement, lighting and noise levels.
MLO3	3	Identify the properties of common building materials and classify their performance characteristics, with due regard to the natural environment and potential environmental impacts
MLO4	4	Describe the thermal properties of common building structures and evaluate heat losses from simple buildings.

## Module Content

Outline Syllabus	Light; scientific properties of light, units and measurement of light, lighting levels for buildings. Artificial lighting systems and equipment; lamps & luminaires, Lumen system of lighting design, colour rendering. Use of natural light; daylight factors. Acoustics; nature of sound, nature of hearing, properties of sound (frequency, pitch, amplitude etc), measurement of sound levels, logarithms to base 10 and the decibel system. Noise in buildings; measurement of noise, noise transfer, noise control, sound insulation & absorption, attenuation. Room acoustics; reflection, absorption, reverberation. Properties of air, moisture in air, vapour, humidity and condensation. Condensation in buildings, interstitial condensation. Energy use in buildings; thermal comfort, heat losses and gains, energy balance, energy regulations. Maintenance and replacement of building components, Sustainability and environmental issues relating to procurement of materials and construction methods. Properties, design criteria and specification of a range of materials including bricks and brickwork, cement, mortar, concrete, plaster, metals, alloys, timber (including engineered timbers), clay products, insulation materials and polymers including vapour and damp-proofing barriers. Use of protective coatings including paints, stains and renders. Heat and heat transfer; radiation, conduction & convection. Thermal properties in buildings; thermal insulation, thermal capacity, thermal resistance of building components, thermal bridging. Thermal properties of common materials and structures, thermal conductivities and U values.
Module Overview	
Additional Information	

## Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Test	ONLINE MULTI CHOICE TEST	40	1.5	MLO1, MLO2, MLO3, MLO4
Portfolio	Portfolio	60	0	MLO1, MLO2, MLO3, MLO4

## Module Contacts

### Module Leader

Contact Name	Applies to all offerings	Offerings
Alison Cotgrave	Yes	N/A

### Partner Module Team

Contact Name	Applies to all offerings	Offerings
--------------	--------------------------	-----------