

Liverpool John Moores University

Title: UNDERSTANDING MATERIALS AND MIXTURES
Status: Definitive
Code: **5004APCHEM** (121132)
Version Start Date: 01-08-2021

Owning School/Faculty: Pharmacy & Biomolecular Sciences
Teaching School/Faculty: Pharmacy & Biomolecular Sciences

Team	Leader
Francesca Giuntini	Y
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Linda Seton	
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Academic Level: FHEQ5 **Credit Value:** 20 **Total Delivered Hours:** 62
Total Learning Hours: 200 **Private Study:** 138

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	55
Tutorial	5

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Exam	60	2
Presentation	Pres	Presentation	40	

Aims

The course aims at providing an overview of the relationships between solid state structures and material properties. Different classes of materials will be covered to exemplify this concept. Techniques to characterise materials (and their properties)

will be introduced. Emphasis will be placed on the synthetic approaches to inorganic, organic and composite materials.

Learning Outcomes

After completing the module the student should be able to:

- 1 Discuss and explain the concepts of materials in the context of established and emerging technologies.
- 2 Recognise the molecular bases of bulk physical properties of materials.
- 3 Recognise and identify the main classes of materials on the basis of their chemical structure.
- 4 Select and apply suitable techniques for the characterisation/analysis of modern materials.

Learning Outcomes of Assessments

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

Examination	1	2	3
Presentation	2	4	

Outline Syllabus

Introduction to Materials Chemistry. Solid state. Structure and defects of materials. Molecular, ionic, covalent, metallic solids. Crystalline and amorphous materials. Classes of Materials. Metals. Semiconductors. Ceramics and glasses. Polymers. Self-assembled materials. Composites. Biomaterials. Dispersed systems. Properties of Materials
Bulk properties of materials and their relevance for technology. Thermal, optical, electronic, mechanical, magnetic properties. Computational approaches for predicting materials properties. Manufacture and Characterisation of Materials
Application of microscopy (TEM, SEM), X-ray absorption, tomography, rheology to material characterisation. Industrial production of materials.

Learning Activities

Lecture, workshops, tutorials

Notes

With the essential nature of materials in the modern world, it is important to understand the chemistry of how these are produced and what the relationship is between chemicals and the resultant material properties. This course provides an overview of the relationships between solid state structures and material properties for a range of classes of materials. Techniques for characterisation of materials (and

their properties) will be introduced. Emphasis will be placed on the synthetic approaches to inorganic, organic and composite materials.