

Summary Information

Module Code	5001APCHEM
Formal Module Title	Radiation and Matter
Owning School	Pharmacy & Biomolecular Sciences
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Pharmacy & Biomolecular Sciences

Learning Methods

Learning Method Type	Hours
Lecture	55
Tutorial	6

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-CTY	CTY	September	12 Weeks

Aims and Outcomes

Aims	This module provides candidates with a comprehensive description of fundamental aspects of the properties and chemistry of transition metal complexes, together with a rationalization of how non-ionising radiation interacts with simple matter to produce a variety of spectra within different branches of the electromagnetic spectrum. It also outlines how quantum mechanics differ from classical theories and thus its importance at the atomic level. The kinetics of enzyme reactions is offered in detail, and how QSAR analysis can predict changes to rates of reaction.
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After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Predict the form of microwave, infrared and ultraviolet/visible spectra
MLO2	2	Discuss the toxicology of metal ions in the environment
MLO3	3	Rationalise the form and reactions of transition metal complexes, and to calculate their crystal field stabilisation energies and magnetic moments.
MLO4	4	Discuss the quantum mechanical description of matter and appreciate the difference to classical mechanics
MLO5	5	Discuss the use of QSARs in relation to enzyme kinetics

Module Content

Outline Syllabus	The following topics will be covered in this module: • Principles of co-ordination chemistry • Chemistry of the transition metals • Toxicology of metal ions • Interaction of radiation with matter • Quantum Mechanics • Enzyme kinetics • QSAR
Module Overview	In this module you will learn about quantum chemistry and how we can use its principles to describe matter and understand behaviour. You will use analytical techniques to characterise materials and learn about the different states that atoms can adopt. Following on from the main group chemistry covered in Level 4, you will study the chemistry and properties of the transition metals and apply that knowledge to learn why different metal ions show different toxicities.
Additional Information	This module is designed for semester 1 delivery only. The syllabus is supported by both standard lectures and tutorials, together with teaching materials held on Canvas and books from the standard literature. The module is assessed by one open-book comprehensive written assignment, together with one closed-book formal examination of 2 hours duration, held within 4 weeks of the module's conclusion. The pass mark is set at 40% for the whole module. There is no lower limit set for the individual components. In this module you will learn about quantum chemistry and how we use its principles to describe matter and understand behaviour. You will apply this to analytical techniques which are used to characterise materials and learn about the different states that atoms can adopt. Following on from the main group chemistry covered in level 4, you will study the chemistry and properties of the transition metals and apply that knowledge to learn why different metal ions show different toxicities.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Centralised Exam	Examination	60	2	MLO1, MLO2, MLO3, MLO4, MLO5

Report	Report	25	0	MLO1, MLO2, MLO3, MLO4, MLO5
Presentation	On-line test	15	0	MLO1, MLO2, MLO3, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Barry Nicholls	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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