UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Imaging
Module Code	CFS7028-B
Academic Year	2020/1
Credits	20
School	School of Chemistry and Biosciences
Subject Area	Chemistry
FHEQ Level	FHEQ Level 7
Pre-requisites	N/A
Co-requisites	N/A

Contact Hours	
Type	Hours
Learning Objects Interaction	11
Learning Objects Interaction	11
Practical Classes or Workshops	14
Directed Study	164
Practical Classes or Workshops	12 (online workshop)

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2

Module Aims

This module will provide you with specialist knowledge in the principles and application of microscopy, including light microscopy, confocal, atomic force, scanning electron and transmission electron microscopy, and medical imaging. This covers the history, background, fundamentals and advanced science of the different microscopical instruments. Including case studies related to major scientific breakthroughs and recent advances in instrument capabilities.

The specialist knowledge from understanding how to capture quality scientific images will then be built on by exposure to computational image processing and analysis, utilising freely available software (ImageJ). This will enable the development of programming skills in order to extract the most relevant and key experimental data analysis from images.

Outline Syllabus

Science/History of Imaging
Understanding resolution
Nature of Light:
Physics of Optics/lenses
Polarisation
Microscope components: Building own microscope
Microscopy techniques include:
Light microscope
Confocal Microscopy
Atomic Force Microscopy
Electron Microscopy (SEM/TEM)
Medical Imaging
ImageJ
Interpretation, manipulation and analysis of imaging data

Learning Outcomes

Outcome Number	Description
01	Evaluate and apply knowledge and understanding of the science of wide range of powerful research microscopes and medical imaging techniques, including analysis, capabilities and limitations.
02	Describe major advances in the subject area.
03	Analyse, interpret and critically review experimental data generated with some of the techniques.
04	Identify poor quality analytical results and suggest/apply remedial action.
05	Understand the most appropriate microscopical instrument for a wide range of materials.
06	Apply skills in problem solving and written communication.

Learning, Teaching and Assessment Strategy

The module uses a blended approach to support learning and achievement. Students will engage with a series of weekly online learning packages. These will include short videos that address key concepts, a set of structured activities (reading, online discussions etc.) that 'scaffold' the learning, and a range of formative tasks that generate feedback on progress. Online and on-campus practical sessions and workshops will provide opportunity to apply knowledge and gain experience with specialist software. Online tutorials will also be used to support learning and monitor progress as students move through the curriculum.
The assessment will be used to assess your learning and to enable you to demonstrate your problem-solving and interpretation skills.

Mode of Assessment

Type	Method	Description	Length	Weighting
Summative	Examination - Open Book	A formal open book exam covering the taught syllabus. Short questions followed by longer essay type questions.	2 hour	50%
Summative	Coursework	Coursework: Image Process Report	N/A	50%

Reading List
To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html

Please note:
This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

---

https://bradford.ac.uk