UNIVERSITY of BRADFORD

Module Descriptor

Imaging

Module Code:	CFS7028-B
Academic Year:	2018-19
Credit Rating:	20
School:	School of Chemistry and Biosciences
Subject Area:	Chemistry and Forensic Science (ceases 2016)
FHEQ Level:	FHEQ Level 7 (Masters)

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	24
Practical classes and	12
Directed Study	164

Availability Periods

Occurrence	Location/Period
BDA	University of Bradford / Semester 2 (Feb - May)

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

Module Learning Outcomes

On successful completion of this module, students will be able to...

1 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.

2 Describe major advances in the subject area.

3 Analyse, interpret and critically review experimental data generated with some of the techniques.

4 Identify poor quality analytical results and suggest/apply remedial action.

5 Understand the most appropriate microscopical instrument for a wide range of materials.

6 Apply skills in problem solving and written communication.

Learning, Teaching and Assessment Strategy

This module will be presented as a series of lectures and computer sessions. The lectures will describe the science of microscopical and medical imaging techniques used predominantly in research covering the fundamentals to recent developments. The lectures will include case studies enabling you to think across your own discipline and explore other fields. Formative progress tests will be used to revise previous content with feedback and questions from students.
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	Final Assess'
Summative	Examination - closed book	A formal exam covering the taught syllabus. Short questions followed by longer essay type questions.	2 hours	50%	Yes
Summative	Coursework	Image Processing Report. Student will submit a report with a detailed analysis of sample(s) and interpretation of experimental data	-2000 words	50%	No

Legacy Code (if applicable)

Reading List

To view Reading List, please go to **rebus:list**.