

Basic details

UID		Cohorts covered	Earliest cohort 2025-26	Latest cohort
Long title	Biomedical imaging			
New code	PHYS70031	New short title	Biomedical imaging	
Brief description of module <small>(approx. 600 chars.)</small>	<div>An introduction to principles and practice of biomedical imaging technologies, including microscopes, fluorescence and tomography. The module will provide an understanding of the challenges presented by tissue samples, in vivo and ex vivo systems. You will be equipped with sufficient knowledge to be able to use and understand a biomedical imaging system in subsequent research or industry settings and will gain knowledge of latest research frontiers.</div> <div>454 characters</div>			
Available as a standalone module/ short course?	N			

Statutory details

Credit value	ECTS 5	CATS 10	Non-credit N	HECOS codes
FHEQ level	Level 7			

Allocation of study hours

	Hours	
Lectures	12	
Group teaching	6	<i>Incl. seminars, tutorials, problem classes.</i>
Lab/ practical		
Other scheduled	10	<i>Incl. project supervision, fieldwork, external visits.</i>
Independent study	97	<i>Incl. wider reading/ practice, follow-up work, completion of assessments, revisions.</i>
Placement		<i>Incl. work-based learning and study that occurs overseas.</i>
Total hours	125	
ECTS ratio	25.00	

Project/placement activity

Is placement activity allowed?	No
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Module delivery

Delivery mode	Taught/ Campus	Other
Delivery term	Term 2	Other

Ownership

Primary department	Physics
Additional teaching departments	
Delivery campus	South Kensington

## Collaborative delivery

Collaborative delivery? N

External institution N/A  
External department N/A  
External campus N/A

## Associated staff

Role	CID	Given name	Surname
Module Leader		Mary	Matthews

## Learning and teaching

### Module description

Learning outcomes	<p>On completion of the module you will be able to:</p> <ul style="list-style-type: none"><li>-demonstrate awareness of the key techniques in imaging biological samples, and select and apply appropriate mathematical methods to the analysis of the technique,</li><li>- critically analyse key and current problems/ frontiers in biomedical imaging,</li><li>- design from first principles a biomedical imaging system, analyse its performance and assess its relative merits,</li><li>- analyse complex biomedical imaging systems using appropriate mathematical descriptions,</li><li>- describe the detail, and assess the performance characteristics and relative merits, of advanced, state-of-the-art biomedical imaging techniques.</li></ul>
Module content	<ul style="list-style-type: none"><li>• The mechanisms for creating contrast for imaging</li><li>• The principles of microscopy</li><li>• Properties of tissue and challenges for imaging in a biological content</li><li>• Design consideration and elements of a biomedical imaging system</li><li>• Using fluorescence as contrast, techniques and research examples</li><li>• Using phase as contrast, techniques and research examples</li><li>• Computational techniques for superresolution</li><li>• Advanced techniques for biomedical imaging</li></ul>
Learning and Teaching Approach	<p>Students to be taught over one term using a combination of 12 lectures to deliver the content. This will include some time for worked examples. A further 6 classworks will allow students to prepare for and present short reviews of key research papers in the field.</p>
Assessment Strategy	<p>80% summative assessment based on a 1.5 hour final written exam that will evaluate competences across the learning outcomes, 20% summative assessment will come from a 10-minute in-class journal presentation in teams (oral) with questions.</p>
Feedback	<p>Problem sheets are provided and model solutions are provided. An office hour is provided each week during the module to allow for feedback and direct interaction between students and the module lecturers. Classworks provide an opportunity for group discussion and for students to receive feedback on the presentation.</p> <p>Rapid feedback is provided via online quizzes. Students can hand in their answers to problem sheet questions which will be reviewed and annotated (no formal mark) for formative feedback.</p>
Reading list	<p>Lecture notes are provided to students as well as a list of 20-30 key papers in the field of bio-imaging. The notes are designed to be self-contained, and there is no designated textbook required for this module. There are however also some excellent textbooks, that will be suggested as supplementary or complementary reading for those wishing to explore further some aspects of the module.</p>

Quality assurance

Date of first approval	
Date of last revision	June 2024
Date of this approval	

Office use only

QA Lead	
Department staff	
Date of collection	

Module leader	Mary Matthews
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Date exported	
Date imported	

Notes/ comments	
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