

Basic details

UID	<input type="text"/>	Cohorts covered	Earliest cohort 2021-22	Latest cohort <input type="text"/>
Long title	<input type="text" value="Lasers"/>			
New code	<input type="text" value="PHYS60006"/>	New short title	<input type="text" value="Lasers"/>	
Brief description of module <i>(approx. 600 chars.)</i>	<input type="text" value="Few modern devices have had the widespread impact that lasers have in science, industry, medicine, communication, and even popular culture. This course aims to give students an quantitative understanding of the fundamentals of laser physics. It builds on their existing knowledge of electromagnetism, quantum physics, atomic physics, and optics to explain the underlying physics and operation of lasers."/>			
				403 characters
Available as a standalone module/ short course?	<input type="text" value="Y"/>			

Statutory details

Credit value	ECTS <input type="text" value="5"/>	CATS <input type="text" value="10"/>	Non-credit <input type="text" value="N"/>	HECOS codes	<input type="text"/>
FHEQ level	<input type="text" value="Level 6"/>				

Allocation of study hours

	Hours	
Lectures	<input type="text" value="16"/>	
Group teaching	<input type="text" value="0"/>	<i>Incl. seminars, tutorials, problem classes.</i>
Lab/ practical	<input type="text" value="0"/>	
Other scheduled	<input type="text" value="24"/>	<i>Incl. project supervision, fieldwork, external visits.</i>
Independent study	<input type="text" value="85"/>	<i>Incl. wider reading/ practice, follow-up work, completion of assessments, revisions.</i>
Placement	<input type="text" value="0"/>	<i>Incl. work-based learning and study that occurs overseas.</i>
Total hours	<input type="text" value="125"/>	
ECTS ratio	<input type="text" value="25.00"/>	

Project/placement activity

Is placement activity allowed?

Module delivery

Delivery mode	<input type="text" value="Taught/ Campus"/>	Other	<input type="text"/>
Delivery term	<input type="text" value="Term 2"/>	Other	<input type="text" value="Term 2, exam in term 3"/>

Ownership

Primary department	<input type="text" value="Physics"/>
Additional teaching departments	<input type="text" value="None"/> <input type="text"/> <input type="text"/>
Delivery campus	<input type="text" value="South Kensington"/>

Collaborative delivery

Collaborative delivery?

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

Associated staff

Role	CID	Given name	Surname
Module Leader		John	Tisch

Learning and teaching

Module description

Learning outcomes	Students will develop a mathematically rigorous understanding of laser physics. They will learn the basic mechanisms of laser action and how real-world lasers operate. Students will obtain an appreciation of the spatial, temporal and spectral properties of laser emission and how these properties can be controlled through the physical properties of the laser device.
Module content	The course covers key topics in laser physics including radiative transitions, line broadening, laser amplification and laser oscillation, Gaussian beams and pulsed lasers.
Learning and Teaching Approach	Students will be taught over one term using a combination of lectures, office hours, problem sheets and a number of Python programming exercises, where students will model different aspects of laser operation to develop a deeper understanding of the physics.
Assessment Strategy	100% summative assessment based on final 2-hour exam.
Feedback	Feedback will be provided via office hours, detailed model solutions to the problem sheets and programming exercises. In-lecture and Blackboard quizzes will be used to test understanding. The discussion board on Blackboard will also be used.
Reading list	Recommended texts: Laser Fundamentals by William Silfvast ISBN 9780521541053 Laser Physics by Simon Hooker and Colin Webb ISBN 0198506910

Quality assurance

Office use only

Date of first approval	<input type="text"/>
Date of last revision	<input type="text"/>
Date of this approval	<input type="text"/>

QA Lead	<input type="text"/>
Department staff	<input type="text"/>
Date of collection	<input type="text"/>

Module leader	John Tisch	Date exported	<input type="text"/>
		Date imported	<input type="text"/>

Notes/ comments

Programme structure

Associated modules

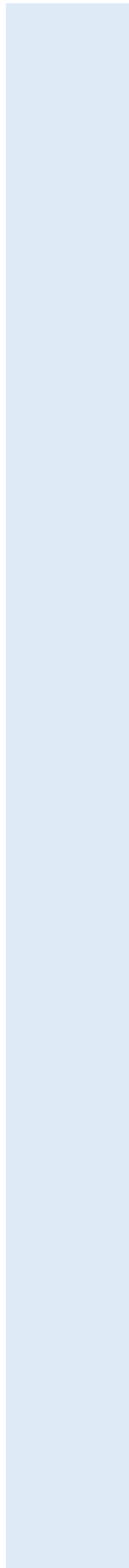
UID	Legacy code	Module title	Requisite type
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Programme structure

Associated programmes

UID	Legacy code	Programme title	Core?
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Assessment details

Grading method	Numeric	Pass mark	40%
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Assessments

Assessment type	Assessment description	Weighting	Pass mark	Must pass?
Examination	2hr Written Exam	100%	40% N	

100%