

**Laser Technology**

Module Code	PHYS97039	FHEQ Level	Level 7
Pre-requisites	Lasers	Co-requisites	None
Primary Department	Physics		
Module Leader	Professor Roland Smith + Dr Riccardo Sapienza		
Additional Teaching Departments	None		
Teaching Staff	Professor Roland Smith + Dr Riccardo Sapienza + Course Associates		
Programmes on which the Module is delivered			Core/Elective
All UG Physics programmes (F300, F303, F309, F325, F390, F3W3)			Elective
Learning Outcomes	<p>On completing the Laser Technology course, students will:</p> <ul style="list-style-type: none"> <li>• Know key laser applications and commercially important lasers;</li> <li>• Be able to match laser properties and laser systems to best fit application needs;</li> <li>• Know how to control (and in some cases, design) key laser parameters;</li> <li>• Be able to quantify some laser applications (e.g. laser cutting speed).</li> <li>• Have a rigorous but not overly mathematical understanding of nonlinear optical phenomena and contemporary applications;</li> <li>• Have an understanding of phase matching, second order nonlinear processes and the key physical concepts underlying nonlinear optics;</li> <li>• Be able to use third order nonlinearity to illustrate the process of intensity dependent refractive index and its effects (e.g. self-focussing, self-guiding, self-phase modulation)</li> </ul>		
Description of Content	<p>To provide the student with principles &amp; practice of laser device and nonlinear optical technology. The course will provide an understanding of the key physical concepts underlying laser and nonlinear optics and their contemporary applications and equip the students with sufficient knowledge to be able to use and understand lasers and nonlinear optical processes in their subsequent research or commercial careers.</p>		
Assessment		Assessment Type	Weighting
Written Exam		Exam	100%
Learning & Teaching Hours	Independent Study Hours	Placement Hours	Total Hours
47	103	0	150
ECTS Credit	6	CATS Credit	12
Date of introduction	October 2016	Date of Last Revision	April 2020