

**Graduate Studies Form for Modules attached to Structured PhD and/or Research Masters Programmes**

<b>Title</b>	Principles of Optical Design & Image Formation		
<b>Credits (ECTS)</b>	5		
<b>Module Places</b>	20		
<b>Module Code:</b>	PH506		
<b>Elective Places</b>	20		
<b>Indicative Module Descriptor:</b>			
<p>This module covers the fundamentals of optical design and image formation. The course will provide graduate students using optical systems with an in-depth knowledge of optical design. In particular, the course focuses on:</p> <ul style="list-style-type: none"> <li>Basic Concepts of Geometrical Optics</li> <li>Basic concepts of image formation</li> <li>Paraxial Optics</li> <li>Ray Tracing and Ray Aberrations</li> <li>Wave Aberrations</li> <li>Chromatic Aberrations</li> <li>Basic Principles for Aberration Correction</li> <li>Principles of Optical System Layout</li> <li>Optimization of Optical Systems</li> <li>Optimization Examples</li> <li>Synthesis of new Lens Designs</li> </ul>			
<b>Indicative Learning Outcomes:</b>			
On successful completion of this module, students should be able to:			
<ul style="list-style-type: none"> <li>• Understand basic principles of optical design</li> <li>• Develop a basic optical design for an research application in lasers and optics</li> <li>• Evaluate optical designs of commercial optical instrumentation</li> </ul>			
<b>Workload:</b> (specify or delete as appropriate)			
Class Contact (via e-learning)	20 lectures. Material also available on-line		
Workshop / tutorial	2 sessions		
Specified Assignment(s)	2 Assignments are given using ray tracing programme Review of optical design of instrumentations		
Autonomous Student Learning	Supplementary lecture material and other text and web references will be given.		
<b>Assessment(s)</b>			
Examination ?			
Test 1	<b>Type</b> MCQ	<b>% of marks</b> 0%	<b>Timing</b> Start
Test 2	MCQ	20%	Middle
Test 3	MCQ	20%	End
<b>Total MCQ</b>		<b>40%</b>	
Assessment of 2 assignments (30% each)	<b>60%</b>		
<b>Result</b>	Pass / Fail		