PH5181 - Photonics Laboratory 1

Credits: 15.0  Semester: 1  Number of Lectures: Lecturer: Dr Bruce Sinclair and others  Academic Year: 2016-17

Overview
The photonics teaching laboratory gives training in the experimental photonics, and allows students the opportunity to explore photonics practically in a series of chosen open-ended investigations. Students use their knowledge and skills from the lecture modules, supplemented by additional reading, to investigate relevant photonic effects. Phase I involves work in small groups in introductory areas, then phase II allows primarily individual investigation of topics such as the second harmonic generation, optical parametric oscillation, erbium amplifiers, Nd lasers, optical tweezers, spectroscopy, remote sensing of speed, Bragg reflectors, and holography. A formal lab report is included.

Aims & Objectives
- To give students training and experience in designing, carrying out, evaluating, and reporting on experimental aspects of photonics.
- To provide an environment where students can explore aspects of photonics.

Learning Outcomes
- A deep knowledge of photonics
- An improved ability to use experimental kit of relevance to photonics
- An improved ability to plan and use experiment, computation, and reading to explore science
- An improved ability to report and discuss aspects of experimental investigations and associated science
- An improved ability in generic skills such as planning experiments, risk assessment, record keeping, data handling and evaluation, uncertainties analysis, drawing evidence-based conclusions. Identifying useful further work.

Synopsis
- Introduction
- Guided work on exploring laser power and modes
- Guided work on key aspects of experimental optics
- Training in use of Mathematica for mathematical modelling and exploration of photonics
- Student-chosen individually-carried-out experimental investigations
- Communication of outcomes through discussion, lab books, and one formal report

Pre-requisites
Admission to a Taught Postgraduate programme within the School

Anti-requisites
None

Assessment
Coursework = 100%

Additional information on continuous assessment etc
Please see the MSc and EngD Handbook

Recommended Books
Please view University online record: http://resourcelists.st-andrews.ac.uk/modules/ph5181.html

General information
Please see information in the Handbook for Engineering Doctorate and MSc students in Photonics.