

Practical Optics: AMTC*2

An Introduction to Optics and Optical Systems

Course Dates: 5th & 6th October 2010
National University of Ireland, Galway
Room AO 208, Applied Optics Group, Arts and Sciences Building

** AMTC (Advances in Medical Technology through Convergence) is a strategic training collaboration involving the Biomedical Diagnostics Institute, DCU, the Applied Optics group, NUIG and the Regulated Software Research Group, LERO, DKIT. AMTC is part of the LifeSciences Skillnet training programme for industry.*

Objective

This two-day course is designed to provide an understanding of the basic principles of optics and optical systems for engineers and managers in industry and support agencies who may not have a background in optics. No prior knowledge of optics is required but it is recommended that attendees have a basic training in science or engineering.

Aims of the Course

The course is designed to:

- Explain the basic principles of geometrical and wave optics
- Provide an introduction to the principles of optical design
- Apply these principles to examples of optical systems.

Who Should Attend?

The course is intended for engineers and managers in industry and supporting agencies who require knowledge of optics, either for their current projects or for future product development. It is also designed for those in companies who have to interact with suppliers of components or sub-systems that contain some optical components and for those wishing to refresh their knowledge of basic optical methods.

Learning Outcomes

This course will enable you to:

- Identify suitable light sources and detectors for your application
- Choose an illumination system
- Determine image position and magnification in an imaging system.
- Choose the right stock lenses for an optical system
- Design simple layouts for an optical system
- Calculate the maximum resolution of an imaging system
- Understand the effect of optical aberrations on an image
- Test optical components
- Determine the effect of polarisation in an optical instrument

Programme

The course will run from 9:30 a.m. on Tuesday 5th October to 3:30 p.m. on Wednesday 6th October 2010, and consist of a total of 8 one-hour lectures, plus two short laboratory demonstration sessions and a networking event at the end of the first day. There will be ample opportunity to interact with the lecturing staff and other delegates during the course.

Outline Programme

Tuesday 5th Oct

9:30 Light Sources and Illumination
10:30 Basic Geometrical Optics
11:30 Break
12:00 Aberrations of Optics Systems
13:00 Lunch
14:00 Interferometry and Optical Testing
15:00 Laboratory Demonstrations
15:30 Break

16:00 Imaging and Resolution
17:00 Networking Event

Wednesday 6th Oct

9.30 Elements of Optical Design
10.30 Polarisation of Light
11.30 Break
12.00 Optical Detectors
13.00 Lunch
14.00 Lab Demonstrations
14.30 Discussion and examples (based on interest of attendees)
15.30 End of Short Course. A certificate of attendance will be provided to each participant.

Course Lecturers

Prof J C Dainty is Professor of Applied Physics at NUI Galway. He obtained his PhD from Imperial College, London and has 35 years experience in teaching and research in Applied Optics. He has received many awards for his contributions to optics, including the Mees Medal and Prize of the Optical Society of America. *Dr. N. Devaney* is a lecturer in the School of Physics. He has 15 years of experience in optical instrumentation projects for large astronomical telescopes, with responsibilities including design, testing and management. *Dr A Goncharov* is a lecturer in the School of Physics. He received his PhD from Lund Observatory, Sweden in astronomical optical instrumentation. His present fields of interest include imaging in ophthalmology and astronomy. *Dr. D Lara* obtained his PhD from Imperial College London, introducing a new polarisation sensitive imaging technique. His current work is involved with polarisation sensitive imaging in the ophthalmology and other fields.

Accommodation

There are many hotels and B&Bs in Galway, ranging from €40 per night upwards. Attendees are strongly recommend to stay overnight to allow a prompt 9:30am start to the course each day. Details of accommodation and other facilities in Galway can be found at <http://www.galway.net/>.

Location of Short Course

The course will be held in Room A0208, in the Applied Optics Group, Physics Department, NUI Galway. Campus and Galway City maps can be found at: http://optics.nuigalway.ie/visit_us

Parking

There is limited "pay and display" car parking available at NUI Galway at a rate of €6 per day. However you are strongly encouraged *not* to bring your car on campus and to walk to the Campus if at all possible.

Fee and Registration

Life Sciences Skillnet member: €480 per participant including refreshments, lunches and copy of slides and lecture material.

Non member: €600 per participant including refreshments, lunches and copy of slides and lecture material.

Book on line http://www.imda.ie/0/imda_events or e mail pauline@imdaskillnet.ie

You are advised to register as soon as possible. Places will be limited in this course to provide the best possible opportunity for the participants and lecturers to interact in a productive and informal way.



Department of Enterprise, Trade and Employment
An Roinn Fiontar, Trádála agus Fostaíochta



The Life Sciences Skillnet is funded by member companies and the Training Networks Programme, an initiative of Skillnets Ltd. funded from the National Training Fund through the Department of Enterprise, Trade and Employment.