

Physics for Biomedical Applications: AMTC*1

An introduction to physics principles for biomedical diagnostic devices.

Course Date: 26th November 2010
Biomedical Diagnostics Institute
Dublin City University, Glasnevin, Dublin 9

* 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 half-day course is designed to provide an understanding of the fundamental physics principles central to biomedical diagnostic device development for R& D Scientists, Process Engineers, Quality Engineers and Managers in industry and support agencies who may not have a background in physics. No prior knowledge of physics 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 basic physics principles relating to the development of advanced biosensors
- Use physics principles to understand the basics of fluid mechanics, optics and photonics and their application to biomedical fields
- Demonstrate the use of these principles in biomedical diagnostic device development through case-studies of BDI research including device demonstration and lab tours

Who Should Attend?

The course is intended for R& D Scientists, Process Engineers, Quality Engineers and Managers in industry and support agencies who require a knowledge of diagnostic device development, either for their current projects or for future product development. The course is particularly relevant to those in industry engaged in multidisciplinary projects focused on the optimisation or miniaturisation of diagnostic devices.

Learning Outcomes

This course will enable you to:

- Identify areas of physics which are of particular interest for your work and where more in-depth training might be useful
- Understand fluid mechanics and fluid forces and how they are utilized in microfluidic techniques for biosensors
- Gain a basic knowledge of optical principles and their use in optical biosensors
- Understand the basic principles of fluorescence and the operation and use of lasers and filters in fluorescence measurements
- Become comfortable with basic terminology in the field to allow for confident understanding of biosensors literature

Programme

The course will run from **9:30 a.m. to 1 p.m. on Friday, 26th November 2010**, and consist of a variety of short lectures and laboratory demonstration sessions and a working lunch with researchers. There will be ample opportunity to interact with the lecturing staff and with other delegates during the course.

Outline Programme

Friday, November 26th 2010

- 9:30 Overview & Introduction
- 9.45 Optics & Biosensors
- 10.20 Break
- 10.40 Fluid Mechanics & Biosensors
- 11.15 Photonics for Diagnostic Devices
- 12.15 Laboratory Demonstrations
- 1.00 Lunch with BDI researchers. *A certificate of attendance will be provided to each participant*

Course Lecturers

Prof. Brian MacCraith has his B.Sc and PhD in physics (Optical Spectroscopy of chromium-doped crystals) at NUI, Galway. He joined the staff of Dublin City University in 1986 and established the Optical Sensors Laboratory there. Since then, he has been prominent in the field of optical chemical sensors and biosensors as well as nanobiophotonics and has published widely in these areas. In October 2005, he was appointed Director of the Biomedical Diagnostics Institute (BDI; www.bdi.ie) with funding of €22.5m. The BDI is an Academic-Industrial-Clinical partnership involving over 110 researchers and is focussed on the development of next-generation Point-of-Care diagnostic platforms. In July 2010, Brian was appointed President of Dublin City University.

Dr. Christy Charlton obtained her PhD from Georgia Tech and is currently a lecturer in the School of Physics and the Biomedical Diagnostics Institute. She has taught introductory physics at a first year and masters level and also teaches an advanced course on Biophotonics. She has 10 years of experience working with lasers and optical sensing systems. Her current research at the BDI is focused on the development of fluorescence methods as analysis tools for biosensor surface coatings.

Follow-on courses

This course is the first in a series of 2 courses on diagnostic device development. The other course is a one day course which explores advances in diagnostic technology from an R & D perspective through case-study analysis.

Location of Short Course

The course will be held **in the Biomedical Diagnostics Institute, Dublin City University**. Campus maps and how to reach us can be found at: <http://www.dcu.ie/visitors.shtml>.

Parking

There is a multi-storey car park at Collins Avenue Entrance of DCU. The rate is €2 per hour.

Fee and Registration

Life Sciences Skillnet member: €120 per participant including refreshments, lunches and copy of slides and lecture material.

Non member: €150 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



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