

FlexiLearn Course Brochure

Key Enabling Technologies Workshop

Key Enabling Technologies (KETs) will be the main driving force behind the development of many future goods and services. These technologies include nanotechnology, photonics, micro- and nano-electronics, advanced materials, industrial biotechnology and advanced manufacturing. KETs are recognised by Europe to be the indispensable building blocks which will contribute to diverse value chains across the regions. Mastering these technologies is central to managing the shift towards a low-carbon, knowledge-based, economy. The technologies play an important role in the R&D, innovation and industrial strategies of many regions; they are regarded as crucial for ensuring the competitiveness of industries in the knowledge economy. A draft schedule for the week can be viewed [here](#).

Syllabus

The objective of this module is to introduce students to the concept of Key Enabling Technologies; the module will challenge students to demonstrate learning outputs in two of the six KETs identified for the workshop.

The aims of the module are:

- To demonstrate the basic principles of size effects in materials on the nano - scale and to show the impact on a range of inter-disciplinary applications in nanotechnology.
- To provide an insight into photonics and its application in current and future technologies spanning electronics, materials, and biotechnology.
- To describe the potential of large area electronics, both on a micro-and nano-scale for realising future technologies in flexible displays, organic lighting and energy harvesting.
- To convey the importance of advanced materials in future Bio and ICT technologies.
- To present an insight to bio-material interactions relevant to future biotechnologies.
- To describe the role of value chains in the realisation of advanced manufacturing.

Course Outcomes

On successful completion of this module students should be able to:

- Identify the strategic concepts behind key enabling technologies and increased competitiveness through smart specialisation.
- Summarise the fundamental concepts associated with the six key enabling technologies identified for Europe.
- Interpret the most important key enabling technologies relevant to their PhD research topic.
- Analyse the likely contribution of a specific key enabling technology to a key societal challenge.
- Synthesize and evaluate the role of key enabling technologies to their field of research.

Delivery Information

5 days block delivery at Tyndall National Institute, Cork

Assessment Information

Participating students will be required to work in groups during the course to arrive at solutions to problems thus developing their collaborative skills. Students will be presented with questions on the topics presented in the lectures and asked to prepare responses to these questions with the whole class. The module will develop the students' articulation skills and competence in conveying ideas clearly, effectively and professionally to their peers and examiners as part of the assessment process. Project work will entail writing a 4 page description of their PhD project, prepared in the context of key enabling technologies presented throughout the module. This will demonstrate high levels of competence, knowledge and critical thinking within their own areas of expertise and research topic. Each student will present a 15 minute seminar to the full class further developing articulation skills. It is expected that the module will lead to the development of new knowledge and skills and delivering findings at the frontiers of knowledge and application.

Course Details

Starting : December 5th 2016

Location : Tyndall National Institute

Category : Biotechnology, Micro & Nano-Electronics, Nanoscience and Nanotechnology, Photonics

Schedule : 5 days block delivery at Tyndall National Institute.

Weighting : 5ECTS

Course Instructor



[Prof. Jim Greer](#)

Head of Graduate Studies, Tyndall

Course Provider



Accrediting Institution

