University College Dublin
Ireland's Global University

Course code: T389

HDip in Spectroscopic Technologies & Data Analysis for Advanced Manufacturing

3 Trimester Full Time (September start)

Introduction

This multidisciplinary diploma addresses the National need for the development and deployment of advanced spectroscopic technologies and digital skills.

Although new technologies are available to provide massive and continuous data for improved process understanding and control, many industries still rely on manual acquisition and interpretation of data, due to a lack of skilled workforce. Students will develop skills in data analysis, sensors, automation and analytical technologies, which have been highlighted as key to the competitiveness of Irish industry (Manufacturing in Ireland: today, tomorrow and Beyond, Ibec, 2022).

These skills are of critical importance in mitigating against unemployment exposure within the biological, chemical, food and other advanced manufacturing industries, future proofing graduates with advanced skills in emerging technologies relevant to advanced manufacturing industries (including bioprocessing, biomaterial, advanced manufacturing industries).

Interdisciplinary Programme

This unique cross-cutting interdisciplinary programme addresses the following priority skills needs for enterprise: Advanced Spectroscopy, Good Manufacturing Practice, Quality Management in Food/Biopharma/Pharma/Materials production, Analytical Science, Industrial Instrumentation, Calibration, Statistics, Data Analytics. Big Data, Smart Manufacturing IOT and Industry 4.0.

Course Content and Structure

- The Diploma in Spectroscopic Technologies and Data Analysis for Advanced Manufacturing comprises 60 credits (20 credits earned per trimester) of Modules (11 modules). These modules are offered across the Autumn, Spring, and Summer Trimesters.
- This course is highly flexible. All lectures and tutorials occur during weekdays. Remote lectures & labs are available for those who cannot attend in person. Modules are delivered in real time to in-person students and made available online (in real time and via recordings) to off-site learners.

Modules may include:

- Sensors and Sensing Systems
- Hyperspectral imaging
- Optical Sensing Technology
- IoT enabled AgriFood Production
- Carbon Footprinting
- Biopharma Industry Regulation and Management
- Data Science for Biopharma Manufacturing
- Engineering Project Management

Why study at UCD?

Graduate education

12,800 graduate students; 17% graduate research students; structured PhDs

Global community

Over 11,000 international students from more than 152 countries

Global profile

UCD is ranked in the top 1% of higher education institutions worldwide

Global careers

Degree with high employability and dedicated careers support

Career Opportunities

Graduates with skills in Advanced Spectroscopy, Analytical Science, Instrumentation, Calibration and Data Analytics are highly sought after in the food/pharmaceutical/materials manufacturing industries. Job readiness is embedded in this programme through both credit bearing and non-credit bearing modules.

Programme Director

Professor Aoife Gowen

The process analytical technology (PAT) initiative is a key driver of adaptive processing, transforming approaches to quality assurance in manufacturing industries, leading to better process control and ultimately improved product quality. Spectroscopic technologies are recognized as a key facilitator of the PAT concept, however the big data produced by such instrumentation requires knowledge of the fundamental light-material interactions that result in a spectrum and understanding of multivariate chemometric data analysis techniques that can be utilized to gain relevant information from the measured data.

Entry Requirements

- Applicants should hold a 2.2 or higher honours degree in a STEM subject. Other disciplines and qualifications will be considered subject to an application detailing suitable mathematical, analytical, and technological skills, particularly from relevant industrial/work environment.
- Applicants will be initially screened to confirm that they satisfy the HCI Pillar 1 eligibility requirements; following this, their eligibility for the programme in terms of their educational record, skills and motivation will be assessed via CV and letter of motivation. Should more than 20 students be eligible, applicants will be ranked for admission.
- Applicants whose first language is not English must demonstrate English language proficiency of IELTS 6.5 (no band less than 6.0 in each element), or equivalent.

Tuition Fees

Tuition fee information is available on www.ucd.ie/fees. SpringBoard & HCI finding is available for this programme. Eligibility requirements and application details for this funding can found on www.springboardcourses.ie

Facilities & Resources

The School of Biosystems & Food Engineering has recently invested in excess of €1.5M in state-of-the-art facilities in sensors, spectroscopy and spectral imaging.

Related Master's Programmes of Interest

- GradDip Environmental Sustainability Implementation
- GradDip Carbon Accounting & Life Cycle Assessment

CONTACT US

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APPLY NOW

This programme receives significant interest so please apply early online at **www.ucd.ie/apply**