**University College Dublin**
Ireland's Global University

# MSc DIGITAL AGRICULTURE
## (ONE YEAR FULL-TIME / TWO YEARS PART-TIME)

The world's population is expected to grow to approx. 10 billion by 2050. This growth will result in increased demand for resources, raw materials and food. In particular, demand for food is estimated to increase by over 50% by 2050 compared to 2013. Furthermore, the world faces intersecting challenges like climate change, exploitation of natural capital and an aging and declining rural population. To produce a "sustainable food future," the world must increase food production while cutting GHG emissions and maintaining (or reducing) the land used in agriculture. Digital agriculture could address these challenges by making the agri-food value chain more efficient, equitable, and environmentally sustainable - before, during, and after on-farm production.

The programme is aimed at students and industry professionals who wish to build their knowledge and skills-base to address the complexities of developing, deploying and managing digital technology in the agriculture sector. With a focus on design, numeracy, hardware and software technology, our students will be deeply engaged with agricultural production, and specifically technology to enhance efficiency, sustainability, resilience and reliability. The modules will be part of existing final year full-time bachelor's and master's degrees and are appropriate for professionals seeking to deepen existing skills or learn brand new skill sets.

## WHY STUDY AT UCD?

### Tradition
Established 1854, with 160 years of teaching and research excellence

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

### Global community
Over 8,500 international students from over 130 countries study at UCD

### Global careers
Degrees with high employability; dedicated careers support; two-year stay-back visa (for non-EU students)

### Safety
Modern parkland campus with 24-hour security, 20 minutes by public transport from Dublin city centre

## DELIVERED BY A HIGHLY RESEARCH-INTENSIVE SCHOOL

The programme is delivered by a highly research-intensive and multi-disciplinary school – Ireland's premier agri-food related research entity with excellent networks into the agri-food industry and with a particular focus on working with industry to provide sustainable technical solutions. The school's academic staff have a major global research impact, with three professors who are among the top 1% of the most cited researchers in the world according to the latest Highly Cited Researchers list published by Clarivate.

## COURSE CONTENT AND STRUCTURE

**90 credits** taught master's    **60 credits** taught modules    **30 credits** research project

The MSc Digital Agriculture programme is delivered either in full-time (one academic year) or part-time (two academic years) formats. All autumn and spring modules are optional and must be selected in consultation with the Programme Director.

Modules include:

- Precision Agriculture
- Precision Livestock Management
- Sensors & Sensing Systems
- Optical Sensing Technology
- Hyperspectral Imaging
- Remote Sensing and GIS
- Soil Technology
- Land Use & Environment
- Principles of Crop Science

- Fundamentals of Arable Crop Production
- Root & Alternative Crop Production
- Advances in Crop Mechanization
- Computers & Electronics in Agriculture
- IoT-enabled Agri-Food Production
- Numerical Methods for Agriculture
- Programming with Python
- Advanced Data Analytics
- Machine Learning

**Research Project:** Students have the option of undertaking an applied, work related, research project in the summer trimester.

Please see online for a full list of modules.

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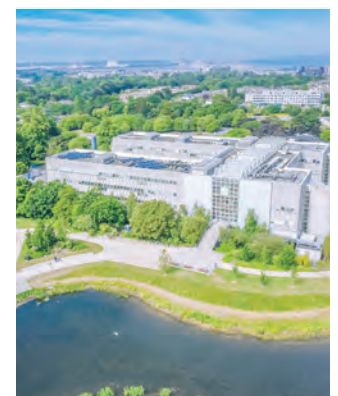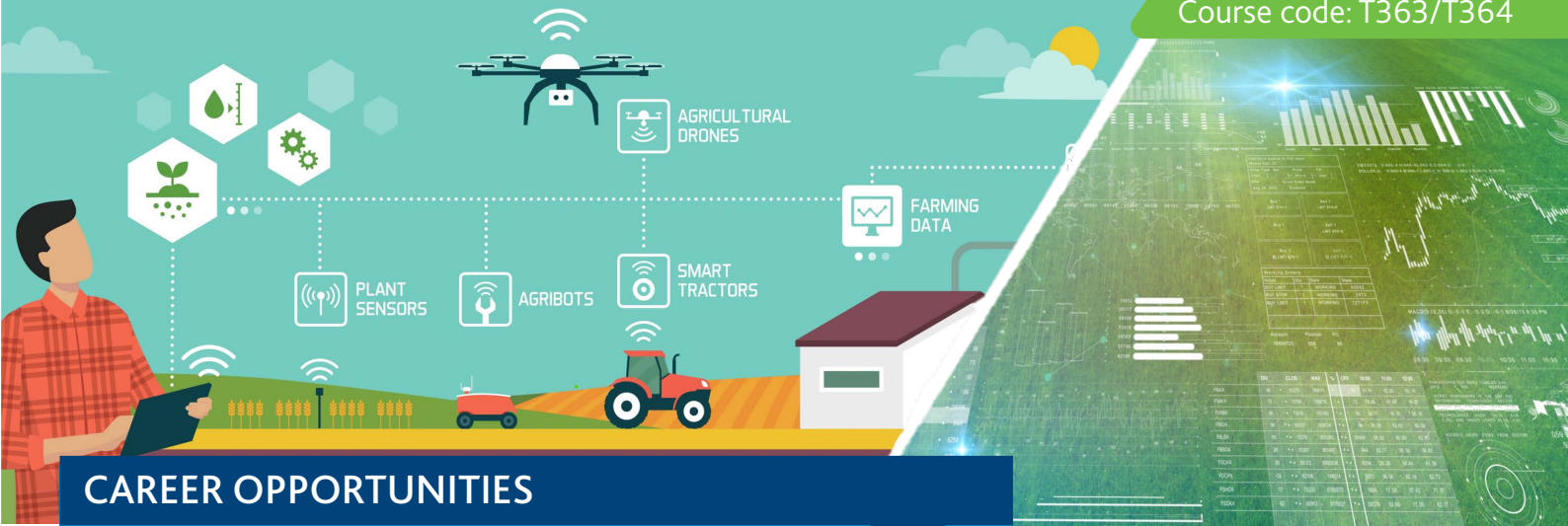
## CAREER OPPORTUNITIES

Graduates of the MSc Digital Agriculture may find employment opportunities in the following areas:

- Agricultural machinery (e.g. Agco, CNH Industrial, Claas, John Deere)
- Precision farming (e.g. Amazone, Lemken, Rauch, Dairymaster)
- Decision support in agriculture (e.g. Corteva Digital Ag, Syngenta Global)
- IoT, data and predictive analytics (e.g. BASF, Bosch, IBM, Microsoft)

## DELIVERY MODE & THEMES

The modules will be delivered either fully online, blended (i.e., online lectures and assignments supported by occasional face-to-face tutorials), and intensive (i.e., one or two week full-time) formats to facilitate easy participation by part-time learners. Students will be able to take themed clusters of modules (e.g. three modules of precision farming, three modules of sensing technology, three modules of computers and electronics, three modules of data science) to reflect specific technical interests or needs for upskilling.

## APPLY NOW

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

## ENTRY REQUIREMENTS

- A bachelor's degree with a minimum upper second-class honours (NFQ level 8) or international equivalent in agriculture, biological science, physical science, environmental related, engineering, computer science or other appropriate discipline. Where an applicant has no formal qualification encompassing agriculture/biology, practical knowledge of, and experience in, agriculture will be required.
- Applicants whose first language is not English must also demonstrate English language proficiency of IELTS 6.5 (no band less than 6.0 in each element), or equivalent.
- Other disciplines and holders of certificate and diploma qualifications will be considered subject to an application detailing suitable mathematical, technological, and analytical skills, particularly if these can be demonstrated by experience in a relevant industrial/work environment.

## SCHOLARSHIPS

- Dedicated scholarships for non-EU students
  - Apply for University Scholarship
    www.ucd.ie/global/scholarships/
  - Apply for College scholarship
    www.ucd.ie/eacollege/study/
    noneuscholarships
- Approved by US Dept of Education for federally supported loans

## WORK IN IRELAND

Option to stay in Ireland to seek employment and/or work for 2 years after graduating

## RELATED MASTER'S PROGRAMMES OF INTEREST

- MSc Environmental Technology
- MSc Sustainable Energy & Green Technologies

## FEES

Fee information is available at www.ucd.ie/fees



## PROGRAMME DIRECTOR

### Dr Dimitrios Argyropoulos

Rapid advances in computing technologies are leading to radical transformations across a multitude of industry sectors. Data analytics, machine learning, and artificial intelligence offer new solutions to challenges in sectors including agriculture. Although this degree is new within UCD, Digital Agriculture is recognised as one of the most critically important technical disciplines supporting the use of new and advanced technologies integrated into one system. The MSc programme provides students with an understanding of the tools that digitise data capture relating to the environment and activity (sensor technologies and systems), move the data (accumulation networks), store the data (databases), analyse data to gain insights (models and AI), share the resulting information along the agricultural value chain (distribution networks) and provide actors and stakeholders access to the digital chain (interfaces). The mix of full-time and part-time students sharing modules opens a promising dynamic in which learners can complement and help one another in the broader context. The modules will employ technology-enabled flexible teaching approaches suitable for both full-time students and upskilling professional learners.

## CONTACT US

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