



Program Description

Master of Science in Digitalization and Automation in Agriculture

- A second-cycle study programme that prepares specialists able to combine agricultural knowledge with digital technologies, automation, data analysis and intelligent decision-support systems.
- The programme responds to the rapid transformation of agriculture towards Agriculture 4.0/5.0, where sensors, IoT, drones, GIS, artificial intelligence, robotics and digital platforms are becoming essential for production, management and advisory services.
- It is developed within the framework of the UBT–BOKU 2030 Academic Reform and aims to modernize the academic offer in line with labour market needs, digital transformation and European integration.
- The programme is linked to the priorities of the EU Common Agricultural Policy, where knowledge, innovation, digitalization and AKIS are key elements for modernizing the agricultural sector.
- For Albania, the programme addresses a clear need: agriculture is characterized by small and fragmented farms, limited adoption of precision agriculture technologies and a shortage of specialists who understand agriculture, technology, data and automation at the same time.

Main competences acquired

Graduates of this programme will be able to:

- design and manage sensor systems, IoT solutions and monitoring networks for digital agriculture;
- use farm information management systems and decision-support systems;
- analyse agricultural data, experimental data, images, spatial data and sensor data;
- apply GIS, remote sensing, drones and imagery for monitoring soil, crops and farms;
- use the foundations of artificial intelligence, machine learning and computer vision for diagnosis, phenotyping, monitoring and decision-making;
- understand and apply principles of robotics, mechatronics and autonomous machinery in agriculture;
- evaluate technological solutions from agronomic, economic, environmental and practical perspectives;
- develop prototypes, innovation projects and solutions adapted to farms, agribusinesses, advisory services and public institutions.

Employment opportunities

Graduates may work in:

- public administration and agricultural agencies;
- public and private advisory services;
- agribusiness companies, value chains and agricultural input companies;
- agri-tech companies and technology start-ups;
- large farms, greenhouses, livestock complexes and controlled-environment production systems;
- companies providing sensors, drones, smart irrigation systems, digital platforms and precision agriculture services;
- development projects, international organizations and rural digital transformation programmes;
- research institutions, innovation laboratories and demonstration centres;
- consulting companies in agriculture, environment, GIS, land and water management, and rural development.

Professional profiles and experience

Since the programme develops a new interdisciplinary professional profile, this section may be presented through the professional roles it aims to form:

Digital Agriculture and Precision Agriculture Specialist

Able to design, implement and interpret farm monitoring systems, sensors, GIS, remote sensing, management maps and data-based decision-making processes.

Agricultural Automation and Robotics Specialist

Able to understand and manage automation systems, autonomous machinery, agricultural mechatronics, robotics and advanced technologies in greenhouses, livestock production and crop production.

Agricultural Data and Digital Systems Analyst

Able to work with Big Data, data quality, analytical models, machine learning, computer vision and decision-support systems.

Consultant for Digital Transformation in Agriculture and Rural Development

Able to support institutions, farms, companies and projects in designing, implementing and monitoring digital solutions in agriculture.

Researcher / Doctoral Candidate

Prepared to continue research in digital agriculture, automation, robotics, artificial intelligence, GIS/remote sensing, sensors and intelligent management of agricultural systems.

How is interdisciplinarity implemented in the programme?

The programme integrates agriculture, environment, information technology, engineering, data analysis, robotics, economics and innovation management. It is delivered with contributions from the Faculty of Agriculture and Environment, the Faculty of Economics and Agribusiness and the Faculty of Forestry Sciences, reflecting the need for combined training in agricultural sciences, technology and management.

Interdisciplinarity is implemented through core modules on sensors, IoT, digital platforms, statistics, data science, AI, robotics, GIS/remote sensing and digital laboratories. The programme also includes elective courses that help students complete their training according to their previous

academic background: students with an agricultural background may strengthen their technological skills, while students with an IT/engineering background may strengthen their knowledge of crop production, livestock production, mechanization, and soil and water management.

Which Bachelor programs are eligible for entering the Master Program:

- IT/Computer Science, Software Engineering, Data Science.
- Engineering / Mechanization; Mechatronics; Electrical/Mechanical Engineering.
- Agricultural Sciences and Environmental Engineering.