

Anexa 13
H.S. 34/26.03.2026
Pt aviz CA & aprobare SUO
Prorector MA, 

CURRICULUM

Valid from academic year 2025-2026

UNIVERSITY OF ORADEA

Faculty of Environmental Protection

Blended Intensive Programme (BIP)- Smart and Green Fruit Growing: Innovative Approaches for Sustainable Orchards

Duration of studies/ no. of credits- 2 weeks (blended format: virtual + onsite components) /5 credits



1. MISSION OF THE STUDY PROGRAMME (BIP)- Smart and Green Fruit Growing: Innovative Approaches for Sustainable Orchards

This 5 ECTS BIP will provide an Introduction to sustainable horticulture practices with a focus on fruit and berry production systems in the context of climate change, resource efficiency, and sustainable food systems. The programme is designed for students at Bachelor, Master or Doctoral level who wish to develop knowledge and competences applicable to modern horticultural production and research activities aligned with European sustainability priorities.

The programme integrates key topics such as mineral fertilization, fertigation techniques, sustainable orchard and viticulture systems, food chain dynamics, and marketing of horticultural products. It prioritises the understanding of current challenges in horticulture and the identification of sustainable solutions adapted to different production systems.

The aim of this programme is to provide students with fundamental knowledge and practical skills related to sustainable horticultural systems, with applicability in real-world agricultural and research contexts. The programme is designed to support the development of competences necessary for analysing production systems, applying appropriate technological solutions, and contributing to sustainable development objectives.

2. OBJECTIVES OF THE STUDY PROGRAMME (BIP)- Smart and Green Fruit Growing: Innovative Approaches for Sustainable Orchards

- Familiarization with fundamental concepts and practices related to sustainable horticulture, including fruit and berry production systems in the context of climate change and resource efficiency
- Development of knowledge regarding mineral fertilization principles and fertigation techniques applicable to different horticultural crops
- Development of awareness of sustainable orchard and viticulture systems, including their benefits, challenges, and limitations in different environmental and production conditions
- Development of skills in analysing horticultural production systems and identifying appropriate technological and sustainable solutions
- Introduction to food chain dynamics and the role of horticultural products within sustainable food systems
- Development of knowledge regarding marketing strategies and value chains for horticultural products
- Development of practical skills through field visits, case studies, and application-oriented learning activities
- Development of student transferable skills in group work, communication, and presentation
- Promotion of international collaboration and intercultural exchange among participants from different European institutions
- Support for the development of competences necessary for addressing real-world challenges in sustainable agriculture, aligned with European sustainability and Green Deal objectives

3. COMPETENCES THAT GRADUATES WILL OBTAIN UPON THE COMPLETION OF STUDIES

Professional competences

- Become familiar with:
 - Principles of sustainable horticulture and fruit and berry production systems
 - Mineral fertilization strategies and fertigation techniques
 - Sustainable orchard and viticulture systems in the context of climate change
 - Structure and functioning of horticultural food chains
 - Marketing approaches for horticultural products and value chains
 - Current challenges in horticultural production related to environmental and economic sustainability

Become aware of:

- The complexity of horticultural systems and their interaction with environmental factors
- The impact of climate change on fruit production systems and adaptation strategies
- The limitations and constraints of different fertilization and production approaches
- The role of sustainable practices in ensuring long-term productivity and environmental protection
- The importance of integrating production, processing, and marketing within the food chain

Analyze:

- Orchard systems and production technologies in different environmental contexts
- Fertilization plans and nutrient management strategies for various crops
- Sustainability performance of horticultural systems (environmental, economic, and social aspects)
- Case studies from field visits and real production systems
- Market opportunities and challenges for horticultural products

Assess:

- The suitability of different horticultural practices under specific conditions
- The efficiency and sustainability of fertilization and fertigation strategies
- The impact of technological choices on productivity and environmental outcomes
- The strengths and limitations of different production and marketing approaches
- The feasibility of solutions proposed for real-world horticultural problems

Know how:

- To approach the analysis of horticultural systems and identify key factors influencing productivity and sustainability
- To calculate and adjust fertilizer doses according to crop requirements and environmental conditions
- To interpret data and observations collected during field visits
- To develop solutions for improving sustainability in horticultural production systems
- To work collaboratively in multidisciplinary and international teams

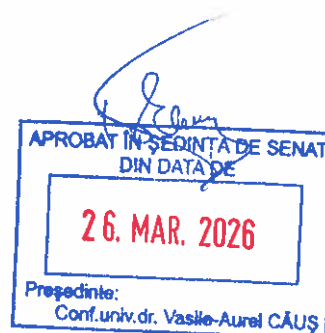
Be able to:

- Apply theoretical knowledge to practical situations in horticulture
- Analyse and propose solutions for real-life problems in fruit production systems
- Design and present a project related to sustainable horticulture
- Communicate results and arguments clearly to both specialist and non-specialist audiences
- Work effectively in teams and contribute to joint outcomes



Transversal competences

- Completion of tasks in a responsible, efficient, and ethical manner, in accordance with academic integrity principles
- Application of teamwork and communication skills in an international and interdisciplinary context
- Development of critical thinking and problem-solving abilities
- Adaptation to new learning environments and intercultural collaboration





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Department of Agriculture, Horticulture
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CURRICULUM

Module	Hours				Verification	Credits	IS [hours / sem.]
	C	S	L	P			
Module 1. Fundamentals of horticulture and orchard systems 1.1. Introduction to horticulture and fruit growing systems in Europe 1.2. Classification of fruit and berry crops and their ecological requirements 1.3. Types of orchard systems (traditional vs. intensive systems) 1.4. Current challenges in horticulture: climate change, water scarcity, soil degradation 1.5. Sustainable approaches to orchard management and resource use efficiency	4	2	-	-		1	19
Module 2. Sustainable practices and fertilization 2.1. Principles of sustainable orchard management and climate-smart agriculture 2.2. Innovations in horticulture and precision agriculture approaches 2.3. Mineral fertilization in fruit and berry crops: macro- and micronutrients 2.4. Fertilization techniques and nutrient delivery systems 2.5. Calculation of fertilizer doses for different crops and production systems 2.6. Case studies on nutrient management and sustainable fertilization strategies	6	4	-	-		1	15
Module 3. Field-based learning and applied analysis 3.1. Visits to commercial fruit plantations and observation of production systems 3.2. Analysis of orchard design, irrigation systems, and fertilization practices 3.3. Identification of sustainability challenges in real production environments 3.4. Interaction with practitioners and discussion of applied solutions 3.5. Group-based analysis and interpretation of field observations	-	-	8	-		1	17
Module 4. Sustainability, food chain and marketing of horticultural products 4.1. Sustainable orchards systems under changing climate conditions 4.2. Organic and environmentally friendly orchard management practices 4.3. Structure and functioning of the horticultural food chain 4.4. From production to consumption: value chains and supply chains 4.5. Marketing strategies for horticultural products 4.6. Consumer behaviour and market trends in sustainable food systems	4	2	-	2		1	17
Module 5. Project development, teamwork and evaluation 5.1. Formation of interdisciplinary student teams 5.2. Identification of real-world problems in horticulture 5.3. Development of project proposals addressing sustainability challenges 5.4. Application of knowledge acquired during the programme 5.5. Preparation and delivery of final presentations 5.6. Evaluation, feedback, and discussion of proposed solutions	-	2	-	6	Colocviu	1	17
TOTAL	14	10	8	8		5	85

Legend: C - Course; S - Seminar; L - Laboratory; P - Project; IS – Individual Study; Ex. – Examination

ONE CREDIT POINT REQUIRES A TOTAL OF 25 HOURS OF STUDY PROGRAM, DIDACTIC AND INDIVIDUAL ACTIVITY.

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DISTRIBUTION OF VIRTUAL AND IN PRESENCE ATTENDANCE

Module	VT	VP	PT	PP	Total	Evaluation	Credits	IS [hours / sem.]
Module 1. Fundamentals of horticulture and orchard systems								
1.1. Introduction to horticulture and fruit growing systems in Europe								
1.2. Classification of fruit and berry crops and their ecological requirements								
1.3.Types of orchard systems (traditional vs. intensive systems)	2	-	2	2	6		1	19
1.4. Current challenges in horticulture: climate change, water scarcity, soil degradation								
1.5. Sustainable approaches to orchard management and resource use efficiency								
Module 2. Sustainable practices and fertilization								
2.1. Principles of sustainable orchard management and climate-smart agriculture								
2.2. Innovations in horticulture and precision agriculture approaches								
2.3. Mineral fertilization in fruit and berry crops: macro- and micronutrients	2	-	4	4	10		1	15
2.4. Fertilization techniques and nutrient delivery systems								
2.5. Calculation of fertilizer doses for different crops and production systems								
2.6. Case studies on nutrient management and sustainable fertilization strategies								
Module 3. Field-based learning and applied analysis								
3.1. Visits to commercial fruit plantations and observation of production systems								
3.2. Analysis of orchard design, irrigation systems, and fertilization practices	-	-	-	8	8		1	17
3.3. Identification of sustainability challenges in real production environments								
3.4. Interaction with practitioners and discussion of applied solutions								
3.5. Group-based analysis and interpretation of field observations								
Module 4. Sustainability, food chain and marketing of horticultural products								
4.1. Sustainable orchards systems under changing climate conditions								
4.2. Organic and environmentally friendly orchard management practices								
4.3. Structure and functioning of the horticultural food chain	2	-	2	4	8		1	17
4.4. From production to consumption: value chains and supply chains								
4.5. Marketing strategies for horticultural products								
4.6. Consumer behaviour and market trends in sustainable food systems								
Module 5. Project development, teamwork and evaluation								
5.1. Formation of interdisciplinary student teams								
5.2. Identification of real-world problems in horticulture								
5.3. Development of project proposals addressing sustainability challenges	-	-	-	8	8	Colocviu	1	17
5.4. Application of knowledge acquired during the programme								
5.5. Preparation and delivery of final presentations								
5.6. Evaluation, feedback, and discussion of proposed solutions								
TOTAL	6	0	8	26	40		5	85

VT = virtual theory. VP = virtual practical, PT = in presence theory, PP: in presence practical.

Head of Agriculture, Horticulture Department
Conf. univ.dr.ing. Ioana Maria BORZA



DEAN,
conf. univ. dr. Cristina Maria MAERESCU



