

SOILLESS CULTIVATION SYSTEMS

COURSE OUTLINE

1. GENERAL			
SCHOOL	School of Agricultural Sciences		
ACADEMIC UNIT	Department of Agriculture		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	0810.7.018.0	SEMESTER	1st
COURSE TITLE	Soilless cultivation systems		
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course	WEEKLY TEACHING HOURS	CREDITS	
	0	5	
Total	0	5	
COURSE TYPE general background, special background, specialised general knowledge, skills development			
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS	English		
OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)			

2. LEARNING OUTCOMES	
Learning outcomes	
The module aims to provide students with both the theoretical background and practical skills required for the design, establishment, and management of modern soilless cultivation systems, with particular emphasis on hydroponic production. It covers the principles of hydroponic system design, growing substrate selection, nutrient solution formulation and management, and the application of sustainable production practices. The module is designed to equip students with the knowledge and technical competencies required to establish and efficiently operate commercial hydroponic production systems, particularly for vegetable crops. Students will be able to: • design hydroponic cultivation systems appropriate for different crops and production conditions; • select suitable growing substrates and the necessary equipment for hydroponic installations; • estimate the materials, equipment requirements, and associated costs for the establishment and operation of hydroponic production systems; • formulate, prepare, and adjust nutrient solutions according to crop nutritional requirements and environmental conditions; • diagnose and address problems related to plant nutrition and the operation of hydroponic systems; and • provide scientifically sound technical guidance to growers and other stakeholders on the design, establishment, and management of soilless cultivation systems.	
General Competences	

- Ability to search for, analyse, and synthesize scientific data and information using modern information and communication technologies.
- Application of theoretical knowledge to the design and management of hydroponic production systems.
- Evidence-based decision-making regarding the selection of growing substrates, nutrient solutions, and cultivation systems.
- Ability to work independently and collaboratively in multidisciplinary teams.
- Design and evaluation of alternative technical solutions for sustainable crop production systems.
- Development of research ideas in the field of soilless cultivation.
- Promotion of critical, creative, and inductive thinking.

3. SYLLABUS

The theoretical component is delivered through lectures supported by multimedia teaching materials. Laboratory sessions include demonstrations and hands-on training in the installation, operation, and management of different hydroponic systems, followed by the establishment and cultivation of vegetable crops using these systems to reinforce theoretical knowledge through practical application.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	Face to face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	Use of multimedia presentations and audiovisual teaching materials during lectures. Utilization of the University's Learning Management System (LMS) for the dissemination of course materials, assignments, announcements, and communication with students. Application of specialized software and digital tools for the design and management of hydroponic systems, nutrient solution formulation and evaluation, and the analysis and processing of experimental data.	
TEACHING METHODS The manner and methods of teaching are described in detail.	Activity	Semester workload
	Course total	
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure	Assessment of the theoretical component is based on a written final examination. The laboratory component is assessed through a combined written and practical examination, designed to evaluate both students' theoretical understanding and their ability to apply the techniques and methods acquired during the laboratory sessions.	

5. ATTACHED BIBLIOGRAPHY

1. Σάββας, Δ. *Καλλιέργειες Εκτός Εδάφους*. Εκδόσεις Σταμούλη, Αθήνα.
2. Sonneveld, C., & Voogt, W. (2009). *Plant Nutrition of Greenhouse Crops*. Springer.
3. Raviv, M., Lieth, J. H., & Bar-Tal, A. (Eds.). (2019). *Soilless Culture: Theory and Practice* (2nd ed.). Elsevier.

