



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Modern Growing Systems in Greenhouse							
Course Code		BB427		Course Level		First Cycle (Bachelor's Degree)			
ECTS Credit	4	Workload	100 ( <i>Hours</i> )	Theory	2	Practice	2	Laboratory	0
Objectives of the Course		The main objective of this course is to introduce modern systems and soilless culture techniques that can be used in greenhouses for vegetables and ornamental plants growing, to identify the reasons for justifications, advantages and disadvantages, applications to greenhouses and to teach the principles of plant growing in these systems, to plan and manage soilless cultivation at commercial, amateur and experimental level, to provide the solutions to students to solve the problems facing in soilless plant production.							
Course Content		Greenhouse definition, properties, comparison of simple and modern greenhouse systems, advantages and disadvantages, climitization in modern greenhouses, greenhouse automation, the definition and classification of soilless culture systems, soilless culture techniques, plant nutrition in soilless culture, preparation and application of nutrient solution, solution-Media-plant analysis , the advantages and disadvantages of soilless culture (hydroponics), environmental effect, the future.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Demonstration, Discussion, Project Based Study, Individual Study					
Name of Lecturer(s)		Ins. Leyla EKEN							

### Prerequisites & Co-requisites

ECTS Requisite	150
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### Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	70

### Recommended or Required Reading

1	Sevgican, A. Örtü altı yetiştiriciliği Cilt II
2	Gül A., 2008. Topraksız Tarım. Hasad Yayıncılık, 144 s.
3	Savvas D., Passam H. (ed.), 2002. Hydroponic Production of Vegetables and Ornamentals. Embryo Pub., Greece, 463 s.
4	Gül A., Tüzel İ.H., Okur B., Tuncay Ö., Aykut N., Engindeniz S., 2000. Serada Topraksız Tarım Tekniği ile Hıyar Yetiştiriciliği. TÜBİTAK TARP Yayınları, 51 s.

Week	Weekly Detailed Course Contents	
1	Theoretical	What is greenhouse? Classification of greenhouses, suctructurel features, What mens "modern systems" in greenhouses? To identify the use justifications of modern systems by comparing the modern greenhouses with simple ones,
	Practice	introduction of greenhouses
2	Theoretical	Giving information about modern systems in greenhouses, to identify the modern systems related to climatization as heating, lighting, moistening,
	Practice	introduction of Heating, cooling, ventilation, lighting systems,
3	Theoretical	Automation, plant growing, nutrition and irrigation systems, harvesting and packaging systems in modern greenhouses,
	Practice	introduction of Heating, cooling, ventilation, lighting systems,
4	Theoretical	Modern system for plant growing,- soilless culture-definition-the development and use of soilless culture in the world and Turkiye, advantages and disadvantages of soilless culture, classification of soilless culture systems
	Practice	introduction of soilless culture systems
5	Theoretical	Substrate culture and water culture (hydroponics), subrates and their characteristics used in soilless culture,
	Practice	A visit to a commercial modern company
6	Theoretical	Irrigation and nutrition in soilless culture, contents and preparation of nutritent solution formulations,



6	Practice	Arrangement for plant growing in substrate culture or hydroponic systems
7	Theoretical	Substrate culture-The principles, advantages and disadvantages of Bed culture,
	Practice	Plant growing in soilless culture
8	Intermediate Exam	Mid-term Exam
9	Theoretical	Bag/ Pot Soilless culture systems- The principles, advantages and disadvantages
	Practice	introduction of nutrition and irrigation systems,
10	Theoretical	Water culture (Hydroponics), water culture systems, advantages and disadvantages, principles of working of these systems, Factors to be taken into consideration during usage, (NFT-DFT)
	Practice	Preparation of nutrient solution formulations
11	Theoretical	Water culture systems (Hydroponics), advantages and disadvantages, principles of working of these systems, Factors to be taken into consideration during usage, (Flat water system)
	Practice	A visit to a company,introduction of Heating, cooling, irrigation and nutrition systems in company, computer-based applications, automated systems
12	Theoretical	Aeroponic systems, advantages and disadvantages, principles of working of these systems, Factors to be taken into consideration during usage,
	Practice	Practices at the greenhouse of department, cultural practices
13	Theoretical	Factors to be taken into consideration during plant growing in modern greenhouses,
	Practice	Harvest of crops, medium and greenhouse preparation for new session,
14	Theoretical	Environmental effects of modern growing systems used in greenhouses, comparison and evaluation of modern and simple greenhouses by economically,
	Practice	presentation of term projects
15	Theoretical	Visiting commercial company, business management systems, presentation of term projects
	Practice	presentation of term projects
16	Final Exam	Final Exam

### Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	1	2	42
Lecture - Practice	14	1	2	42
Term Project	1	6	0	6
Midterm Examination	1	4	1	5
Final Examination	1	4	1	5
Total Workload (Hours)				100
[Total Workload (Hours) / 25*] = <b>ECTS</b>				4

\*25 hour workload is accepted as 1 ECTS

### Learning Outcomes

1	To be able to recognize the greenhouses, comprehend the use purposes, comprehend the differences between modern and simple greenhouses
2	To be able to comprehend the structural features, equipments and automation of modern greenhouses, to manage and direct the climatization and automation of equipments
3	To be able to plan and recognize the soilless culture systems
4	To be able to grow plants in soilless culture
5	To be able to solve the problems facing while production in soilless culture
6	To be able to follow the new practices related to improve soilless culture, be open to innovations, and to produce solutions.

