



AYDIN ADNAN MENDERES UNIVERSITY
GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
FIELD CROPS
FIELD CROPS
FIELD CROPS MASTER
COURSE INFORMATION FORM

Course Title	Legumes and Biological Nitrogen Fixation in Sustainable Agriculture								
Course Code	ZTB542	Course Level			Second Cycle (Master's Degree)				
ECTS Credit	8	Workload	203 (Hours)	Theory	2	Practice	2	Laboratory	0
Objectives of the Course	To teach inform students about the biological nitrogen fixation in legumes, direct research on the subject.								
Course Content	Definition of sustainable agriculture, the place and importance of legumes in sustainable agriculture, microorganisms that can fix nitrogen, the importance of these bacteria in the nitrogen cycle, the properties of these bacteria, the importance of nitrogen in the production of field crops, bacterial vaccination, bacterial-plant compatibility, nodule formation.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Demonstration, Discussion								
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

Recommended or Required Reading

1	Sehirali S, 1988. Yemeklik Dane Baklagiller. Ankara Üniv. Ziraat Fak. Yayınları. Ders Kitabı: 314
2	Sepetoğlu, H. 2000. Simbiyotik Azot Tespiti. Yüksek Lisans Ders Notları. 51 s.
3	Engin M, 1989. Yemeklik Dane Baklagiller. Çukurova Üniv. Ziraat Fak. Yayınları. Ders Notları: 110
4	Özdemir S, 2006. Yemeklik Baklagiller. Hasad Yayıncılık, İstanbul-Türkiye

Week	Weekly Detailed Course Contents	
1	Theoretical	Content and purpose of the lecture, the importance of sustainable agriculture.
2	Theoretical	Sustainable agriculture system and the importance of legumes in this system
3	Theoretical	Biological nitrogen fixation and its importance
4	Theoretical	Stages of biological nitrogen fixation and related microorganisms
5	Theoretical	Properties of Rhizobium bacteria
6	Theoretical	The importance of Rhizobium bacteria in nitrogen cycle
7	Theoretical	Environmental factors affecting the success of Rhizobium bacteria in the nitrogen cycle
8	Theoretical	Midterm Exam
9	Theoretical	Bacterial vaccination techniques
10	Theoretical	Preparation of grafting material
11	Theoretical	Vaccination and sowing of seed
12	Theoretical	Count of total and active nitrogen nodules
13	Theoretical	Nodule formation, factors affecting nodule formation
14	Theoretical	Nodule formation, factors affecting nodule formation
15	Theoretical	Effects of biological nitrogen fixation on yield and product quality of legumes
16	Theoretical	Final

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	2	28
Lecture - Practice	14	0	2	28
Seminar	5	0	5	25
Term Project	2	0	30	60
Project	5	0	10	50
Midterm Examination	1	2	4	6



Final Examination	1	2	4	6
	Total Workload (Hours)			203
	[Total Workload (Hours) / 25*] = ECTS			8
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	Understanding the importance of edible legumes in sustainable agriculture
2	Effects of edible legumes on soil fertility
3	Vaccination of Rhizobium bacteria
4	Importance of Rhizobium bacteria
5	The formation of nodules in legumes

Programme Outcomes (Field Crops Master)

1	To be able to improve and deepen the level of expertise in field crops on the basis of the departments licenses qualifications.
2	To be able to recognize the subjects related to field crops, to be able to solve these and make interpretation.
3	To be able to have the skills of acting independently, to have power to decide and to create.
4	To be able to work in teams between departments
5	To be able to give briefing about latest information of Field Crops in written, oral and visual ways.
6	To be able to take responsibility for developing the new approaches and to formulate a solution facing unforeseen complex situations of applications,
7	To be able to defend the original opinions in both Turkish and in foreign languages by using these languages and communicating effectively.
8	To be able to contribute to science by producing knowledge for the aim of improving quality, efficiency and sustainability
9	To be able to apply breeding methods in order to improve new varieties for Field Crops.
10	To be able to maintain and select the appropriate statistical methods within the framework of the study, evaluation of scientific ethics; to convert the results into a report/dissertation and to offer them by producing scientific publications.

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5
P1	5	4	5	5	5
P2	5	4	5	5	5
P3	5	4	5	5	5
P4	5	4	5	5	5
P5	5	5	5	5	5
P6	5	5	5	5	5
P7	5	5	5	5	5
P8	5	5	5	5	5
P9	5	5	5	5	5
P10	5	5	5	5	5

