AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Soil Enzymes								
Course Code	ZTO618		Couse Level	Third Cycle (Doctorate Degree)					
ECTS Credit	7	Workload	172 *(Hours)*	Theory	2	Practice	2	Laboratory	0
Objectives of the Course	The aim of this course is to teach to students defining reaction mechanisms of microbial enzymes and understanding relationships between soil enzymes and soil quality.								
Course Content	Structure and classification of soil microbial enzymes, enzymes involved in phosphorus, carbon, sulphur and nitrogen-metabolism.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Experiment, Demonstration, Discussion, Case Study, Individual Study, Problem Solving								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

Recommended or Required Reading	
1	Soil Enzymes. Burns, R.G., 1978. Academic Press, London-New York-San Francisco. Shukla, G., Varma, A. 2011.
2	Selected soil enzymes; Examples of their potential roles in the ecosystem. Makoi, J.H.J.R., Ndakidemi, PA., 2008. Afrıcan J. Biotechn. 7: 181-191 .
3	Soil Microbial Ecology. Metting, F.B., Marcel Dekker, Inc. New York, Basel, Hong Kong, (1992).
4	Soil Enzymology. Springer. Berlin Heidelberg New York. Schinner, F., Öhlinger, R., Kandeler, E., Margesin, R., 1995.
5	Methods in Soil Biology. Springer. Berlin Heidelberg New York.
6	Soil Microbiology, Ecology and Biochemistry. 2006. by Eldor Alvin Paul, Elsevier Science, 552pp
7	Methods in Applied Soil Microbiology and Biochemistry. 1995. Kassem Alef, Paolo Nannipieri Academic Pres, 576 pp

Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction and historical perspective
	Preparation Work	Literature research
2	Theoretical	Structure and reaction mechanisms of soil enzymes
	Preparation Work	Literature research
3	Theoretical	The factors affecting soil enzyme activity
	Preparation Work	Literature research
4	Theoretical	Origin of enzymes in soil
	Preparation Work	Literature research
5	Theoretical	Classification of enzymes
	Preparation Work	Literature research
6	Theoretical	Enzymes involved in N-metabolism
	Preparation Work	Literature research
7	Theoretical	Enzymes involved in C-metabolism
	Preparation Work	Literature research
8	Intermediate Exam	Midterm Exam
9	Theoretical	Enzymes involved in P-metabolism
	Preparation Work	Literature research
10	Theoretical	Enzymes involved in S-metabolism
	Preparation Work	Literature research
11	Theoretical	Enzymes involved in intracellular metabolism
	Preparation Work	Literature research
12	Theoretical	Role of enzymes in soil-plant relationships.
	Preparation Work	Literature research

13	Theoretical	Role of enzymes in soil-plant relationships.
	Preparation Work	Literature research
14	Theoretical	Enzymes as indicator of soil quality
	Preparation Work	Literature research
15	Theoretical	Practice Examination
16	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	2	28
Lecture - Practice	14	0	2	28
Seminar	1	0	25	25
Laboratory	8	0	2	16
Midterm Examination	1	0	25	25
Final Examination	1	0	50	50
			Total Workload (Hours)	172
			[Total Workload (Hours) / 25*] = **ECTS**	7

**25 hour workload is accepted as 1 ECTS*

Learning Outcomes

1	Able to define structure, reactions, localizations and importance of soil enzymes
2	Able to connect between soil quality and soil microbial enzymes
3	Able to make a list of the applications affecting microbial enzyme activity
4	Capable of defining the role of soil enzymes in soil-plant relationships
5	Able to apply soil enzyme analyses and evaluate the results

Programme Outcomes *(Soil Doctorate)*

1	To be able to apply the theoretical information achieved during the graduate study
2	To be able to collect data by scientific means, to evaluate and interpret
3	To be able to update himself continuously
4	To be able to assess the convenient analytical methods during the process of the scientific study
5	To be able to put forth solutions to soil use and plant development

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	5	5	5	5
P2	4	5	5	4	4
P3	2	4	2	5	5
P4	5	5	5	4	4
P5	3	4	4	5	5