



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Carbon- Nitrogen Interactions in Metabolism of Plant Nutrition							
Course Code		ZTO617		Course Level		Third Cycle (Doctorate Degree)			
ECTS Credit	8	Workload	201 (<i>Hours</i>)	Theory	2	Practice	0	Laboratory	0
Objectives of the Course		The course coverages of the physiology of plant nutrition in terms of carbon-nitrogen interactions. After description of main concepts about the subject, a whole plant perspective on carbon-nitrogen interactions will be examined in the course.							
Course Content		Regulation of nitrate uptake at whole plant level. Responses of the nitrate uptake system to external nitrate availability. Relation between carbon and nitrogen assimilation, tissue composition and whole plant function. Photosynthetic nitrogen use efficiency in plants. Root/shoot distribution of nitrate assimilation in plants. Phloem transport, carbon and nitrogen allocation and interspecific differences in relative growth rate. The carbon and nitrogen dependence of plant development.							
Work Placement									
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Experiment, Demonstration, Discussion, Case Study, Project Based 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	A Whole Plant Perspective on Carbon-Nitrogen Interactions. J. Roy & E. Garnier (Eds). SPB Academic Publishing.(1994).
2	Plant Physiology. L. Taiz & Zeiger. Sinauer Assoc. Inc. US. (2010)
3	Principles of Plant Nutrition. 5th Edition. K. Mengel & E. A. Kirkby. ISBN-13:978-2000089.(2001)

Week	Weekly Detailed Course Contents	
1	Preparation Work	Power point presentation.
2	Theoretical	Regulation of nitrate uptake at whole plant level.
	Preparation Work	Power point presentation.
3	Theoretical	Responses of the nitrate uptake system to external nitrate availability.
	Preparation Work	Power point presentation.
4	Preparation Work	Power point presentation.
5	Preparation Work	Laboratory work.
6	Intermediate Exam	Mid-Term exam
7	Theoretical	Photosynthetic nitrogen use efficiency in plants-1
	Preparation Work	Laboratory work
8	Theoretical	Photosynthetic nitrogen use efficiency in plants-2
	Preparation Work	Laboratory work
9	Theoretical	Root/shoot distribution of nitrate assimilation in plants-1
	Preparation Work	Laboratory work
10	Theoretical	Root/shoot distribution of nitrate assimilation in plants-2
	Preparation Work	Laboratory work
11	Theoretical	Phloem transport, carbon and nitrogen allocation and interspecific differences in relative growth rate-1
	Preparation Work	Experimental Study at greenhouse
12	Theoretical	Phloem transport, carbon and nitrogen allocation and interspecific differences in relative growth rate-2
	Preparation Work	Power point presentation.
13	Theoretical	The carbon and nitrogen dependence of plant development
	Preparation Work	Experimental Study at greenhouse



14	Final Exam	Final exam
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Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	2	28
Seminar	2	0	20	40
Laboratory	6	0	3	18
Reading	6	0	5	30
Midterm Examination	1	0	35	35
Final Examination	1	0	50	50
Total Workload (Hours)				201
[Total Workload (Hours) / 25*] = ECTS				8
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes	
1	To recognize nutrition in plants
2	To recognize C-N interactions in plants in terms of plant nutrition
3	To be able to comprehend the effect of carbon-nitrogen interaction on yield
4	Evaluate new studies on the efficiency of nitrogen utilization in plants
5	To be able to search literature about the subject

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

