



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		In Vivo and in Vitro Embryogenesis							
Course Code		BİO604		Course Level		Third Cycle (Doctorate Degree)			
ECTS Credit	7	Workload	174 ( <i>Hours</i> )	Theory	2	Practice	0	Laboratory	0
Objectives of the Course		To explain the stages of embryogenesis in plants under in vivo and in vitro conditions							
Course Content		Gamet formation in angiosperms and gymnosperms, fertilization and embryogenesis events, in vitro embryogenesis, investigation of somatic embryogenesis							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), 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	Lecture notes
2	plant embryology Prof. Dr. Meral Ünal
3	In vitro embryogenesis in plants. Trevor A. Thorpe. Kluwer Academic Publishers .

Week	Weekly Detailed Course Contents	
1	Theoretical	Zygotic embryogenesis in Gymnosperms
2	Theoretical	Zygotic embryogenesis in Angiosperms I. Dicots
	Preparation Work	Article evaluation
3	Theoretical	Zygotic embryogenesis in Angiosperms II. Monocots
	Preparation Work	article evaluation
4	Theoretical	Asexual embryogenesis in vascular plants in nature
	Preparation Work	article evaluation
5	Theoretical	In vitro embryogenesis
	Preparation Work	article evaluation
6	Theoretical	Culture of zygotic embryos
	Preparation Work	article evaluation
7	Theoretical	Morphogenic aspects of somatic embryogenesis
	Preparation Work	article evaluation
8	Theoretical	Structural and developmental patterns in somatic embryogenesis
	Preparation Work	article evaluation
9	Theoretical	Physiological and biochemical aspects of somatic embryogenesis
	Preparation Work	article evaluation
10	Theoretical	Molecular biology of somatic embryogenesis
	Preparation Work	article evaluation
11	Theoretical	haploid embryogenesis
	Preparation Work	article evaluation
12	Intermediate Exam	midterm
13	Theoretical	Somatic embryogenesis in Herbaceous Dicots
	Preparation Work	article evaluation
14	Theoretical	Somatic embryogenesis in Herbaceous monocots
	Preparation Work	article evaluation
15	Theoretical	Somatic embryogenesis in woody plants
	Preparation Work	article evaluation



**Workload Calculation**

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	2	2	56
Assignment	10	3	0	30
Reading	14	0	3	42
Quiz	4	0	2	8
Midterm Examination	1	16	2	18
Final Examination	1	18	2	20
Total Workload (Hours)				174
[Total Workload (Hours) / 25*] = <b>ECTS</b>				7

\*25 hour workload is accepted as 1 ECTS

**Learning Outcomes**

1	Learns the stages of embryogenesis in plants in vivo and in vitro
2	Previously conducted research examines and comments on plant in vivo and in vitro embryogenesis
3	Uses the gained knowledge to solve problems related with plant reproduction and can plan experiments to solve problems
4	Gains ability to comment plant life and makes challenge towards new
5	Gains ability to discuss and preparation of presentation via homeworks and oral presentations given during the course.

**Programme Outcomes (Biology Doctorate)**

1	To have enough scientific background knowledge towards a specific study and research area
2	To have an ability to identify, evaluate and develop a solution for a problem on biological aspects
3	To be able to evaluate scientific observations and results of experiments using statistical analysis methods
4	To have basic skills in areas related to field of biological studies
5	To have the ability to develop cooperation with different disciplines with the high level of social communication required for studies
6	To have knowledge of technology and use of methods and means used in biological researches
7	To have an ethical understanding which will be a guide for their investigations and publications
8	For PhD; to have European Language Portfolio C1 general level language skill
9	To be able to present and discuss own research results in accordance with scientific discipline using technological tools in scientific research environments
10	To be able to detect and evaluate economic and social impacts of an own original research results
11	To be equipped with ability of carrying out independent study in biological field
12	To be able to publish at least one an international/national peer reviewed scientific paper and/or produce or interpret an original work related to biology in order to expand the frontiers of knowledge
13	To be able to develop new approaches or adaptations to be used in solving scientific and biological problems
14	To be able to develop new understanding and approaches in order to explain a new phenomenon or a biological event under investigation
15	To have abilities and experience to create new search area through inspiration gained from subject searched

**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				
P2				5	
P4		5			
P9					5
P14			5		

