PLANT EMBRYOLOGY

1	Course Title:	PLANT EMBRYOLOGY	
2	Course Code:	BYL4012	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	4	
6	Semester:	8	
7	ECTS Credits Allocated:	4.00	
8	Theoretical (hour/week):	2.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:		
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. ŞABAN GÜVENÇ	
15	Course Lecturers:		
16	Contact information of the Course Coordinator:	Doç. Dr. Şaban GÜVENÇ e-mail: saban@uludag.edu.tr 0.224.2941793 Fen Edebiyat Fakültesi, Biyoloji Bölümü, Görükle-Bursa	
17	Website:		
18	Objective of the Course:	Aim of the course in the male and female reproductive organs of flowering plants, formation, pollination, and types of embryo sac, fertilization, embryo formation and development is to inform students about. In this course, students comparative progeny of bryophytes, ferns and flowering plants; a detailed structure of Angiosperm and Gymnosperm flowers, pollen formation and morphology to shape; megaspore formation and the embryo sac forming the cell structure and function; self – sterility mechanisms; embryo formation and role in the development of tissues and types of endosperm, seed development and seed distribution mechanisms knows.	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	Ability to learn the basic concepts of plant embryology.
		2	Ability to understand the importance and the basic principles of reproduction of plants.
		3	Ability to establish and maintain the connection between biodiversity conservation and reproduction.
		4	Ability to learn the organization, function and operation of the development and structure of plant generative organs
		5	Ability to search related to Embryology database and to transfer the information from verbal or written.
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21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	Evolutionary trends of Sporophyte-Gametophyte in Plant Life Cycles. Differentiation of reproductive structures	
2	Successful adaptations to terrestrial living of seed plants. Detailed comparison of the structure of Gymnosperm and angiosperm flower.	
3	Microsporogenesis and Microgametogenesis: Androecium: Stamen, Anther Structure and Development, Meiosis, Tetrads of Microspores.	
4	Microsporogenesis and Microgametogenesis: Pollen Grain Development and Maturation, Pollen Wall Structure, Pollen Grain Viability.	
5	Megasporogenesis and Megagametogenesis: Gynoecium, Pistil Development and Structure, Structure of Angiosperm Ovule, Meiosis, Tetrads of Megaspores, Embryo Sac Development, Types of Embryo Sac	
6	The factors that determine which of the functional megaspore in tetrad of Megaspore.	
7	Pollination (Autogamy): Self-sterility (infertility self): Sporophytic and Gametophytic self sterility, Heterostyle, Dichogamy, Herkogamy.	
8	Repeating courses and midterm exam	
9	Pollination (Allogamy): pollination types, Stigma and styllus structure and function, pollen germination and pollen tube growth in situ and in vitro.	
10	Fertilization: Comparison of fertilization in Gymnosperms and angiosperms. Double Fertilization in Angiosperms, Endosperm Development, Types of Endosperm Development	
11	Embryo development: Comparison of monocot and dicot embryos.	
12	Apomixis: Types of Sporophytic and Gametophytic apomixis.	
13	Seed formation, germination and types of seed.	
14	The importance in the future and the application areas of embryology	

22	Textbooks, References and/or Other Materials:	M. CRESTI, S. BLACKMORE, J:L: Van WENT (1992); Atlas of sexual reproduction in flowering plants. R. CZAPIK (2000); Plant Embryology: Past, Present, Future. M. ÜNAL (1988); Bitki (Angiosperm) Embriyolojisi.
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00

Contribution of Term (Year) Learning Activities to Success Grade	40.00
Contribution of Final Exam to Success Grade	60.00
Total	100.00
Measurement and Evaluation Techniques Used in the Course	

24 ECTS / WORK LOAD TABLE

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	4.00	56.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	14.00	14.00
Others	0	0.00	0.00
Final Exams	1	22.00	22.00
Total Work Load			134.00
Total work load/ 30 hr			4.00
ECTS Credit of the Course			4.00

25 CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS

	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	3	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	0	5	0	3	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	5	0	2	0	0	0	0	0	0	0	0	0	0
ÖK5	0	0	0	0	0	0	0	0	5	0	4	3	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	1 very low	2 low	3 Medium	4 High	5 Very High