

AGRIGULTURAL BIOTECHONOLGY

1	Course Title:	AGRIGULTURAL BIOTECHONOLGY	
2	Course Code:	TOHZ225	
3	Type of Course:	Compulsory	
4	Level of Course:	Short Cycle	
5	Year of Study:	2	
6	Semester:	3	
7	ECTS Credits Allocated:	4.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	2.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. NAZAN DAĞÜSTÜ	
15	Course Lecturers:		
16	Contact information of the Course Coordinator:	Prof. Dr. Nazan DAĞÜSTÜ Bursa Uludağ Üniversitesi Ziraat Fakültesi Tarla Bitkileri Bölümü 16059 Görükle BURSA ndagustu@uludag.edu.tr 0224 2941518	
17	Website:		
18	Objective of the Course:	It is aimed to give the developments in the field of agricultural biotechnology and their effects on the agricultural production potential of our country . To follow new technological knowledge and applications in the field of agricultural biotechnology, to have sufficient knowledge about biotechnology and to gain experience in biotechnology applications in agriculture.	
19	Contribution of the Course to Professional Development:	To help solving problems that cannot be solved with classical breeding	
20	Learning Outcomes:		
		1	The definition, history and usage areas of agricultural biotechnology are taught
		2	Understand the importance of agricultural biotechnology in Turkey
		3	The importance and purpose of its use in agriculture and the historical development of plant biotechnology are known
		4	They learn the biotechnological methods applied in plants
		5	Have information about the washing room, the medium preparation room, the inoculation room, the incubation room, the room where the data is taken and in vitro culture laboratory organization
		6	Has knowledge about some nutrient media, which are frequently used in plant cell and tissue cultures, composition of plant nutrients and the preparation of the nutrient medium.
		7	They learn definition of sterilization in vitro cultures, sterilization methods, the different surface sterilization methods and infections after sterilization

		8	They learn in vitro tissue culture methods (embryo culture, meristem culture, haploid plant use and production, etc.)		
		9	what is the somaclonal variation, They learn variation types and genetic stability		
		10	They learns what is gene transfer in plants and knows gene transfer methods in plants		
21	Course Content:				
	Course Content:				
Week	Theoretical		Practice		
1	Aims of lesson, introduction to definitions of agricultural biotechnology and applications in general use		Examination of application methods in agricultural biotechnology		
2	Biotechnological methods, Why is agricultural biotechnology needed in plant breeding?		Description of laboratory equipments and instruments used in plant biotechnology		
3	Plant tissue culture terms, tissue culture laboratory departments		Presentation of tools and equipment used in plant tissue culture laboratory		
4	Plant tissue culture and application areas in plant breeding		Introduction of chemical substances used in the laboratory		
5	The past, present and future of biotechnology		Application areas of biotechnology		
6	Aplication of agricultural biotechnology-advantages and limitations		Student presentation		
7	What is sterilization? Why is it needed? Callus culture, Somatic embryogenesis, Somaclonal variation		Student presentation		
Activites			Number	Duration (hour)	Total Work Load (hour)
Theoretical	Haploid breeding, Anther culture, microspore culture		Student presentation 14	3.00	42.00
Practicals/Labs			14	2.00	28.00
Self study and preparation	Micropropagation and micropropagation methods, Meristem culture		Student presentation 4	2.00	8.00
Homeworks			0	0.00	0.00
Projects	In vitro preservation of gene resources, protoplast culture		0	0.00	0.00
Field Studies			0	0.00	0.00
Midterm exams	Genetically modified organisms, usage areas, advantages and disadvantages		Student presentation 1	18.00	18.00
Others			0	0.00	0.00
Final Exams	electroporation, PEG etc. gene flow techniques		1	24.00	24.00
Total Work Load					138.00
Total work load/ECTS	improvement, Genetic engineering for insect , diseases and herbicide resistance		Student presentation		4.00
ECTS Credit of the Course					4.00

22	Textbooks, References and/or Other Materials:	<p>Bitki Biyoteknoloji (Plant Biotechnology Plant tissue culture I, Genetic engineering and applications) Selçuk Üniversitesi Vakfı Yayınları. 2001. Editörler: S. Özcan, E.Gürel, M. Babaoğlu</p> <p>Moleküler Biology .Bios Scientific Publishers Limited. 1998. ISBN: 81-85617-68-6P.C. Turner,A.G. McLennan, A.D: Bates, M.R.H. White</p> <p>Quaim, M., C.E. Pray, D. Zilberman. Economic and social considerations in the adoption of Bt crops. In. Romeis, J., A.M. Shelton, G.G. Kennedy (Eds). Integration of Insect-Resistant Genetically Modified Crops with IPM Systems. Springer, Berlin, Germany. 2008; p.329-356.</p> <p>Lindsey, K. ve Janer, M.G.K, 1992. Plant Biotechnology in Agriculture. Wiley Biotechnology Series. John Wiley and Sons Ltd., England. pp. 1-241</p> <p>E. OLHAN, 2010. Modern biyoteknolojinin tarımda kullanımının politik ve ekonomik yönden değerlendirilmesi. Farklı Boyutlarıyla Genetiği Değiştirilmiş Organizmalar, 9-14.</p>
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23	Assesment
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TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	20.00
Quiz	0	0.00
Home work-project	1	20.00
Final Exam	1	60.00
Total	3	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	Bursa Uludağ University is evaluated according to the principles of the Associate and Undergraduate Education Regulation	

24	ECTS / WORK LOAD TABLE
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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	4	3	2	2	5	3	3	3	3	3	2	2	4	3	2	3
ÖK2	4	3	2	2	5	3	3	3	3	3	2	2	4	3	2	3
ÖK3	4	3	2	2	5	3	3	3	3	3	2	2	4	3	2	3
ÖK4	4	3	2	2	5	3	3	3	3	3	2	2	4	3	2	3
ÖK5	4	3	2	2	5	3	3	3	3	3	2	2	4	3	2	3
ÖK6	4	3	2	2	5	3	3	3	3	3	2	2	4	3	2	3
ÖK7	4	3	2	2	5	3	3	3	3	3	2	2	4	3	2	3

ÖK8	4	3	2	2	5	3	3	3	3	3	2	2	4	3	2	3
ÖK9	4	3	2	2	5	3	3	3	3	3	2	2	4	3	2	3
ÖK10	4	3	2	2	5	3	3	3	3	3	2	2	4	3	2	3
LO: Learning Objectives PQ: Program Qualifications																
Contrib ution Level:	1 very low			2 low			3 Medium			4 High			5 Very High			