1. Course Description

COURSE DESCRIPTION FORM	
Course Code and Title	KM472 BIOTECHNOLOGY
Course Semester	8
Catalog Description (Content) of the Course	Morphology, structure and classification of microorganisms. Industrial biotechnology. Enzyme biotechnology. Bio-energy. Environmental biotechnology.
Main Textbook	Environmental Biotechnology, A. Scragg, 1999. Copyright License Agency Ltd. London-
Supporting Textbooks	1. Microbial Biotechnology, A. N. , Glazer, H. Nikaido, 1994. Freem New York USA. 2. Environmental Biotechnology, A. Scragg, 1999. Copyright License Agency Ltd. London
Course Credit (ECTS)	4
Prerequisites of the Course (Compulsory attendance should be indicated here.)	There is no prerequisite or co-requisite for this course..
Type of the Course	Elective
Instruction Language of the Course	Turkish
Object and Target of the Course	To give information about scope and history of biotechnology. Describe the use of biotechnology in industrial areas such as food, industry and the environment (production of ethanol and biopolymer, production of enzyme and antibiotics). To discuss the importance of bioethics and biosafety consepts in biotechnology.
Learning Outcomes of the Course	Determination of the integration between the biotechnology and bioengineeringthe potential use of in related engineering areas.
Mode of Delivery	The mode of delivery of this course is face to face .
Weekly Schedule of the Course	1. Week Introduction to industrial and environmental biotechnology. 2. Week Biotechnology and biosafety. 3. Week Morphology and chemical compositionof Biotechnological cultures (bacteria, fungi, algae.). 4. Week Microbial metabolism, biomass and genetic programs 5. Week Industrial biotechnology and bioreactors. 6. Week Primary metabolic compound production (enzyme). 7. Week Secondary metabolic compound production (antibiotics and others). 8. Week Biopolimer production 9. Week Biopolimer production 10. WeekEthanolProduction 11. WeekEthanol Production 12. Week Bioremidation of heavy metals 13. Week Bioremidation of heavy metals 14. Week Project presentations.
Educative Activities *(Credit will be determined based on the time given for these activities. Should be filled carefully.)*	Theoretical Study Hours of Course Per Week Preparing Reports Preparing Presentation Presentation Mid-Term and Studying for Mid-Term Final and Studying for Final

Assessment Criteria

	Quantity	Total Contribution (%)
Midterm	2	40
Homework	3	10
Assignment		
Projects	1	10
Practice		
Quiz		
Contribution of In-term Studies to Overall Grade		60
Contribution of Final Examination to Overall Grade		40
Attendance		

Workload of the Course

Activity	Total Week Count	Weekly Duration (in hour)	Total Workload in Semester
Theoretical Study Hours of Course Per Week	14	3	42
Practicing Hours of Course Per Week			
Reading			
Searching in Internet and Library			
Designing and Applying Materials			
Preparing Reports	7	2	14
Preparing Presentation	7	2	14
Presentation	3	3	9
Mid-Term and Studying for Mid-Term	2	5	10
Final and Studying for Final	1	5	5
Other			
Total work load			94
Total work load/25			3,8
ECTS of the course			4

Course's Contribution To Program

Number	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				X	
2	Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.	X				
3	Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern	X				

			design methods for this purpose.					
		4	Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively.				X	
		5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.					X
		6	Ability to work efficiently in intra-disciplinary teams.					X
		7	Ability to work efficiently in multi-disciplinary teams;	X				
		8	Ability to work individually.				X	
		9	Ability to communicate effectively in Turkish/English, both orally and in writing; Ability to write effective reports and comprehend written reports, make effective presentations,					X
		10	prepare design and production reports, give and receive clear and intelligible instructions.	X				
		11	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.			X		
		12	Awareness of professional and ethical responsibility.					X
		13	Information about business life practices such as project management, risk management, and change management.	X				
		14	Information about awareness of entrepreneurship, innovation, and sustainable development.	X				
		15	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X		
		16	Knowledge about awareness of the legal consequences of engineering solutions.	X				
		17	Knowledge on standards used in engineering practice.	X				
Name of Lecturer(s) and Contact Information	1. Öğr.Gör.Dr.Müjgan Okur, mtelli@gazi.edu.tr							