MICROBIAL BIOTECHNOLOGY								
1	Course Title:	MICROB	IAL BIOTECHNOLOGY					
2	Course Code:	KIM5061						
3	Type of Course:	Optional						
4	Level of Course:	Third Cy	cle					
5	Year of Study:	1						
6	Semester:	1						
7	ECTS Credits Allocated:	6.00						
8	Theoretical (hour/week):	3.00						
9	Practice (hour/week):	0.00						
10	Laboratory (hour/week):	0						
11	Prerequisites:	-						
12	Language:	Turkish						
13	Mode of Delivery:	Face to f	ace					
14	Course Coordinator:	Doç. Dr.	ASLI GÖÇENOĞLU SARIKAYA					
15	Course Lecturers:	-						
16	Contact information of the Course Coordinator:	Doç. Dr. Aslı GÖÇENOĞLU SARIKAYA agocenoglu@uludag.edu.tr Bursa Uludağ Üniversitesi Fen Edebiyat Fakültesi Kimya Bölümü, Görükle-Bursa, 16059						
17	Website:							
18	Objective of the Course:	The aim of the course is to recognize microorganisms, to have information about microbial growth, microbial metabolism and primary-secondary metabolite production related to microbial biotechnology, which is used in many areas of life						
19	Contribution of the Course to Professional Development:	To recog	nize mocroorganisms and their usage.					
20	Learning Outcomes:							
		1	Understand microorganisms and their classification					
		2	Understand the metabolism and growth conditions of microorganisms.					
		3	Understand the industrial uses and techniques of microorganisms.					
		4						
		5						
		6						
		7						
		8						
		9						
		10						
21	Course Content:							
\A/	The erection	Co	Durse Content:					
VVEEK	I neoretical		Practice					
1	introduction and application areas of biotechnology	microbial						

2	Taxon identifi	omic ca cation o	tegorie of micro	es, cla porgar	ssificat nisms	tion ar	nd									
3	Metab microc	olic rea rganisr	ctions ons	occurr	ing in											
4	Microorganisms and their products used in industry															
5	Strategies and techniques used in the isolation of microorganisms used in industry															
6	Primary and secondary metabolites															
7	Pilot-scale and industrial-scale fermentation techniques															
8	Methods of growing in closed and open systems and obtaining the formed products in industry					n										
9	Obtaining antibiotics from microorganisms															
10	Obtain	ng vita	mins fr	om m	icroorg	janism	าร									
11	Obtain	ng pro	eins fr	om mi	icroorg	anism	IS									
12	Obtain	ng enz	yme fr	om mi	icroorg	anism	S									
13	Obtain	ng biop	olyme	r from	micro	organi	isms									
14	Ferme	ntation	of alco	holic I	bevera	ges										
22	Textbooks, References and/or Other Materials:						Gla Fu Ur	Glazer, A.N., Nikaido, H. Microbial Biotechnology: Fundamentals of Applied Microbiology, Cambridge University Press, 2007. Mikrobiyoloji, Nezihe Tunaali.								
Activites						Number			Duration (hour)			Total Work Load (hour)				
							-									
Theore	tical h Exam					1		40	100			3.00		ŕ	42.00	
Theore Midtern Practica	tical h Exam als/Lab	6				1		40	1 0 0 0			3.00 0.00			4 <u>2.00</u> 0.00	
Midtern Practica Self-stv	tical als/Lab	s Breper	ation			1		40	1:00 0 3:0			3.00 0.00 6.00			42.00 0.00 84.00	
Theore Practica Notern Notern Homew	tical als/Lab Wr <u>R-pf</u> vorks	s preper	ation			0		40	1.00 D 3.01 D			3.00 0.00 6.00 0.00			42.00 0.00 84.00 0.00	
Higger Practica Self-sty Homew	tical als/Lab Wyr <u>R-pr</u> vorks s	s preper	ation			0			1.00 0 1.0 1.0 0 0.00			3.00 0.00 6.00 0.00 0.00			42.00 0.00 84.00 0.00 0.00	
Higger Practica Self-sty Homew Frougerts Field St	ticel als/Lab Wr <u>k-pr</u> orks s tudies	s <u>preper</u>	ation			0		40	1.00 D 3.0 D 0.00 D			3.00 0.00 6.00 0.00 0.00 0.00			42.00 0.00 84.00 0.00 0.00 0.00	
Midtern Practica Notern Practica Notern Homew Field St Studtern	NEXam als/Lab Vorks s tudies	s preper jecper	ation			0			1.00 D 3.0 D 0.00 D 1			3.00 0.00 6.00 0.00 0.00 0.00 20.00			42.00 0.00 84.00 0.00 0.00 0.00 20.00	
Mictern Practica Notern Homew Homew Field St Stuctors	h Exam als/Lab vorks s tudies s & and	s preper	ation		-	0			1.00 0 1.00 0 0 0 1 0 0			3.00 0.00 6.00 0.00 0.00 0.00 20.00 0.00			42.00 0.00 84.00 0.00 0.00 0.00 20.00 0.00	
Midtern Practica Self-sty Homew Forefore Field St Midtern Others	Alexam als/Lab WrR-pf /orks s tudies s & and xams	s preper s	ation			2			1.do D 3.d D 0.00 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0			3.00 0.00 6.00 0.00 0.00 20.00 20.00 30.00			42.00 0.00 84.00 0.00 0.00 20.00 20.00 0.00 30.00	
Midtern Practica Self-sty Homew Field St Studies Others Field E: Total W	Alexann Alexannn Alexannnn Alexannnnn Alexannnnn Alexannnnn Alexannnnn Alexannnnn Alexannnnnn Alexannnnnnn Alexannnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnn	s preper s	ation			0			1.00 0 0 0 0 0 1 1 0 0 0 0 1 0 0			3.00 0.00 6.00 0.00 0.00 20.00 0.00 30.00			42.00 0.00 84.00 0.00 0.00 0.00 20.00 0.00 30.00 176.00 5.97	
Midtern Practica Notern Homew Field St Stuctorn Others Field St Stuctorn Total W Cotation	keren kere keren keren	s preper s ad	ation		-	0			1.00 0 3.00 0 0 1 0 0 1 0 0 0 0 0			3.00 0.00 6.00 0.00 0.00 20.00 30.00 30.00			42.00 0.00 84.00 0.00 0.00 0.00 20.00 0.00 30.00 176.00 5.87 6.00	
Midtern Practica Notern Homew Homew Field St Stuctors Others Field St Stuctors Total W Cotalse	Alexann als/Lab vorks s tudies s & and xams /ork Loa ork loa Credit c	s preper g g ad d/ 30 hr f the Co	ation		· · · · · · · · · · · · · · · · · · ·				1.00 0 1.00 0 1 0 0 1 0 0 0 0 0 0 0			3.00 0.00 6.00 0.00 0.00 20.00 30.00 30.00			42.00 0.00 84.00 0.00 0.00 20.00 20.00 0.00 30.00 176.00 5.87 6.00	
Midtern Practica Notern Homew Homew Field St Stuctors Total St Cotal St ECTS C	Alexann als/Lab vorks s tudies s & and xams /ork Loa Ork Loa Credit c	s preper get g	ourse	TRIB	BUTIC	0 2 0 0	F LE/		1.00 0 0 0 0 0 0 1 0 0 0 1 0 0 0 0 1 0			3.00 0.00 6.00 0.00 0.00 20.00 30.00 30.00 5 TO I	PROC	GRAM	42.00 0.00 84.00 0.00 0.00 0.00 20.00 0.00 30.00 176.00 5.87 6.00 ME	
Midtern Practica Self Sty Homew Fold St Studtern Others Fistal E Total W Cotatise ECTS C	Alexani Alexan	s preper ad ad d/ 30 hr f the Co 1 PQ2	ation ourse CON	TRIB		0 2 2 0 0 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0	F LEA	40 0.0 0.0 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00 0 0 0 0 0 0 1 0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 1 0	OUTC ATIO	COME	3.00 0.00 6.00 0.00 20.00 30.00 30.00 5 TO I	PQ1	GRAM	42.00 0.00 84.00 0.00 0.00 0.00 20.00 0.00 30.00 176.00 5.87 6.00 ME PQ15	PQ16
Midfern Practica Notern Homew Field St Studiern Others Field St Studiern Others ECTS C 25	Arrest and als/Lab works s tudies s & Credit c ork Loa Ork Loa Credit c PC	s preper ad 1/ 30 hr f the Co 1 PQ2 4	ation Durse CON PQ3 5	TRIE PQ4 5		0 2 2 0 0 2 2 0 0 0 2 2 0 0 0 2 0 0 0 2 0	F LEA C PQ7 5		100 0 0 0 0 0 0 0 0 0 0 0 0	OUTC ATIO PQ1 0 4	COME: NS PQ11 0	3.00 0.00 6.00 0.00 20.00 20.00 30.00 30.00 30.00 5 TO I PQ12 0	PROC PQ1 3 0	BRAM	42.00 0.00 84.00 0.00 0.00 0.00 20.00 0.00 30.00 176.00 5.87 6.00 ME PQ15 0	PQ16 0
Midfern Practica Notern Folloct Field St Studies Field St Studies Total W Cotalse ECTS (25 ÖK1 ÖK2	Arrend Ar	s preper 3 ad d/ 30 hr f the Co 1 PQ2 4 4	ation Durse CON PQ3 5 5	TRIE 5 5	BUTIC 5 5	0 2 2 9 9 7 9 7 5 5	F LE2 6 PQ7 5 5	40 (0.0 (10 (10 (0 (10 (0 (0 (0 (0 (0	1.00 0 3.00 0	OUTC ATIO PQ1 0 4	COME: NS PQ11 0	3.00 0.00 0.00 0.00 20.00 0.00 30.00 30.00 30.00 5 TO I PQ12 0	PROC PQ1 3 0	PQ14 0	42.00 0.00 84.00 0.00 0.00 0.00 20.00 0.00 30.00 176.00 5.87 6.00 ME PQ15 0 0	PQ16 0
Midfern Practica Sielfisty Homew Folgerts Field St Studies Field St Studies Field St Studies Field St Studies Field St Studies Field St Studies Field St Studies Field St Studies Stud	Arrest and als/Lab Arrest and als/Lab /orks s tudies s s s s s c credit c Credit c Credit c A A 4 4	s preper ad 4/ 30 hr f the Co 1 PQ2 4 4 4 4	ation Durse CON PQ3 5 5 5 5	TRIE 5 5 5		0 2 2 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	F LE 6 PQ7 5 5 5	40 0 (10 (10 (10 (10 (10 (10 (10 (1.00 0	OUTC ATIO PQ1 0 4 4 4	PQ11 0 0	3.00 0.00 0.00 0.00 20.00 0.00 30.00 30.00 X TO I PQ12 0 0	PQ1 3 0 0	PQ14 0 0	42.00 0.00 84.00 0.00 0.00 0.00 20.00 176.00 5.87 6.00 ME PQ15 0 0 0	PQ16 0 0 0

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