	ROBOT DE	SIGN	AND APPLICATIONS				
1	Course Title:	ROBOT	DESIGN AND APPLICATIONS				
2	Course Code:	BMB401	9				
3	Type of Course:	Optional					
4	Level of Course:	First Cyc	le				
5	Year of Study:	4					
6	Semester:	7					
7	ECTS Credits Allocated:	5.00					
8	Theoretical (hour/week):	3.00					
9	Practice (hour/week):	0.00					
10	Laboratory (hour/week):	0					
11	Prerequisites:	None					
12	Language:	Turkish					
13	Mode of Delivery:	Face to f	face				
14	Course Coordinator:	Dr. Ögr.	Üyesi CEYDA NUR ÖZTÜRK				
15	Course Lecturers:						
16	Contact information of the Course Coordinator:	ceydanur@uludag.edu.tr					
17	Website:						
18	Objective of the Course:	To teach kinematic calculations, trajectory planning, and various control methods for designing robots of manipulator or rover type. To have theoretical information and functions of different sensors and actuators comprehended with applications to be developed on available robotic systems.					
19	Contribution of the Course to Professional Development:						
20	Learning Outcomes:						
		1	Being able to perform forward or inverse position calculations for different robot configurations				
		2	Being able to perform forward or inverse velocity calculations through differential analysis				
		3	Knowing techniques that are used for trajectory planning and motion, velocity, or force control				
		4	Having knowledge about types and functions of sensors and actuators				
		5	Being able to program robotic systems using proper interfaces				
		6	Being able to develop controller software for a robotic system to run in real-time				
		7					
		8					
		9					
		10					
21	Course Content:	_	•				
		burse Content:					
Week			Practice				
1	common robot configurations	eas,					

2	modelii represe matrice	eous c nsform	coordin	ates a with	Ind											
3	Forward and inverse kinematics for common robot configurations															
4	Progra of robo	nt rob stem	ots wit	h inter	faces											
5	Denavi and inv	repres cs	sentatio	on of f	orwarc											
6	Differei inverse	Differential motion analysis, forward and inverse Jacobian calculations														
7	Dynam	c analy	vsis an	d forc	es											
8	Path ar plannin points	id trajeo g with h	ctory p nigh-or	lannir der po	ng, trajo olynom	ectory nials a	nd via									
9	Motion proport control	velocit onal, ir ers	y, and ntegral	force , and	contro derivat	ol, ive										
10	Vision-	based o	control	meth	ods											
11	Fuzzy l	ogic-ba	sed co	ontrol	metho	ds										
12	Sensor pressu scanne	Sensors: position, velocity, acceleration, pressure, light and proximity sensors, range scanners and camera systems														
13	Actuato	rs: hyd	raulic	and p	neuma	tic dev	vices,									
Activites							1	Number			Duration (hour)			Total Work Load (hour)		
Theore Materials:							Sy	Systems, Applications, I				e Hall.				
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ÖK5	3	1	4	5	3	5	3	3	4	3	1	0	0	0	0	0
ÖK6	5	3	5	5	4	5	3	3	3	3	1	1	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contrib 1 very low ution Level:			2 low			3 Medium		4 High			5 Very High					