INTR.TO ROB.

1	Course Title:	INTR.TO ROB.
2	Course Code:	END3244
3	Type of Course:	Optional
4	Level of Course:	First Cycle
5	Year of Study:	3
6	Semester:	6
7	ECTS Credits Allocated:	3.00
8	Theoretical (hour/week):	2.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	English
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Doç.Dr. ALI YURDUN ORBAK
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	orbak@uludag.edu.tr, 0(224)2942086, Uludağ Üniversitesi Endüstri Mühendisliği Bölümü Oda Y315 Görükle, 16059, Bursa
17	Website:	http://endustri.uludag.edu.tr/~orbak/END3244.html
18	Objective of the Course:	General information on robots and robotics, motion control system and choosing robot motors, position sensing and measurement, robot kinematics and homogeneous transformation matrices (Denavit-Hartenberg notation and parameters), robot statics, dynamics, control and programming issues will be taught. Additionally, industrial robot programming, work-time diagrams, and economic analysis of robots will be examined by the students.
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	
	1	Students will grasp the movement, control and work-time scheduling of robots with various structure.
	2	Students will be able to choose motors and measurement sensors for manipulators.
	3	Students will be able to perform the economic analysis of robot applications.
	4	
	5	
	6	
	7	
	8	
	9	
	10	

21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	General informaton on robots and robotics (What is a robot, various robot types, etc.)	
2	Motion control system	

3	Position measurement	
4	Robot kinematics and homogeneous transformation matrices	
5	Denavit-Hartenberg notation	
6	Denavit-Hartenberg parameters	
7	Robot statics and Dynamics	
8	Robot control: Position control	
9	Robot control: Velocity control	
10	Robot programming	
11	Work-time diagrams	
12	Principles of robot design	
13	Economic analysis of robots	
14	Special topics in robotics (vision, hearing, etc.)	

22	Textbooks, References and/or Other Materials:	• K. S. Fu, R. C. Gonzales ve C. S. G. Lee, “Robotics: Control, Sensing, Vision and Intelligence”, McGraw-Hill Book Company, 1987. ISBN: 0-07-022625-3. • H. Asada ve J. J. Slotine, “Robot Analysis and Control”, John Wiley and Sons, 1985. • L. Sciavicco ve B. Siciliano, “Modeling and Control of Robot Manipulators”, McGraw-Hill Companies, Inc., 1996. • A. J. Chipperfeld ve P. J. Fleming, “Matlab Toolboxes
23	Assesment	

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		12	5.00	60.00
Homeworks		0	0.00	0.00
Projects		0	0.00	0.00
Midterm Exam	1	40.00		
Field Studies		0	0.00	0.00
Midterm exams		1	1.00	1.00
Home work-project	0	0.00		
Others		0	0.00	0.00
Final Exams		1	1.00	1.00
Total	2	100.00		
Total Work Load				90.00
Total work load / 30 hr				3.00
ECTS Credit of the Course				3.00

Total	100.00
Measurement and Evaluation Techniques Used in the Course	

24	**ECTS / WORK LOAD TABLE**

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	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0

ÖK3	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications					
Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**