

OSTIM TECHNICAL UNIVERSITY COMPUTER ENGINEERING

ELEC3 ROBOTICS AND ROBOT AUTONOMY

ELEC3 Robotics And Robot Autonomy

Course Name	Course Code	Term	Hour	Practice	Lab	Credit	ECTS
Robotics And Robot Autonomy	CENG	7	4	0	0	4	4

Language of the Course	English
Type of Course	Compulsory
Course Level	Undergraduate
Method of Teaching	Face-to-face, online
Instructor	
Course Learning and Teaching Techniques	Lecture, Homework, Project

Purpose of the Course

The aim of this course is to provide students will have basic knowledge on fundamental concepts of robotics including kinematics, statics, dynamics and control principles of robot manipulators.

Learning Outcomes

Students who successfully complete this course will;

- explain fundamentals of robotics
- learn dynamic principles
- describe different coordinate frames of robot manipulators
- analyse dynamic equations of robot manipulators
- describe general methods in controlling the motion of robot manipulators

Course Content

Provides basic knowledge on fundamentals of robotics such that robot kinematics, robot statics, robot dynamics, robot motion and control principles.

Weekly Plan and Related Preparation Studies					
Week	Subjects				
1	Introduction to Robotics System				
2	Actuators and Drives				
3	Control Components				
4	Control Software - 1				
5	Control Software - 2				
6	Sensors - 1				



7	Kinematics - 1
8	Midterm
9	Kinematics - 2
10	Differential Motion - 1
11	Statics, Energy Method
12	Hybrid Position-force Control
13	Compliance, End-effecter Design
14	Computer Vision
15	Project Presentations
16	Project Presentations

Resources (Textbook and supplementary book)

Springer Handbook of Robotics, Bruno Siciliano (Editor), Oussama Khatib (Editor).
Robotics, Vision, and Control: Fundamental Algorithms in MATLAB, Peter Corke, Springer.

Evaluation System					
Studies	Number	Contribution			
Attendence					
Lab					
Application					
Field Study					
Course Specific Internship (if applicable)					
Quizzes/Studio/Critical					
Homework					
Presentation	1	% 20			
Projects	1	% 50			
Report					
Seminar					
Midterm Exams/Midterm Jury	1	% 30			
General Exam/Final Jury					
	Total	% 100			
Contribution of Mid-Semester Studies to Success Grade		% 40			
Contribution of End of Semester Studies to Success Grade		% 60			
	Total	% 100			

Course Category				
Basic Vocational Courses				
Specialization/Field Courses	х			
Support Lessons				
Communication and Management Skills Lessons				
Transferable Skills Lessons				

Course Learning Outcomes and Program Qualifications							
No Brogram Qualifications / Quitcomos			Contribution Level				
NO			2	3	4	5	
1	To have adequate knowledge in Mathematics, Mathematics based physics,						
	statistics and linear algebra and engineering; to be able to use theoretical				х		
	and applied information in these areas on complex engineering problems.						
2	To be able to select and apply proper analysis and modeling methods for				v		
	solving engineering problems.				X		



3	To be able to design a thermal and mechanical system, process, device or product under realistic constraints and conditions, in such a way as to meet the requirements; to be able to apply modern design methods for this purpose.		x	
4	To be able to devise, select, and use modern techniques and tools needed for analysis and solution of complex problems in engineering applications.		x	
5	To be able to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems		x	
6	To be able to work efficiently in multi-disciplinary teams; to be able to work individually.			x

ECTS/Workload Table						
Activities	Count	Duration (Hours)	Total Workload			
Lesson hours (Including the exam week: 16 x total lesson hours)	16	2	32			
Lab						
Application						
Course Specific Internship						
Field Study						
Out of Class Study Time						
Presentation/Seminar Preparation						
Projects	1	40	40			
Reports						
Homeworks						
Quizzes/Studio Critic						
Preparation Time for Midterm Exams/Midterm Jury	1	40	40			
Preparation Time for the General Exam/General Jury						
Total Workload			102			