COURSE INFORMATON					
Course Title	*Code*	*Semester*	*C +P + L Hour*	*Credits*	*ECTS*
Control of Robotic Systems	EE 585	Fall/Spring	3+0+0	3	10

Prerequisites	-------

Language of Instruction	English
Course Level	Master's
Course Type	Elective
Course Coordinator	Prof. Dr. Duygun Erol Barkana
Instructors	Prof. Dr. Duygun Erol Barkana
Assistants	------
Goals	The course provides students with robotic and control basic definitions, the basic analysis of robot control
Content	Introduction, robot building blocks (code and electronics), control methods

Learning Outcomes	**Program Outcomes**	**Teaching Methods**	**Assessment Methods**
1) Ability to recognize, repeat and recall the mathematical foundations related to robotic and control systems,	1,2,6	1, 3, 6	E
2) Ability to model the controller for robotic systems,	1,2,6	1, 3, 6	E
3) Ability to simulate control of robotic systems using software programs,	1,2,6	1, 3, 6	E
4) Ability to define the controller for robotic systems and evaluate the responses of these systems in time domain	1,2,6	1, 3, 6	E

Teaching Methods:	1: Lecture, 2: Problem Solving, 3: Simulation, 4: Seminar, 5: Laboratory, 6: Term Research Paper
Assessment Methods:	A: Exam, B: Quiz, C: Experiment, D: Homework, E: Project

COURSE CONTENT

Week	Topics	Study Materials
1	Introduction to Robotics and Control Methods	---
2	Exploring Robot Building Blocks – Code and Electronics	---
3	Exploring Robot Building Blocks – Code and Electronics	---
4	Exploring Robot Building Blocks – Code and Electronics (Term Paper)	---
5	Building a Robot and Choosing a Controller	---
6	Building a Robot and Choosing a Controller	---
7	Building a Robot and Choosing a Controller (Term Paper)	---
8	Implementation of the Controller for the Robotic System	---
9	Implementation of the Controller for the Robotic System	---
10	Implementation of the Controller for the Robotic System (Term Paper)	---
11	Development of the System in Real-Time	---
12	Development of the System in Real-Time	---
13	Development of the System in Real-Time	---
14	Project Presentation and Final Paper	---
15	Project Presentation and Final Paper	---

RECOMMENDED SOURCES	
Textbook	Learn Robotics Programming, Danny Staple, 2nd Edition, Packt, 2021.
Additional Resources	Introduction to Robotics Mechanics and Control, John Craig, 3rd Edition, Prentice Hall

MATERIAL SHARING	
Documents	Publications related to the robotic and control systems, notes on the web.
Exams	----
Quiz	----

ASSESSMENT		
IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**

Term Papers	3	60
Final Paper	1	40
Total		**100**
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE (Project)	1	40
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE	3	60
Total		**100**

COURSE CATEGORY	Expertise/Field Courses

COURSE'S CONTRIBUTION TO PROGRAM						
No	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Can reach information in breadth and depth, and can evaluate, interpret and apply this information to scientific research in the area of Electrical and Electronics Engineering.					x
2	Can complete and apply information with scientific methods using limited or missing data; can integrate information from different disciplines.				x	
3	Sets up Electrical and Electronics Engineering problems, develops and implements innovative methods for their solutions.					
4	Develops new and/or original ideas and methods; finds innovative solutions to the system, component, or process design.					
5	Has comprehensive knowledge about the state-of-the-art techniques and methods in Electrical and Electronics Engineering and their limitations.					
6	Can design and conduct research of analytical, modeling or experimental orientation; can solve and interpret complex cases that come up during this process.				x	
7	Can communicate verbally and in writing in one foreign language (English) at the General Level B2 of the European Language Portfolio.					
8	Can assume leadership in multi-disciplinary teams; can develop solutions in complex situations, and take responsibility.					
9	Can systematically and openly communicate in national and international venues the proceedings and conclusions of the work he/she performs in Electrical and Electronics Engineering.					
10	Respects social, scientific and ethical values in all professional activities performed during the collection, interpretation and announcement phases of data.					
11	Is aware of new and emerging applications in Electrical and Electronics Engineering; investigates and learns them, whenever necessary.					
12	Can identify the social and environmental aspects of Electrical and Electronics Engineering applications.					

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration	15	3	45
Hours for off-the-classroom study (Pre-study, practice)	15	10	150
Term Paper	3	6	18
Final Project	1	25	25
Total Work Load			238
Total Work Load / 25 (h)			9.52
ECTS Credit of the Course			10