Course name: ECE519 - Robotics				**Department:** Electronics and Communications Engineering				
Semester	**Methods of Education**							**Credit (ECTS)**
	Lecture	Recitation/ (Etud)	Lab	Project/Field Study	Homework	Other	Total	7,5
1	42	28		40	60	15	185	
Language	English							
Compulsory/Elective	Elective							
Prerequisites	None							
Course Contents	Evolution of robots, elements of robotic systems, manipulator mathematics, homogeneous transformations, end-effector position and orientation, kinematics, inverse-kinematics, differential changes, task and path planning, manipulator dynamics, robot control, image processing in robotic systems.							
Course Objectives	To gain the ability to research on robotic area and to provide industrial robot systems.							
Learning Outcomes and Competences	After taking this course, students will be able to understand: Elements of robotic systems, Application of manipulator mathematics on robot systems, Robot direct kinematics and inverse kinematics, Usage of manipulator dynamics equation, Fundamentals of robot techniques and programming, Robot sensors, Image processing in robot systems.							
Textbook and /or References	1. K.S. Fu, R.C. Gonzalez, C.S.G. Lee, Robotics Control, Sensing, Vision, and Intelligence, McGraw-Hill; (1987). 2. John J. Craig, Introduction to Robotics: Mechanics and Control (3rd Edition), Prentice-Hall, 2004. 3. Mark W. Spong, Seth Hutchinson, M. Vidyasagar, Robot Modeling and Control, Wiley, 2005 4. Reza N. Jazar, Theory of Applied Robotics: Kinematics, Dynamics, and Control (2nd Edition), Springer, 2010.							
Assessment Criteria			**If any, mark as (X)**	**Percentage (%)**				
	Midterm Exams		X	30				
	Quizzes							
	Homeworks		X	20				
	Projects		X	20				
	Term Paper							
	Laboratory work							
	Other							
	Final Exam		X	30				
Instructors	Assoc. Prof. Dr. Hüseyin Canbolat							
Week	**Subject**							
1	Evolution of robots							
2	Elements of robotic systems							
3	Manipulator mathematics							
4	Homogeneous transformations							
5	End-effector position and orientation							
6	Kinematics, Inverse-kinematics							
7	Differential changes							
8	Task and path planning							
9	Manipulator Dynamics							
10	Sensors and communication							
11	Robot control							
12	Robot control (nonlinear techniques)							
13	Image processing in robotic systems.							
14	Project, Homework							