AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Robotics								
Course Code	MME512		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	195 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The aim of this course is to teach the Fundamentals of Robot technology and Robot design.								
Course Content	Introduction, Clasification of robots, robot arm kinematics ve dynamics, Trajectory generation in robots, robot control, Sensörs, robot programming languages.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Project Based Study, Individual Study, Problem Solving								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	15
Final Examination	1	60
Quiz	4	15
Assignment	5	5
Term Assignment	1	5

Recommended or Required Reading	
1	Reza N. Jazar, “Theory of Applied Robotics: Kinematics, Dynamics, and Control” Springer; 2nd ed. edition (July 1, 2010) ISBN-10: 1441917497 ISBN-13: 978-1441917492.
2	David Cook, “Robot Building for Beginners (Technology in Action)” Apress; 2nd edition (January 6, 2010), ISBN-10: 1430227486 ISBN-13: 978-1430227489.
3	Maja J. Matari, “The Robotics Primer (Intelligent Robotics and Autonomous Agents)” The MIT Press (September 30, 2007) ISBN-10: 026263354X ISBN-13: 978-0262633543.

Week	Weekly Detailed Course Contents	
1	Theoretical	Robotics and robotic manipulators
2	Theoretical	Rotation matrices
3	Theoretical	Homogeneous transformations
4	Theoretical	Direct and inverse kinematics
5	Theoretical	Direct and inverse kinematics
6	Theoretical	Jacobian matrix
7	Theoretical	Velocity and acceleration analyses
8	Intermediate Exam	Midterm Exam
9	Theoretical	Dynamic force analysis via Newton-Euler formulation
10	Theoretical	Motion equations
11	Theoretical	Motion equations
12	Theoretical	Trajectory planning
13	Theoretical	Independent joint control with computed torque method
14	Theoretical	Compliant motion control
15	Theoretical	Hybrid control with position and force feedbacks
16	Final Exam	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	16	2	4	96
Assignment	5	0	3	15
Term Project	1	15	10	25
Quiz	4	4	1	20

Midterm Examination	1	15	2	17
Final Examination	1	20	2	22
			Total Workload (Hours)	195
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To be able to explain about fundamentals of robotic science
2	To be able to comment on robot kinematics
3	To be able to comment on robot dynamics
4	To be able to generate robot trajectory
5	To be able to comment on robot control
6	To be able to compare algorithms of robot control
7	To be able to classify robot sensors

Programme Outcomes *(Mechanical Engineering Master's Without Thesis)*	
1	To be able to access wide and deep information with scientific researches in the field of Engineering, evaluate, interpret and implement the knowledge gained in his/her field of study
2	To be able to complete and implement “limited or incomplete data” by using the scientific methods
3	To be able to consolidate engineering problems, develop proper method(s) to solve and apply the innovative solutions to them
4	To be able to develop new and original ideas and method(s), to develop new innovative solutions at design of system, component or process
5	To be able to gain comprehensive information on modern techniques, methods and their borders which are being applied to engineering
6	To be able to design and apply analytical, modeling and experimental based research, analyze and interpret the faced complex issues during the design and apply process
7	To be able to gain high level ability to define the required information and data
8	To be able to work in multi-disciplinary teams and to take responsibility to define approaches for complex situations
9	To be able to transfer of the process and results of studies at national and international environments systematic and clear verbal or written
10	To be able to become aware of social, scientific and ethical values guarding adequacy at all professional activities and at the stage of data collection, interpretation, and announcement
11	To be able to become aware of new and developing application of profession and ability to analyze and study on those applications
12	To be able to gain ability to interpret engineering application’s social and environmental dimensions and it’s compliance with the social environment

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5	L6	L7
P1	3	4	5	4	3	5	4
P2	3	4	4	3	4	4	4
P3	4	4	4	4	4	4	4
P4	3	3	5	3	3	5	4
P5	3	3	5	3	3	5	4
P6	4	4	5	4	4	5	4
P7	4	4	5	4	4	4	5
P8	5	3	5	5	3	4	4
P9	4	5	5	4	5	4	4
P10	4	5	5	4	5	4	4
P11	5	5	5	5	5	4	4
P12	3	3	5	3	3	4	4