

DEPARTMENT OF MECHATRONIC ENGINEERING
COURSE SYLLABUS

Course Details					
Code			Academic Year		Semester
MEC424			3		Summer
Title			T	A	L
Robotics Project II			1	–	4
					ECTS
					6
Language		German			
Level		Undergraduate	✓	Graduate	Postgraduate
Department / Program		Mechatronic Engineering			
Forms of Teaching and Learning		Face-to-face lecture, teamwork, personal study.			
Course Type		Compulsory	✓	Elective	
Objectives		<p>The "Production Automation" project deals with the possible uses of sensor-based control of industrial robots, production systems and equipment. The aim is to design and implement a system for status recognition and object tracking in group work. Here, the students will work in groups on an experimental robot controlled by a camera, a production plant or equipment to work out the basics of connecting camera systems, image processing, object recognition and control.</p> <p>It is also important that the knowledge acquired is competently incorporated into the group performance. In addition, the importance of content-related and organizational interfaces within the framework of the work on the overall topic of the project should be deepened. The students acquire knowledge of:</p> <ul style="list-style-type: none"> - Use cases of industrial automation technology - Programming of PLC, Arduino, Raspberry PI - Basics of signal analysis, image and pattern recognition - Solution-oriented thinking and acting in group work <p>Field Education: 20% Method Education: 20% Integrated system training: 30% Social Skills Training: 30%</p>			

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Content	<p>Lecture:</p> <ul style="list-style-type: none">- Project planning from the offer phase to the complete commissioning of the control in a complex industrial automation system- Application of engineering methods to a specific system of automation technology- Sensor technology, controls, measurement data acquisition and analysis in the field of industrial robotics, production systems and equipment- Basics of GUI and human-machine interfaces laboratory:- Selection and integration of sensors- Interface programming / adaptation and system integration- Signal analysis, image and pattern recognition with Python, C / C ++- PLC, Arduino and Raspberry PI programming-Design and programming of human-machine interfaces-MATLAB applications	
Prerequisites		
Coordinator		
Lecturer(s)	Doç. Dr. Tuba Çonka YILDIZ, Dr.-Ing Soner Emeç, Dr. Öğr. Üyesi Ali Can Kaya, Prof. Anatoli Makarov, Dr. Öğr. Üyesi Abdülkadir Şanlı	
Assistant(s)	MSc. Fatih ÇÖGEN, MSc. Mustafa Hakan SANDIK, MSc. Ali KORUCU, MSc. Merve Teke Budaklı, MSc. Onur Akgün, BSc. Oğuzhan Memişoğlu, BSc. Bilge Kağan Dönmez	
Work Placement	None	
Recommended or Required Reading		
Books / Lecture Notes		
Other Sources		
Additional Course Material		
Documents		
Assignments		
Exams		
Course Composition		
Mathematics und Basic Sciences		%
Engineering		%
Engineering Design	40	%

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Social Sciences			%
Educational Sciences			%
Natural Sciences			%
Health Sciences			%
Expert Knowledge	60		%
Assessment			
Activity	Count		Percentage (%)
Midterm Exam	0		0
Quiz	0		0
Assignments	1		20
Attendance	0		0
Recitations	0		0
Projects	1		20
Final Exam	1		60
Total			100
ECTS Points and Work Load			
Activity	Count	Duration	Work Load (Hours)
Lectures	14	2	28
Self-Study	14	4	56
Assignments	4	4	16
Presentation / Seminar Preparation	4	2	8
Midterm Exam			
Recitations			
Laboratory			
Projects	1	50	50
Final Exam	1	10	10
Total Work Load			168
ECTS Points (Total Work Load / Hour)			6
Learning Outcomes			
1	Design of industrial automation system		

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2	System design, optimization, integration, verification and risk analysis
3	Image and pattern recognition with Python and C / C ++
4	PLC, Arduino and Raspberry PI programming
5	Consolidation of practical knowledge of control engineering
6	Basics of industrial production systems and equipment
7	PCB design
8	3D printing
9	MATLAB applications
10	Robot Operating System (ROS) applications
11	
12	

Weekly Content

1	Determination of project subjects
2	Technical research
3	Research materials
4	Research methods
5	Research methods
6	Application
7	Application
8	Application
9	Building prototypes
10	Building prototypes
11	Modifications
12	Presentations
13	Presentations
14	Presentations
15	

Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7
1	5	5	5				
2	5	5	5				

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3	5	5	5				
4							
5							
6							
7							
8							
9							
10							
11							
12							
Contribution Level		1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High					
https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=en&curSunit=5946							
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