

Course Details									
Code				Acad	Academic Year			Semester	
MEC428				3	3			Spring	
Title					Α	L	ECTS		
Smart Systems Project II					-	4	6		
Language	German								
Level	Undergraduate	$\checkmark$	✓ Graduate Postgraduate						
Department / Program	Mechactronics Engineering								
Forms of Teaching and Learning	Formal, group work, selfstudy								
Course Type	Compulsory			Ele	ctive			$\checkmark$	
Objectives	In the automation of the value added process of the "Intelligent Systems" Project, the "Machine Learning" deals with application possibilities. Purpose group according to the principle "Software as a Service" a server-based, intelligent state recognition of electrical facilities and equipment in its operation and to design and realize its control. Sensor for students, production, assembly and transportation in addition to controlled value-added processes, the sensor system in group work signal processing, pattern recognition and control basics. It is also important that the obtained information is sufficiently included in the group performance. In addition the meaning of the content and organizational interfaces in the working framework of the overall theme of the project should be detailed. Students obtain the following information: - Machine Learning applications in Automation - Programming PLC, Arduino, Raspberry PI - Signal analysis, image and pattern processing fundamentals - Adhere to solution-oriented thinking and group work								
Content	Lecture: - Project p - Control i - Applicati - Sensors, - Industria - Basics of Laboratory: - Selection - Interface - Signal an - MATLAB - PLC, Ardu - Design a	planning from t n a complex in ion of engineer controls, mea il robotics, pro GUI and huma and integration programming palysis, image a Applications uino and Raspl nd programmi	the offer phase dustrial autor ring methods to surement data duction facilit an-machine in on of sensors ( / adaptation and pattern re operry PI progra	e to the con nation syst to a specific a acquisitio ies and equ terfaces and systen cognition v amming machine in	mplete em c systen n and a lipment n integr vith Pyt terfaces	comm n of Au nalysis ts ation hon, C	issioning utomatio s in the fi	of the n technology eld of	



Prerequisites				
Coordinator				
Lecturer(s)	Doç. Dr. Tuba Çonka YILDIZ, DrIng Soner Emeç, Dr. Abdülka Anatoli Makarov	dir Şanlı, Dr. Ali Can Kaya, Prof.		
Assistant(s)	MSc. Fatih Çögen, MSc. Mustafa Hakan Sandık, MSc. Ali Koru MSc. Onur Akgün, BSc. Oğuzhan Memişoğlu, BSc. Bilge Kağaı	ıcu, MSc. Merve Teke Budaklı, n Dönmez		
Work Placement				
Recommended or Required R	eading			
Books / Lecture Notes	<ul> <li>Trächtler Ansgar, Gausemeier Jürgen, Semantische Technologien im Entwurf mechatronischer Systeme: Effektiver Austausch von Lösungswissen in Branchenwertschöpfungsketten</li> <li>Czichos Horst, Grundlagen und Anwendungen technischer Systeme</li> <li>Trächtler Ansgar, Gausemeier Jürgen, Intelligente Technische Systeme – Lösungen aus dem Spitzencluster Intelligente Technische Systeme OWL</li> </ul>			
Other Sources	- Exercises are available in electronic form			
Additional Course Material				
Documents				
Assignments				
Exams				
Course Composition				
Mathematics und Basic Sciences		%		
Engineering		%		
Engineering Design	40	%		
Social Sciences		%		
Educational Sciences		%		
Natural Sciences		%		
Health Sciences		%		
Expert Knowledge	60	%		
Assessment				
Activity	Count	Percentage (%)		
Midterm Exam				
Quiz				
Assignments	1	20		
Attendance				
Recitations				
Projects	1	20		
Final Exam	1	60		
	Total	100		



ECTS Points an	d Work Load					
Activ	vity	Count	Duration	Work Load (Hours)		
Lectures		28				
Self-Study	14 4 56					
Assignments	4 4 16					
Presentation / S Preparation	eminar 4 2 8					
Midterm Exam						
Recitations						
Laboratory						
Projects		1	50	50		
Final Exam		1	1 10			
	Total Workload			168		
		ECTS Po	<b>oints (</b> Total Workload / Hour)	6		
Learning Outco	omes					
1	Design of industrial automation system					
2	System design, optimization, integration, verification and risk analysis					
3	Image and pattern recognition with Python and C / C ++					
4	PLC, Arduino a	and Raspberry PI programming				
5	Consolidation	of practical knowledge of contro	l engineering			
6	Basics of indus	strial production systems and equ	uipment			
7	PCB Design					
8	3D Printer Des	ign				
9	MATLAB Applications					
10	Robotic Operating System (Robot Operating System, ROS)					
Weekly Conter	nt					
1	Determination of Subject of Project					
2	Technical Research					
3	Research Materials / Components					
4	Research Tech	Research Techniques				
5	Research Tech	Research Techniques				
6	Application					
7	Application					
8	Application					



9	Prototypes						
10	Prototypes						
11	Changes / Cha	llenges					
12	Presentation of Results						
13	Presentation of Results						
14	Presentation of Results						
Contribution o	f Learning Out	comes to Prog	ram Objective	s (1-5)			
	P1	P2	P3	P4	P5	P6	P7
1	<b>P1</b> 5	<b>P2</b> 5	<b>P3</b> 5	P4	P5	P6	P7
1 2	<b>P1</b> 5 5	<b>P2</b> 5 5	<b>P3</b> 5 5	P4	P5	P6	P7
1 2 3	P1 5 5 5	P2 5 5 5 5	<b>P3</b> 5 5 5	P4	P5	P6	P7
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1 2 3 Contribution Lev https://obs.tau.	P1 5 5 vel edu.tr/oibs/bol	P2 5 5 1: Low 2: Low-in ogna/progLearn	P3 5 5 termediate 3: Ir Outcomes.aspx	P4 htermediate 4: H ?lang=en&curS	P5 ligh 5: Very High unit=5946	P6	P7
1 2 3 Contribution Lev https://obs.tau. Compiled by:	P1 5 5 5 rel edu.tr/oibs/bol	<b>P2</b> 5 5 1: Low 2: Low-in ogna/progLearn R. A. Merve TEK	P3 5 5 termediate 3: Ir Outcomes.aspx	P4 ntermediate 4: H ?lang=en&curS	P5 ligh 5: Very High unit=5946	P6	P7