DEPARTMENT OFMECHATRONIC ENGINEERING
COURSE SYLLABUS

Course Details						
Code			**Academic Year**		**Semester**	
MEC313			4		WiSe	
Title			**T**	**A**	**L**	**ECTS**
Industrial Automation Technology			2	2	1	6

Language	German				
Level	**Undergraduate**	✓	**Graduate**		**Postgraduate**
Department / Program	Mechatronic Engineering				
Forms of Teaching and Learning	Formal				
Course Type	**Compulsory**	✓	**Elective**		
Objectives	**Knowledge:** Students acquire basic knowledge in the field of industrial automation technology. They understand the interrelationships between sensor, actuator, control and information technology. **Skills:** Students are able to select, assess and design individual automation components and processes (drives, sensors, controls) and to integrate them into automated systems. They independently develop and evaluate solutions in the field of control engineering and other automation technology problems. **Competences:** Students are able to independently place the acquired knowledge and skills in the context of selected areas of specialisation and to communicate them to their fellow students in an understandable and effective way. They analyse existing solutions and identify possible new approaches for automation components and systems with regard to social, economic and ecological aspects.				
Content	- Number systems and basics of logical operations - Pneumatic and electropneumatic controls - Fundamentals of system theory - Principles of control engineering - Position and speed control on machine tools - Basics of DC, synchronous and asynchronous drives - Basics of pneumatics and hydraulics - Implementation of controls in SPS and NC technologie Ind. Communication technologie (field buses: CAN and Profibus) - Sensor of automation technology				
Prerequisites	Analysis and Linear Algebra I (Math I), Physics I, Analysis and Linear Algebra II (Math II), Electrical Engineering I, Computer Science I/II, Metrology I				
Coordinator					
Lecturer(s)	Prof. Dr. Ing. Anatoli Makarov, Prof. Dr. Ing. Hasan Smajic				
Assistant(s)	B.Sc. Ferit Tiryaki				
Work Placement					

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Recommended or Required Reading	
Books / Lecture Notes	Script in electronic form. https://www.isis.tu-berlin.de/
Other Sources	

Additional Course Material	
Documents	
Assignments	
Exams	

Course Composition		
Mathematics und Basic Sciences		10%
Engineering		60%
Engineering Design		30%
Social Sciences		%
Educational Sciences		%
Natural Sciences		%
Health Sciences		%
Expert Knowledge		%

Assessment		
Activity	Count	Percentage (%)
Midterm Exam	1	40
Quiz		
Assignments		
Attendance		
Recitations		
Projects		
Final Exam	1	60
Total		100

ECTS Points and Work Load			
Activity	Count	Duration	Work Load (Hours)
Lectures	15	2	30
Self-Study			
Assignments			
Presentation / Seminar Preparation	1	2	2
Midterm Exam	1	2	2
Recitations	15	2	30
Laboratory			

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Projects			
Final Exam	1	2	2
		Total Work Load	66
		ECTS Points (Total Work Load / Hour)	6

Learning Outcomes	
1	Gains fundamental knowledge of applied control engineering.
2	Evaluate the technical characteristics of switching elements, sensors, drives and controls and their interrelationships.
3	Can select, evaluate and design individual automation components and processes and integrate them into automated systems.
4	Can independently develop and evaluate solutions in the field of control engineering and other automation problems.
5	Can apply acquired knowledge and skills in the context of independently selected specialties and bring them closer to other students in an understandable and effective way.
6	Can analyze existing solutions and identify new solution proposals for automation systems and facilities in terms of social, economic and ecological aspects.
7	
8	
9	
10	
11	
12	

Weekly Content	
1	Introduction to industrial automation technology
2	Fluidic control systems I
3	Fluidic control systems II
4	Connection Programmed Control System (VPS) I
5	Programmable logic controller (SPS I hardware)
6	Programmable logic controller (SPS II hardware)
7	Number systems, switching algebra and logic operations
8	Programmable logic controller (programming)
9	- Midterm Exam-
10	Measurement and data acquisition (sensor technology)
11	Drive Technology
12	Industrial communication (field buses)
13	Numerical controls

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14	Fundamentals of system theory
15	Principles of control engineering

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

	P1	P2	P3	P4	P5	P6	P7
1	5	5	5	5	5	5	-
2	5	5	5	5	5	5	-
3	5	5	5	5	5	5	-
4	5	5	5	5	5	5	-
5	5	5	5	5	5	5	-
6	5	5	5	5	5	5	-
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	
Compiled by:	Ali Korucu
Date of Compilation:	09.09.2022