	University of East Sarajevo Faculty of Electrical Engineering	
	Study program:Automation and electronics	
	Study degree: Bachelor — **Year:** III/IV	

Course title	**Programmable logic controllers**
Department	Automation and electronics
Target group	Ordinary students
Is the course offered to ERASMUS students?	Yes
Language:	English

Course code	**Course status**	**Semester**	**ECTS**
RI-ME0123	Obligatory	VII/VIII	5

Lecturer/Instructor	Prof dr Slobodan Lubura
Course Assistant(s)	

Course Meeting Times (weekly)	**L (lecture)**	**T (tutorial)**	**P (lab)**
	2	0	2

Course goals	This course covers basic to intermediate theory & applications of programmable logic controllers. PLCs are used in many industrial and commercial processes. It is expected that some technicians will be required to install, troubleshoot, program & modify PLCs and PLC controlled systems. The intent of this course is to have students develop the basic technician level skills required by industry.
Learning Outcomes	1. Describe various types of PLC and their application in automation systems, 2. Identify the inputs and outputs of a PLC in various applications, 3. Use counters, timers, algebraic and boolean operations, memory, subroutines etc. of PLC to do a certain task, 4. Write and test PLC Programs for small industrial automation applications,
Admission and requirements	none
Teaching Methods	• Interactive lectures and communication with students • Discussion and Group Works • Presentation • Homework • Project
Course Content per Week	1. PLC evolution, history, relay control, basic parts of PLC, ladder logic language, 2. PLC hardware, connection paths, CPU, memory, digital and analog interfaces (IO), 3. Addressing of IO, program cycle, scan time, 4. Relay schematics to ladder logic, field devices, IO modules, 5. PLC Programming and bit logic instructions, 6. PLC timer functions, typical industrial timing tasks, 7. PLC counters in ladder logic, typical industrial tasks, 8. Basic PLC math and logic functions, 9. Compare, Jump & MCR Instructions, 10. Subroutine Functions, typical industrial tasks, 11. Transferring data, operations with math functions, data manipulation, 12. Examples of processes with math/data operations on a fast and continuous basis, 13. PLC sequencer and shift register functions in control problems, 14. Troubleshooting & Servicing, 15. PLC Networks in Manufacturing.
Quality assessment methods	....
Specific note if any	-

Mandatory Literature

Author(s)	**Title, Publisher**	**Year**	**Pages**
Frank Petruzella	Programmable logic controllers, 4th edition McGraw Hill	2013	all

Recommended Literature

Author(s)	**Title, Publisher**	**Year**	**Pages**
John W. Webb, Ronald A. Reis,	Programmable Logic Controllers: Principles and Applications (5th Edition)	2003	all

	Activity	**Percentage**	**Activity**	**Percentage**

Method of knowledge assessment Description (%) (Grading)	Attendance	**5%**	Lab/Practical Exam	**20%**
	Quiz	**-**	Term Paper	**-**
	Homework	**10%**	Class Deliverables	**-**
	Project	**40%**	Presentation	**-**
	Midterm Exam	**-**	**Final Exam**	**25%**

ECTS (ALLOCATED BASED ON STUDENT'S WORKLOAD)			
Activities	**Quantity**	**Duration**	**Workload**
Lecture (15 weeks x Lecture hours per week)	15	3	45
Laboratory / Practice (15 weeks x Laboratory / Practice hours per week)	15	1	15
Assignment / Homework / Project	7	4	28
Seminar / Presentation			0
Preparation for Midterm Examination			0
Preparation for Final Examination	1	35	35
Midterm Examination (1 week)			10
Final Examination (1 week)	1	2	2
Total Workload (ETCS)			**5**

Web page	http://www.etf.ues.rs.ba
Date	