

## GAU, Faculty of Engineering

<b>Course Unit Title</b>	PLC's and Automation	
<b>Course Unit Code</b>	EEN420	
<b>Type of Course Unit</b>	Technical Elective, Electrical Eng. and Computer Eng.	
<b>Level of Course Unit</b>	4thYear BSc	
<b>National Credits</b>	3	
<b>Number of ECTS Credits Allocated</b>	6 ECTS	
<b>Theoretical (hour/week)</b>	2	
<b>Practice (hour/week)</b>	-	
<b>Laboratory (hour/week)</b>	2	
<b>Year of Study</b>	4	
<b>Semester when the course unit is delivered</b>	7-8	
<b>Course Coordinator</b>	Assst. Prof. Dr. Kamil Dimililer	
<b>Name of Lecturers</b>	Assist. Prof. Dr. Kamil Dimililer	
<b>Name of Assistant</b>		
<b>Mode of Delivery</b>	Face to Face, Laboratory Experiments, Assignments	
<b>Language of Instruction</b>	English	
<b>Prerequisites and co-requisites</b>	ENG206	
<b>Recommended Optional Programme Components</b>	Digital systems, basic programming	
<b>Objectives of the Course are to teach,</b>		
<ul style="list-style-type: none"> <li>➤ Role of digital systems in automation</li> <li>➤ PLC as a microcomputer,</li> <li>➤ Ladder diagrams and programming</li> <li>➤ PLC interfacing</li> </ul>		
<b>Learning Outcomes</b>		
When this course has been completed the students should be able to		Assesment.
1	Write programmes with simple ladder logic	1,5
2	Understand timers and counters and their applications in automation	1,5,6
3	Drive different electronic devices from PLC	5
4	Create ladder programmes for specific tasks by combining simple and advanced instructions	1,2,5
5	Describe and judge the requirements of PLC interfacing	1,6
Assesment Methods: 1. Written Exam, 2. Assignment 3. Project/Report, 4.Presentation, 5 Lab. Work, 6 Oral Exam		
<b>Course's Contribution to Program</b>		
		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	2
2	Ability to design and conduct experiments as well as to analyze and interpret data	4
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	2
4	Ability to apply systems thinking in problem solving and system design	5
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	3
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	3
7	Ability to express their ideas and findings, in written and oral form	2
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	4
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	2
10	Strong foundation on the fundamentals of Electrical and Electronics Engineering such as Circuit Theory, Signals, Systems, Control and Communications, which are necessary for successful practice in the field	4
11	Awareness on the contemporary requirements, methods and applications of the Electrical and Electronics Engineering	5
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate 4: High, 5: Very High)		

<b>Course Contents</b>			
Week			Exams
1		Introduction, Standards in PLC Programming Languages	
2			
3		Ladder Logic, Statemen Lists and Functional Block Diagrams	
4		Timers (SIMATIC)	
5		Counters (SIMATIC)	Midterm 1
6		Arithmetic and compare instructions	
7		Timers (IEC-1131-3)	
8		Counters (IEC-1131-3)	
9		Connertions to/from other devices (Motors, sensors etc.)	Midterm 2
10			
11		Designing systems	
12			
13		Designing systems	
14			Final
<b>Recommended Sources</b>			
<b>Textbooks:</b>			
1. Gary Dunning, Introduction to Programmable Logic Controllers, 3rd Edition, Thompson. 2006.			
2. System Manual of Siemens, SIMATIC S-7-200, 2002			
<b>Assessment</b>			
Attendance	5%		
Laboratory Examination	10%	Practice in the Lab and oral examination	
Design Problems	5%	Case Studies	
Quiz	15%	Problem Solving	
Midterm	25%	Problem Solving	
Final Exam	40%	Problem Solving	
Total	100%		
<b>ECTS Allocated Based on the Student Workload</b>			
Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (excluding the finalexam week)	15	2	30
Labs and Tutorials	14	2	28
Assignments	4	2	8
Project/Presentation/Report Writing	-	-	-
E-learning Activities	14	2	28
Quizzes	1	12	12
Midterm Examinations	1	15	15
Final Examination	1	18	18
Self Study	14	3	42
Total Workload			181
Total Workload/30 (h)			6.03
ECTS Credit of the Course			6