



MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering

Course Code	Course Name	Credits	Contact Hours
0401444	Power Systems Simulation and Modeling	3.0	3 T

INSTRUCTOR/COORDINATOR	
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Office Hours	10:00-11:00 (Sun, Tues, Thur)

TEXTBOOK	
Title	
Author/Year/Edition	
Title (1)	
Author/Year/Edition	
Title (2)	
Author/Year/Edition	

SPECIFIC COURSE INFORMATION
A. Brief Description of the Content of the Course (Catalog Description)
Examples of system simulations; systems; models and model validation; discrete system simulation; general purpose simulation system (GPSS); simulation experiments in practice; continuous system simulation; trends in simulation.
B. Pre-requisites (P) or Co-requisites (C)
Automatic Control (0401441)
C. Course Type (Required or Elective)
Elective
SPECIFIC GOALS

A. Course Learning Outcomes (CLOs)

By the end of this course, the student should be able to:

CLO 1: To provide students with the basic understanding, fundamental and concepts of Programmable Logic controllers

CLO2: To explain PLCs components, constructions and discuss the various necessary steps for constructing PLCs system.

CLO 3: To provide the students with the knowledge and skills essential to construct and program PLCs for industrial control application.

CLO 4: To give students practical information about installing, programming, and maintaining PLC systems.

CLO 5: To give students practical information about installing, programming, and maintaining PLC systems.

CLO 6: To Acquire skills of using computer packages from specific leading PLC: Allen-Bradley, Siemens, and OMRON

B. Student Learning Outcomes (SLOs) Addressed by the Course

1	2	3	4	5	6	7
	✓				✓	

BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
Unit 1: Programmable Logic Controllers (PLCs): An Overview	1	3
Unit 2: PLC Hardware Components	1.5	4.5
Unit 3/4: Number Systems / Codes Fundamentals of Logic	0.5	1.5
Unit 5: Basics of PLC Programming	1	3
Unit 6: Developing Fundamental PLC Wiring Diagrams and Ladder Logic Programs	2	6
Unit 7: Programming Timers	1	3
Unit 8: Programming Counters	1	3
Unit 9: Program Control Instructions	1	3
Unit 10/11: Data Manipulation Instructions and Math Instructions	1	4.5

Unit 12: Sequencer and Shift Register Instructions	1	3
Unit 13: PLC Installation Practices, Editing, and Troubleshooting	1	3
Unit 14: Process Control, Network Systems, and SCADA	1	3
Unit 15: ControlLogix Controllers	1	3
Total	14	42

EVALUATION		
Assessment Tool	Due Date	Weight (%)
Mid Exam	According to the university calendar	30
Course Work (Homeworks, Quizzes, Projects, ...etc.)	One week after being assigned	20
Final Exam	According to the university calendar	50

ABET's Students Learning Outcomes (Criterion # 3)		
	Relationship to program outcome	
ABET 1-7		
1.		an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2.	✓	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3.		an ability to communicate effectively with a range of audiences.
4.		an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5.		an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6.	✓	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7.

an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.