



MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering



Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0401447	Machine Controllers and Digital Control Lab	1	8:00-10:00 Monday

INSTRUCTOR/COORDINATOR

Name	Dr. Ziyad Almajali
Email/Office	ziyad@mutah.edu.jo
Office Hours	12:00-13:00 Sunday, Tuesday, Thursday
Classroom/Time	8:00-10:00

TEXTBOOK

Title	Lab Manual
Author/Year/Edition	-----
Other Supplemental Materials	
Title	
Author/Year/Edition	

SPECIFIC COURSE INFORMATION

A. Brief Description of the Content of the Course (Catalog Description)

The Lab contents aims to provide the student with various examples of machine controllers and its applications. The Lab introduces the student to some controllers such as the fuzzy logic controller and the on-off controller. The lab also includes controller optimization experiments such as the PID controller. Additionally, several selections of controller implementation schemes are included such as the AC and DC motor drive, the traffic light, and some process control experiments such as the PH and temperature control experiment.

B. Pre-requisites (P) or Co-requisites (C)

Digital Automatic Control (0401543) (P)

C. Course Type (Required or Elective)

Required

SPECIFIC GOALS

A. Course Learning Objectives (CLOs)

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

CLO1: Develop and conduct appropriate experimentation of different control schemes such as the fuzzy logic controller and the on-off controller in addition to different process controlling schemes [6].

CLO2: Develop and conduct appropriate experimentation for PID controller optimization [6].

CLO3: Develop and conduct appropriate experimentation for different motor drives and rotation and speed control schemes [6].

CLO4: Work effectively in groups by sharing responsibilities and collaborating on findings [5].

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

1	2	3	4	5	6	7
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BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
Introduction to lab protocols and safety measures	1	2
Fuzzy logic system	1	2
PID controller; stability, optimization	1	2
Connection and rotation reversing	1	2
DC motor drive	1	2
AC motor drive	1	2
Mid exam	1	2
Traffic light	1	2
Simple DC motor controller (rotation direction)	1	2
PH; process control	1	2
Temperature; process control	1	2
Level control	1	2
Free lab	1	2
Final Exam	1	2

Total 14 28

EVALUATION		
Assessment Tool	Due Date	Weight (%)
Mid Exam	According to the university calendar	20
Course Work (Homeworks, Quizzes, Projects, ...etc.)	One week after being assigned	40
Final Exam	According to the university calendar	40

ABET's Students Learning Outcomes (Criterion # 3)		
Relationship to program outcomes		
ABET 1-7	Engineering Student Outcomes	
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.