



**JORDAN UNIVERSITY OF SCIENCE & TECHNOLOGY**  
**MECHANICAL ENGINEERING DEPARTMENT**  
**ME 545 Mechatronics Lab II**  
**\_\_\_\_\_ Semester**

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**Catalog Data – 2013:** Pneumatic system design, Electro-pneumatic system design, Electro-Hydraulic system design, Programmable logic controller (PLC), Sensors.

**Text Book(s):** Lab Notes.

**Instructor:** \_\_\_\_\_

**Class Schedule:** \_\_\_\_\_

**Office Hours:** \_\_\_\_\_

**Pre/Co-Requisite:** ME 543 Mechatronics System Integration

**Outcomes:** After successfully completing this course, the students should be able to:

- 1- Identify different types of sensors and actuators.
- 2- Simulation and Implementation of low cost designed automation using electro-pneumatic and electro-hydraulic systems.
1. Simulation and Implementation of PLC Ladder logic to automate industrial processes, data acquisition and intelligent control.

**Topics Covered:**

- **Introduction to Pneumatics..... (1 classes)**
- **Pneumatics: Circuit diagrams and implementation. (1 classes)**
- **Pneumatics: Advanced circuit design..... (1 classes)**
- **Electro-pneumatics: Circuit diagram and implementation..... (1 classes)**
- **Electro-pneumatics: Advanced circuit design..... (1 classes)**
- **Electro-hydraulics: Circuit diagram and implementation..... (1 classes)**
- **Introduction to Software and Hardware of PLC.... (1 classes)**
- **PLC: Design and implementation of an automated system..... (1 classes)**
- **PLC Trainer Introduction, hardware & software.. (1 classes)**
- **PLC: Design and implementation of a Ladder Diagram..... (1 classes)**
- **Sensors: (Optical, Capacitive, inductive, & ultrasonic set of sensors)..... (1 classes)**

**Computer Usage:** Yes

**Design Activities/Project(s):** Yes

**Lab. Experiment(s):** Yes

**Scientific Visit(s):** None

**Evaluation:** Lab Work (Team Work) :

- Design: 5%
- Implementation: 5%

Quizzes: 10%

Final Project:  
 - Documentation: 10%  
 - Implementation: 5%  
 - Discussion: 5%

Mid-term examination : 20%  
 Final Examination : 40%

**Relationship of the Course to ME Outcomes:**

ABET a – k	√	Level (L, M, H)	Mechanical Eng. Program Outcomes
a			a. Apply knowledge of mathematics, science, and engineering in practice.
b	√	H	b. Design and conduct experiments as well as analyze and interpret data.
c	√	M	c. Design a system, components, or process to meet desired needs.
d	√	M	d. Function on multidisciplinary teams.
e	√	M	e. Identify, formulate, and solve engineering problems.
f			f. Understanding of professional and ethical responsibility of an engineer.
g	√	M	g. Communicate effectively.
h			h. Broad education to understand the impact of engineering solutions in global and societal context.
i			i. Recognition of the need for, and possess the ability to engage in, lifelong learning.
j			j. Possess knowledge of contemporary issues.
k			k. Use the techniques, skills, and modern engineering tools necessary for engineering practice.

**L: Low, M:Medium, H: High**

**ABET Category:**

Engineering Science 3 Credits  
 Engineering Design 0 Credits

**Prepared By:** \_\_\_\_\_

**Date:** \_\_\_\_\_

- Rules and notes:**
- 1) Never come late to the classroom, you will disturb your mates and your instructor if you do so.
  - 2) Turn OFF your cell phones during the class.
  - 3) DO NOT TALK during the class please, unless you have a question for me.
  - 4) No quizzes make-ups.
  - 5) Make up exams are not held without an official signed and approved excuse from the **Department Chairman**. Please understand that this is a university law and I have no control over it.
  - 6) Office hours are the hours I dedicate for you to ask me. If you think they do not suit you, then we can still arrange for a time of our convenience by sending an e-mail to me (you should expect an approval from my side).
  - 7) The exams specified on the course syllabus are not subject to negotiations or change once approved by you **TODAY**. It is your responsibility to inform the other instructors about your assigned exams.