



**MUTAH UNIVERSITY**  
**Faculty of Engineering**  
**Department of Electrical Engineering**



**Course Syllabus**

Course Code	Course Name	Credits	Contact Hours
0401448	Measurements & Instrumentation lab	1	2 T

INSTRUCTOR/COORDINATOR	
Name	Prof. Mustafa Muheilan
Email	<a href="mailto:muheilan@mutah.edu.jo">muheilan@mutah.edu.jo</a>
Office Hours	1:00-2:00 (Tues)

TEXTBOOK	
Title	Electronic Instrumentation
Author/Year/Edition	H.S. Kalsi , Tata McGraw Hill / 2018/Third Edition
Other Supplemental Materials	
Title	Electronic Instruments and Measurements
Author/Year/Edition	Larry D. Jones, A. Foster Chin, Prentice-Hall Int /1991/ 1 <sup>st</sup> Ed

SPECIFIC COURSE INFORMATION
<b>A. Brief Description of the Content of the Course (Catalog Description)</b>
This Lab provides the principles for accuracy of electrical measurements and error analysis. The course will cover various subjects namely, Absolute and secondary instruments and indicating instrument such as moving coil and moving iron instruments, dynamometer. DC/AC meters, bridges (DC/AC), electronic measuring instruments, transducer which includes: position, direction, distance, motion, light and associated radiation, temperature, sound, infrasound and ultrasound and environmental sensors and actuators, and finally oscilloscope.
<b>B. Pre-requisites (P) or Co-requisites (C)</b>
Measurements & Instrumentation (0401442) (P)
<b>C. Course Type (Required or Elective)</b>
Required



## SPECIFIC GOALS

### A. Course Learning Outcomes (CLOs)

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

**CLO1:** Measurements of resistance, Measurements using AC bridges, Measurements using oscilloscope [6].

**CLO2:** Measurements using RMS meters, Design of multirange voltmeter, Design of multirange ammeter, Design of multirange ohmmeter, Basic OP-AMP circuits, OP-AMP applications, Strain gauges, LVDT [6].

**CLO3:** Work effectively in groups (teamwork) by sharing discuss and analyze the results [5].

### B. Student Learning Outcomes (SOs) 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
Experiment 1: Measurements of resistance.	1	2
Experiment2: DC test : Measurements using AC bridges.	2	4
Experiment3: Measurements using DC bridges.	1	2
Experiment4: Measurements using oscilloscope.	2	4
Experiment5: Measurements using RMS meters.	1	2
Experiment6: Design of multirange voltmeter.	2	4
Experiment7: Design of multirange ammeter ohmmeter.	2	4
Experiment8: OP-AMP circuits, OP-AMP applications, Strain gauges, LVDT	3	6
<i>Total</i>	<i>14</i>	<i>28</i>

## EVALUATION

Assessment Tool	Due Date	Weight (%)
Mid Exam	According to the university calendar	20
Lab Reports	One week after being taken	40
Final Exam	According to the university calendar	40

**ABET's Students Learning Outcomes (Criterion # 3)**

<b>Relationship to program outcomes</b>	
<b>ABET 1-7</b>	<b>Engineering Student Outcomes</b>
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.