



Philadelphia University

Faculty of Engineering and Technology
Department of Mechanical Engineering

Course Information

Course Title:	Engineering Measurement Lab. (620345)
Prerequisite:	Engineering Measurement (620344)
Credit Hours:	1 credit hour (14 weeks per semester)
Textbook:	Lab manual and lecture notes
References:	Introduction to INSTRUMENTATION AND MEASUREMENTS, Robert B. Northrop, 2nd edition Taylor and Francis, 2005.

Course Description: The course is one of the important requirements for Mechanical Engineering student, and this course will expose the students to various sensors and measurement instruments needed for his projects in other courses as well as his graduation project.

Course requirements: Computer, internet connection, webcam.

Instructor: **Eng. Nessreen Al-zboon**
Office: Mechanical Engineering building, room E6313 , ext. : 2624
Office hours:

Course Topics(Experiments):

Week	Topic
1	Introduction and How to write a report.
2	Linear Measurement
3	Angular Measurement
4	Characteristics of the humidity sensor, Characteristics of the flow sensor, Characteristics of the pressure sensor.
5	Investigation of Wheatstone Bridge Circuit
6	Strain Gauge Characteristics
7	Temperature Measurement
8	Illumination Measurement
9	Speed Measurement (part 1)
10	Speed Measurement (part 2)

11	Review for Lab
12	Final Exam

ABET Student Outcomes (SOs)

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

Course Learning Outcomes and Relation to ABET Student Outcomes:

Upon successful completion of this course, a student should be able to:

1.	Understand some important concepts in measurement such as :(accuracy, precision, error and uncertainty).	[6]
2.	Learn how to use Micrometer, Vernier caliper, Sine Bar, Bevel Protractor in the linear and angular measurement.	[6]
2.	Ability to conduct experiments to measure resistance by using Wheatstone bridge, strain, temperature, illumination, speed.	[6]
3.	Compare the theoretical result with experimental one	[6]
4.	Analyze and interpret results, and draw proper conclusions	[6]

Evaluation methods:

Evaluation of students' performance (final grade) will be based on the following categories:

Reports: Each experiment has a report describing theory, procedure, readings, results, discussion, and conclusion.

Quizzes: Three quizzes will be given to the students during the semester. These quizzes will cover each three experiments in the lab. Fifteen minutes for each quiz.

Final Exam: The final exam will cover all the class material.

Grading policy:

Mid	30% (15% Reports, 15% Quiz)
Third	30% (15% Reports, 15% Quiz)
Final Exam	40%
Total:	100%

Attendance policy:

Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse, acceptable to and approved by the Dean of the relevant college/faculty, shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.