



JORDAN UNIVERSITY OF SCIENCE & TECHNOLOGY
MECHANICAL ENGINEERING DEPARTMENT
ME 471 Engineering Instrumentation
_____ Semester

Catalog Data - 2013 : 3 Credit hours (3 h lectures) Analysis of experimental data. Basic electrical measurement and sensing devices. Displacement, area, pressure, flow, temperature, thermal and transport properties, force, and torque and strain measurements.

Text Book(s): James W. Dally, 1993 "Instrumentation for Engineering Measurements", Second Edition.

References: Some website addresses will be given to the students through the semester to look for new transducers available.

Instructor: _____

Office Hours: _____

Pre/Co-Requisites: ME 301, ME 331, EE 303

Objectives:

- 1-Develop the student's ability to analyze experimental data
- 2-Develop the student's ability to relate theoretical principles to real engines.
- 3-Develop the student's working knowledge of design point and off-design point calculations.
- 4-Extend the student's capabilities to design and evaluate performance of different measurements systems.

Topics Covered:

- Introduction
- Chapter 1: Applications of electronic instrumentation systems
- Chapter 2: Analysis of circuits
- Chapter 13: Statistical methods
- Chapter 3: Analog Recording instruments
- Chapter 5: Sensors for transducers
- Chapter 6: Signal Conditioning circuits
- Chapter 7: Resistance-Type strain gages
- Chapter 8: Force, torque and pressure measurements
- Chapter 9: Displacement, Velocity, and acceleration measurements
- Chapter 11: Temperature measurements
- Chapter 12: Fluid flow measurements
-

Computer Usage:

Microsoft Excel.

Design

Activities/Project(s):

There will be some design problems for some transducers in class and as HWs.
The instructor will bring some portable recorders and transducers to the class.

Lab. Experiment(s): The students will be able to take the lab (ME 413: Instrumentation and Dynamic Systems Lab) after taking this course. This lab will cover some experiments related to some transducers learned in this class.

Scientific Visit(s): The students are encouraged to visit strength of material lab, Mechatronics lab and instrumentation lab, to see type of measurements available in our labs.

Evaluation:

Homeworks & Quizzes	10%
1 st Exam	25%
2 nd Exam	25%
Final Exam	40%

Relationship of the Course to ME Outcomes:

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

ABET Category:

Engineering Science	3	Credits
Engineering Design	0	Credits