Zarqa University

Faculty of
Department: Electrical Engineering
Course title: Measurements and Instrumenta)

Prerequisite: 0904324
Instructor: Eng. Ala'a Shakatreh
Lecture's time: Mon, Wed 11:00-12:30
Semester: 2nd 16/17
Office Hours: S, Tue, Thu 9-10 , 11-12

Course description:

Units and error; AVO meters; bridges; potentiometers; oscilloscope; spectrum analyzer and calibration; data acquisition; sensors: types and applications (mechanical; electrical; ultrasonic; photoelectric); measurement of force; torque; pressure; displacement; velocity; acceleration temperature and flow

Aims of the course:

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- **a.** An ability to apply knowledge of mathematics, science and engineering
- **b.** An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- **c.** An ability to identify, formulates, and solves engineering problems

Intended Learning Outcomes (ILOs):

1. Define the functional elements of a measurement system
2. Develop an overview of Static and Dynamic Performance Characteristics of Instrumentation-Measuring Systems.
3. Define the sources of errors in Measurements
4. To be familiar with indicating and test instruments such as analog and digital meters and oscilloscopes.
5. Overview of DC and AC bridges types
6. Familiarize the student with Resistance, inductance, capacitance, frequency and phase measurements
7. Overview of Data acquisition and Spectrum analyzer
8. Has knowledge of Temperature, Pressure and Torque Measurements.
9. Introduce the type of sensors and their applications.

Course structures:

Week	C. Hrs	ILOs	Topics	Teaching Procedure	Assessment methods
1	3	1	Introduction to measurements Systems	Textbook and Handout	First Exam
2,3	4	1,2	Instrumentation types and performance characteristics	Textbook and Handout	First Exam
3,4	4	3	Sources of errors in Measurements	Textbook and Handout	First Exam
4,5	7	4	Electrical Indicating and	Textbook and	Second Exam

			Test Instruments	Handout	
6,7,8	9	5,6	Variable conversion elements	Textbook and Handout	Second Exam
9,10	6	8	Temperature, Pressure and Torque Measurements	Handout	Final Exam
11	2	7	Data acquisition	Textbook and Handout	Final Exam
12	2	7	Spectrum analyzer	Textbook and Handout	Final Exam
13	3	9	Type of sensors and their applications.	Handouts	Final Exam
14	2		Review	Textbook and Handout	

References:

Alen S. Morries, Reza Langari, "Measurement and Instrumentation: Theory and Application", 2nd edition, 2016.

Assessment Methods:

Methods	Grade	Date
First Exam	20	5/04/2017
Second Exam	20	10/05/2017
Quizes	10	
Final Exam	50	By department