

Faculty of Engineering & Technology
Electrical and Electronic Measurements

Information :

Course Code : EPR 364 **Level :** Undergraduate **Course Hours :** 3.00- Hours

Department : Department of Electrical Engineering

Instructor Information :

Title	Name	Office hours
Associate Professor	Mohamed Hassan Mohamed Elmahlawy	5
Assistant Lecturer	Ahmed Essam Fahim Zahran	
Teaching Assistant	Ahmed Mahmoud Mohamed Mahmoud Hegazy	

Area Of Study :

1. Define the principle of operation of various DC and AC instruments used for measurement of the electrical parameters.
2. Be able to build, assemble and use the instruments and devices for the relevant measurements.
3. Work cooperatively and effectively in a group
4. Find information independently

Description :

Introduction to measurements, Units, Standards, Method of measurement, Dynamics and types of deflection instruments, Moving coil, Moving iron, Electro-dynamic instruments and applications, Current, Voltage, Power, Energy, Charge, Power factor and frequency measurements, Waveform error in rectifier voltmeter and diode peak voltmeters, Null methods such as potentiometers, DC and AC bridges, Measurement of non-electrical parameters: strain, temperature measurement. Analog to digital and digital to analog converters, Voltage-to-frequency converters. Digital measuring instruments: digital voltmeters, digital counters, frequency and time meters, Oscilloscopes: block diagram, deflection sensitivity, applications in phase and frequency measurements, Digital oscilloscopes.

Course outcomes :

a. Knowledge and Understanding: :

1 -	Define the principles of operation of the DC and AC meters.
2 -	Be able to list the instrumentation and measurement systems.
3 -	Illustrate the characteristics of the Cathode-Ray Oscilloscope.
4 -	Be able to list realistic circuits for the signal generators.

b. Intellectual Skills: :

1 -	Express ideas in structural and mathematic terms so that quantities evaluation is facilitated
2 -	Ability to apply different alternative solutions.
3 -	Decide and chose among different measurement alternatives.
4 -	Evaluate obtained results both individually or as a part of team.

c. Professional and Practical Skills: :

1 -	Perform different measurements on basic instruments.
2 -	Perform simple Lab experiments.
3 -	Collect information from collected data in the lab.

d. General and Transferable Skills: :

1 -	Write technical reports in accordance with standard scientific guidelines.
2 -	Work in a self-directed manner.
3 -	Work coherently and successfully as a part of a team in the Lab.
4 -	Analyze problems and use innovative thinking in their solution.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Measurements, Units, Standards, Methods of measurement.	5	3	2
Electro-dynamic instruments and applications	10	6	4
Current, Voltage, Power, Energy, Charge, Power factor and frequency measurements	10	6	4
Waveform error in rectifier voltmeter and diode peak voltmeters, Null methods	10	6	4
Analog to digital and digital to analog converters. Voltage-to-frequency converters.	5	3	2
Digital voltmeters, digital counters, frequency and time meters	10	6	4
Oscilloscopes (Analog and DSO)	10	6	4
Spectrum Analyzers	5	3	2

Teaching And Learning Methodologies :

Lectures
Tutorials
Laboratories

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Final Written exam	40.00	15	to assess the comprehensive understanding of the scientific background of the course, to assess the ability of problem solving with different techniques studied
Laboratory Tutorials	10.00	6	to assess the ability of implementing a simple electric circuit that shows knowledge and understanding of different technical issues.
Mid- Term 2	15.00	11	to assess the skills of problem solving, understanding of related topics.
Mid-Term 1	15.00	7	to assess the skills of problem solving, understanding of related topics.

Performance	10.00	14	to assess the Performance of the student through overall term
Quiz 1 & Assignment 1	5.00	5	to assess the skills of problem solving, understanding of related topics.
Quiz 2 & Assignment 2	5.00	9	to assess the skills of problem solving, understanding of related topics.

Recommended books :

1. Electronic Instrumentation and Measurements - David A Bell, PHI/ Pearson Education, 2006
2. Electronic Instrumentation - H. S. Kalsi, TMH, 2004