FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

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	4
Assistant Lecturer	Ahmed Essam Fahim Zahran	
Assistant Lecturer	Mostafa Mohamed Salaheldin Abdelkhalek	8
Assistant Lecturer	Marwa Mohamed Zaki Mohamed Shaheen	

Area Of Study :

Develop the students' knowledge about Analog & Digital instruments and transducers.
Develop studentsôpractical skills for designing and building up a complete application circuit.
Train students to perform basic experiments on Analog & Digital instruments.

Description :

Introduction to Units, Standards, and Measurements Errors. Electromechanical Instruments and DC meters. Resistance, Inductance and Capacitance measurements, DC/AC bridges. Digital Basic Instruments, Digital counters, A/D & D/A converters. Digital measuring instruments: digital multimeters and frequency meters. Cathode Ray Oscilloscopes and its applications in phase and frequency measurements, Digital Storage Oscilloscopes, Spectrum Analyzer.
Electromechanical Transducers: Variable resistance, capacitance and inductance transducers, Strain Gauge, Linear Variable Differential Transformer.
Temperature Transducers: The Thermocouple and the Thermistor.
Light Transducers: The photoconductive cell and photodiode.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Explain the analog multi-meters and its applications as well as the DC / AC bridges.
2 -	Describe digital multi-meters, digital counters, and frequency meters.
3 -	Explain the cathode ray oscilloscope and digital oscilloscope and its applications in different measurements.
4 -	Illustrate signal generators and spectrum analyzers.
5 -	Classify the electrical and electronic transducers according to its applications.
b.Intellectual Skills: :	
1 -	Prepare a technical report.
2 -	Apply different applications to analog and digital meters.
3 -	Investigate the failure of the labs equipment and transducers.

c.Professional and Practical Skills: :	
1 -	Build experiments, and interpret their results using analog & digital measuring instruments and relevant laboratory equipment.
2 -	Develop troubleshooting experiments using the laboratory tools in the course project.
3 -	Practice main functions of analog & digital instruments and transducers.
4 -	Follow up safety requirements at lab.
d.General and Transferable Skills: :	
1 -	Collaborate effectively within multidisciplinary team.
2 -	Work coherently and successfully as a part of a team in the Lab and assignments.
3 -	Effectively manage tasks, time, and resources during the project and lab experiments.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Electromechanical Instruments	5	3	2
Electromechanical Applications	5	3	2
Digital Basics	5	3	2
Digital Instruments and Frequency meters	10	6	4
Cathode Ray Oscilloscope	15	9	6
Digital Oscilloscope.	10	6	4
Function Generators & Spectrum Analyzers.	10	6	4
Review on Measurements Units & Errors.	5	3	2
Sensors & Transducers	10	6	4

Teaching And Learning Methodologies :

Interactive Lecture
Discussion
Problem Solving
Experimental Learning
Cooperative Learning
Project

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	5.00		
Final Exam	40.00		
Lab and Project	15.00		
Mid- Term II	15.00		
Mid-Term I	15.00		
Quizzes	10.00		

Recommended books :
Sabrie Soloman, ñSensors Handbookòï Mc GrawHill, 2nd Ed, 2010.