

**DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COURSE SYLLABUS**

EE 306: Electrical Engineering Technologies

COURSE TITLE	CODE & NUMBER	SUBJECT AREA	Contact Hours			Credit Units
			Th.	Pr.	Tr.	
Electrical Engineering Technologies	EE 306	Engineering and Design	2	3		3
Pre-requisites:	EE 250, STAT 110					
Course Role in Curriculum (Required/Elective):	Required Course					
Catalogue Description: Electrical engineering fields of activities. Sources of electrical energy: power supplies, batteries, generators and alternative power sources. Distribution and utilization of electrical energy, commentators and protection devices. Conversion of electrical energy; sensors and actuators. Electrical safety. Principles of electrical and electronic measurements and instrumentation, standards and calibration. Sources of measurement errors, and analysis of measured data.						

Textbooks:

(Author, Title, Pub., year)

1. J. Hiley, K. Brown and I. M. Smith, *Hughes Electrical and Electronic Technology*, 12th ed., Prentice Hall, 2016.
2. Northrop, *Introduction to Instrumentation and Measurements*, 3rd ed., CRC Press, 2014.

Supplemental Materials:

1. J. Bird, *Electrical and Electronic Principles and Technology*, Newnes/Elsevier, 2010
2. R.S. Khandpur, *Printed Circuit Boards Design Fabrication and Assembly*, McGraw-Hill, 2006.

Course Learning Outcomes:

By the completion of the course the students should be able to:

1. Choose proper Electrical Engineering components for specific applications.
2. Explain the sources of measurement errors, characteristics of measuring instruments that yields the error and need for calibration.
3. Apply statistical analysis tools (mean, median, histogram, variance, etc.) to describe collected data.
4. Apply error propagation in calculations of error, accuracy and uncertainties for data with uncertainties.
5. Determine the specification of the measuring device based on the properties of the quantity to be measured.
6. Explain how small circuit components collectively combined to perform larger task.
7. Explain the principle of operation of some electrical measuring instruments.
8. Explain the principle of operation of CRT.
9. Perform calculation of electrical power in single phase and three phase systems.

10. Identify the critical issues for sensor choice, placement, and circuit implementation.
11. Analyze temperature measuring circuits and systems.
12. Analyze circuits and systems used in measuring mechanical strain and stress.

Topics to be Covered:

**Duration
in Weeks**

1. Measurement Units	1
2. Electrical Systems and Resistors	1
3. Capacitors	1
4. Inductors and Transformers	1
5. Measurements of DC Voltage, Current and Resistance	2
6. Measurement of AC current and Voltage	2
7. Oscilloscope	1
8. Measurement Theory	2
9. Sensors	2

Key Student Outcomes addressed by the course: (Put a ✓ sign)

(1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	
(2) An ability to apply the 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, creates 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	

Instructor or course coordinator: Prof. Yasser Mostafa Kadah

Last Spring 2020

updated: