

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

<i>COURSE TITLE</i>	<i>ENGLISH CODE/NO</i>	<i>ARABIC CODE/NO.</i>	<i>CREDITS</i>			
			<i>Th.</i>	<i>Pr.</i>	<i>Tr.</i>	<i>Total</i>
ELECTRICAL ENGINEERING TECHNOLOGIES	EE306	EE306	2	3	-	<b>3</b>
<i>Pre-requisites:</i>	EE250 , STAT110					
<i>Course Role in Curriculum</i>	<i>Required or Elective:</i>		Required			
	<i>A pre-requisite for:</i>		EE370			
<i>Catalogue Description:</i> This course introduce the concept of measurements, errors, uncertainties and accuracy in measurement. The basic components in electrical engineering are explained. The characteristics and operation of measuring devices for voltage, current, electrical power and temperature measurement are also discussed.						

**Textbooks:**

1. J. Hiley, K. Brown and I. M. Smith, *Hughes Electrical and Electronic Technology*, 11<sup>th</sup> ed., Prentice Hall, 2012. (ISBN: 978-0273755104).
2. Northrop, *Introduction to Instrumentation and Measurements*, 3<sup>rd</sup> ed., CRC Press, 2014. (ISBN: 978-1466596771)

**Supplemental Materials:**

1. J. Bird, *Electrical and Electronic Principles and Technology*, Newnes/Elsevier, 2010. (ISBN: 978-0-08-089056-2)
2. R.S. Khandpur, *Printed Circuit Boards Design Fabrication and Assembly*, McGraw-Hill, 2006. (ISBN: 978-0071464208)

**Course Learning Outcomes:**

By the completion of the course the student 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.

<b><u>Topics to be Covered:</u></b>	<b><u>Duration in Weeks</u></b>
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

**Student Outcomes addressed by the course:** (Put a  $\checkmark$  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 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, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	$\checkmark$
(6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	$\checkmark$
(7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	

**Key Student Outcomes assessed in the course:** (5), (6)

**Evaluation Criteria:**

Homework	10%
Lab Work + Lab Exam	20%
Major Exams	30%
Final Exam	40%

**Instructor:**

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