DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COURSE SYLLABUS

COURSE TITLE	*ENGLISH CODE/NO*	*ARABIC CODE/NO.*	*CREDITS*			
			Th.	*Pr.*	*Tr.*	*Total*
ELECTRICAL ENGINEERING TECHNOLOGIES	EE306	EE306	2	3	-	**3**
Pre-requisites:	EE250 , STAT110					
Course Role in Curriculum	*Required or Elective:*		Required			
	A pre-requisite for:		EE370			

Catalogue Description:
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*, 11th ed., Prentice Hall, 2012. (ISBN: 978-0273755104).
2. Northrop, *Introduction to Instrumentation and Measurements***,** 3rd 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.

Topics to be Covered:		***Duration in Weeks***
1.	Introduction, Energy sources, Conductors and insulators.	1
2.	Resistors, Capacitors, Inductors, Transformers.	2
3.	Measurement and Error in Design of Experiments and Data Analysis.	1
4.	Uncertainty Analysis	1
5.	Measurements of Voltage, Current and Resistance	1
6.	Measurement of AC current and Voltage	1
7.	Oscilloscope	1
8.	Digital Measurement instruments	1
9.	Measurement of Electrical Energy	1
10.	Temperature measurement	2
11.	Measurement of displacement and mechanical strain	1

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

(a)	an ability to apply knowledge of mathematics, science, and engineering	
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	√
(c)	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	
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	

Key Student Outcomes assessed in the course: (b)

Instructor or course coordinator:
Prof. Yasser Mostafa Kadah
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King Abdulaziz University
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Evaluation Criteria:

Lab Work + Lab Exam	20%
Three Major Exams	30%
Term Mini-Project	20%
Final Exam	30%

Last updated: August, 2015