DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COURSE SYLLABUS

EE 250: Basic Electrical Circuits

COURSE TITLE	*CODE & NUMBER*	*SUBJECT AREA*	Contact Hours			Credit Units
			Th.	*Pr.*	*Tr.*	
Basic Electrical Circuits	**EE 250**	Engineering	3	2		4
Pre-requisites:	PHYS 202					
Course Role in Curriculum *(Required/Elective):*	Required Course					
Catalogue Description: Electric quantities and circuit elements. Ohm's law and Kirchhoff's laws. Mesh and Nodal analyses. Super position, Source transformation, Thevenin's and Norton's theorems, maximum power transfer. Sinusoidal steady-state analysis using phasors. AC power calculations. Ideal transformer. Three-phase circuits.						

***Textbooks*:** *(Author, Title, Pub., year)* C.K. Alexander and M.N.O. Sadiku, *Fundamentals of Electric Circuits*, 6th ed, McGraw-Hill,2019.

***Supplemental Materials*:** W. H. Hayt, *Engineering Circuit Design*, 8th. Ed. McGraw-Hill, 2013.

***Course Learning Outcomes*:**

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

1. Explain the fundamental electric quantities: voltage, current, electric power, and energy, dependent and independent ideal voltage and current sources.
2. Apply Ohm's, KVL, KCL to resistive circuits, reduction of series and parallel resistances, voltage and current divisions. Wye delta transformation.
3. Apply nodal and mesh analysis to circuits containing dependent and independent sources.
4. Apply network theorems to simplify a resistive circuit by finding the Thevenin and Norton equivalent of a two-terminal network, superposition, and source transformation. Maximum power transfer.
5. Apply KVL and KCL to circuits containing resistor, capacitor and inductor with DC input at steady state conditions.
6. Apply phasor analysis to circuit with steady state sinusoidal input. Develop the concept of Impedance and admittance. Average value and RMS value
7. Apply KVl, KCL, Ohm's, Nodal, Mesh, superposition, source transformation, Thevenin's and Norton to circuits with sinusoidal steady state input
8. Apply phasor analysis to calculate the average, reactive, complex and apparent power. Power factor correction. Maximum power transfer.
9. Derive the voltage and current relationship for an ideal transformer. Three phase circuit.
10. Work with a small team to carry out experiments in electric circuits and prepare reports that

present lab work.

Topics to be Covered:		***Duration in Weeks***
1.	Fundamental electric quantities: voltage, current, power and energy.	1
2.	Resistance, capacitance and inductance, (KVL & KCL), Source equivalence and series and parallel equivalent resistance	3
3.	Mesh and node analysis	1
4.	Circuit theorems	2
5.	Capacitor, inductor , steady state DC	1
6.	Steady state sinusoidal phasor analysis	3
7.	AC power analysis Power triangle and power factor correction	1
8.	Balanced three phase circuits and power measurement	1
9.	Introduction to Ideal transformer	1

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: Dr. Mohamad Ajour
Last updated: Spring 2020