DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COURSE SYLLABUS

EE 301: Electrical Circuits and Systems

COURSE TITLE	*CODE & NUMBER*	*SUBJECT AREA*	Contact Hours			Credit Units
			Th.	*Pr.*	*Tr.*	
Basic Electrical Circuits	**EE 301**	Engineering	3	2		3
Pre-requisites:	EE 250, MATH 204					
Course Role in Curriculum *(Required/Elective):*	Required Course					
Catalogue Description: Resonance circuits. Magnetically-coupled circuits. Op-amp circuits. Transient analysis via the conventional and Laplace methods. Fourier series and Fourier transform analysis with applications to circuits.						

***Textbooks*:** *(Author, Title, Pub., year)* C. K. Alexander and M. N. Sadiku*, Fundamentals of Electric Circuits*, 5th 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. Apply KVL, KCL and Ohm's to ideal op-amp circuits.
2. Apply KVL, KCL and Ohm's to electric circuits with magnetically coupled elements.
3. Apply first order differential equation analysis to first order circuit
   4. Evaluate series and parallel resonance circuits
4. Apply Laplace transform to circuit analysis, convolution.
5. Apply Fourier series to circuit analysis
6. Apply Fourier Transform to circuits analysis
7. Derive the convolution integral form of two signals, use the convolution integral to find the response of electrical circuits and the graphical method of the convolution integral to find the electrical circuit response.
8. Apply KVL, KCL and Ohm's to ideal op-amp circuits.

***Topics to be Covered*:**	***Duration in Weeks***
1. Operational Amplifiers (Chapter 5)	2
2. Magnetically Coupled Circuits (Chapter 13)	2
3. First order circuit (Chapter 7)	5

4.	series and parallel resonance (chapter 14)	1
5.	The Laplace Transform (Chapter 15)	1
6.	Applications of Laplace Transforms (Chapter 16)	2
7.	Fourier Series (Chapter 17)	2
8.	Fourier Transform (Chapter 18)	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: Dr. Mohamad Ajour
Last updated: Spring 2020