DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COURSE SYLLABUS

EE 312: Electronics II

COURSE TITLE	*CODE & NUMBER*	*SUBJECT AREA*	**Contact Hours**			**Credit Units**
			Th.	*Pr.*	*Tr.*	
Electronics II	**EE 312**	Engineering and Design	3	3		4
Pre-requisites:	EE 311					
Course Role in Curriculum *(Required/Elective):*	Elective Course					
Catalogue Description: Feedback in amplifiers. Frequency response of amplifiers. Operational amplifiers: design and applications as linear and non-linear analog building blocks, adders, subtractors, differentiators, integrators, analog simulation, and active filters. Logarithmic and exponential amplifiers, precision converters, analog multipliers, wave-shapers, sinusoidal and square wave oscillators.						

***Textbooks*:**
(Author, Title, Pub., year)

1. A. S. Sedra, and K. C. Smith, *Microelectronic Circuits,* Oxford University Press, USA, 7th Edition, 2015
2. M. H. Rashid, *Microelectronic Circuits: Analysis and Design*, Cengage Learning Inc., 3rd Edition, 2017

***Supplemental Materials*:** Lecture notes, slides, and solved examples

***Course Learning Outcomes*:**

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

1. Analyze the circuits with ideal Op-Amps
2. Design application circuits using ideal Op-Amps
3. Analyze and design Op-Amp circuits considering non-idealities of Op-Amp
4. Analyze and design analog active filters
5. Analyze and design different types of oscillators
6. Analyze and design frequency response of Op-Amp circuit
7. Analyze various types of feedbacks in amplifiers
8. Design and implement electronic circuit for practical application (Simulation & Hardware)
9. Setup experiments to measure and verify Op-Amp circuits

***Topics to be Covered*:**	***Duration in Weeks***
1. Ideal Op-Amp Circuit Analysis and Design	4
2. Non-Ideal Op-Amp Circuit Analysis and Design	2
3. Active Filters	3

4.	Oscillators	1
5.	Frequency Response of Op-Amp Circuits	1
6.	Feedbacks in Amplifiers	2
7.	Design and Implement Electronic Circuit for Practical Application	1
8.	Setup experiments to measure and verify semiconductor circuits	14

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. Sami Alghamdi
Last updated: Spring 2020