نموذج (هـ)

Summarized Course Description

Course number: ECE 445	Course name: Analog Integrated Circuits
لغة تدريس المقرر: English	Pre-requisites: ECE 342
Credit hours: 3 (**3-0-0**)	Course level: Level – 8 or 9

Course Description وصف المقرر :

Practice of integrated circuit design. Discrete vs Integrated circuits. Classes of chip design, chip partitioning, and architecture; Mixed mode integrated circuit devices and concepts. Advanced modeling and 2nd order effects of transistors and single stage amplifiers. Current mirrors and sources. Voltage and current references.
Design of transconductance amplifier. Design of input stages, differential pairs, active loads, gain stages and level shifting. Output stages, power dissipation. Analysis and design of typical opamp circuits.

Course objectives أهداف المقرر :

1. Analysis, design, and applications of modern analog circuits using integrated field effect transistor technologies.
2. Introduce the principles of analog circuits and apply the techniques for the design of analog integrated circuit (Analog IC's).

Course Outcomes مخرجات التعليم:

On successful completion this course, the student should be able to:

1. Describe the models for active devices in MOS and Bipolar IC technologies,
2. Describe layout considerations for active and passive devices in analog ICs,
3. Analyze and design single-ended and differential IC amplifiers,
4. Analyze and design IC current sources and voltage references,
5. Describe the noise sources and models applicable to ICs,
6. Analyze integrated circuit noise performance,
7. Analyze and design IC operational amplifiers,
8. Describe the operation of commonly used data conversion circuits, and
9. Design, simulate, lay out, and verify analog integrated circuit designs using a commercial CAD environment.

Textbook and references الكتاب المقرر والمراجع المساندة:

Text Book:

Razavi, Design of Analog CMOS Integrated Circuits, McGraw-Hill, 2016 2nd addition, ISBN 9780072524932

References:

P. Gray, P. Hurst, S. Lewis, R. Meyer, Analysis and Design of Analog Integrated Circuits by (More BJT) Wiley, 2009 5th addition.
Willy Sansen, Analog Design Essentials, Springer, 2006 1st addition.
Boylestad and Nashelsky, Electronic Devices and Circuit Theory, Pearson Highered 2012 11th addition.