



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Analog Integrated Circuits I

ECE 4021

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lecture

Course Description:

Fundamentals of analog integrated circuits. CMOS transistors and diodes large-signal and small-signal operation and modeling. On-chip passive components operation and modeling. Simple and advanced current mirrors, single-ended and differential CMOS amplifiers, CMOS OTAs and Op-Amps. Integrated Circuits Fabrication, Packaging, and Testing.

Prerequisites and Co-requisites:

Prereq: 3020.

Course Goals / Objectives:

- Be competent in the voltage and current characteristics of on-chip resistors, capacitors, and transistors
 - Be familiar with the integrated circuit physical structure, fabrication flow, and layout
 - Be competent in conducting large-signal and small-signal analysis of integrated CMOS transistors, current mirrors, and amplifiers
 - Be competent in the design and analysis of various classes of current mirrors and amplifiers
 - Be competent in the use of modern integrated circuit design CAD tools and in performing AC, DC, and transient simulations
 - Be competent in writing design reports
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Course Topics:

- Introduction to analog signal processing and analog integrated circuits technology
 - Integrated circuits physical structure and interconnects
 - Integrated Circuits layout and CAD flows
 - Diodes operation and modeling
 - CMOS transistors large-signal operation and modeling
 - CMOS transistor small-signal operation and modeling
 - CMOS current sources and mirrors
 - CMOS single-ended amplifiers
 - CMOS differential pairs
 - CMOS Single-ended OTAs and Opamps
 - On-chip passive components in integrated circuits
 - Integrated circuits fabrication flow, packaging, and testing
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Designation:

Elective