

# ENGI 4136: Analogue Integrated Circuits — Fall 2007

3 hour lectures and 1.5 hour laboratory per week  
Lakehead University — Faculty of Engineering  
Department of Electrical Engineering

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**Class Web Site:** <http://vision.lakeheadu.ca/eng4136/>

**Textbook:** Richard R. Spencer and Mohammed S. Ghausi, "Introduction to Electronic Circuit Design," Prentice Hall, 2003, ISBN 0-201-36183-3.

## 1 Course Objectives

Introduce the student to the analysis and design of analogue circuits. By the end of the course, the student should be able to do the following things:

- Design circuits using operational amplifiers as building blocks.
- List characteristics of basic amplifier stages. Describe the principles of some common integrated circuit blocks.
- Design amplifiers for a specified frequency response.
- Design voltage regulators and power amplifiers starting from known circuit topologies.
- Calculate the amount of noise in a circuit. Apply some techniques to reduce noise.
- Use a circuit simulation program to verify and tune designs.
- Design, build and test an analogue circuit.

## 2 Topics

Week No.	Topic Discussed	Book Chapter
1-2	Electronic circuit design concepts. Basic amplifier stages.	1, 8
3	Differential pairs. Current mirrors. Active loads.	8, 7
4-6	Operational amplifier principles and applications. Voltage regulators. Logarithmic and exponential amplifiers.	5, 10
7-8	Frequency response.	5, 9
9-10	Noise in analogue circuits.	(class notes)
11	Power amplifiers.	12
12	Nonlinear analogue circuits: multipliers, PLLs.	(class notes)

*Note: The instructor reserves the right to modify the above outline depending on class progress.*