

ELC 383/Electronics II
Spring Semester

2014-15 Catalog Data:	ELC 383/Electronics II (with design hour) <i>Prerequisite:</i> ELC 251	1 course unit
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The continuation of ELC 251 covering the analysis and design of electronic circuits and systems: small-signal analysis, cascode amplifiers, active biasing, current mirrors, frequency response, power amplifiers, CMOS digital logic gates, active filters, switched capacitors, non-linear op-amp applications, and oscillators.

Textbook:

Microelectronic Circuits, 7th Edition by Abel S. Sedra and Kenneth C. Smith, Oxford University Press, 2014. ISBN-13: 978-0199339136

Course Objectives:*

- Objective 1: To analyze and design IC amplifier stages using bipolar-junction transistor (BJT) and field-effect transistor (FET) technologies. [a, c, e, k]
- Objective 2: To analyze the frequency response of transistor amplifiers. [a, e]
- Objective 3: To analyze linear and non-linear op-amp circuits. [a, e, k]
- Objective 4: To design digital logic gates using CMOS technology. [a, e, k]

Topics Covered:

1. Transistor amplifier design
2. Current sources and current mirrors
3. Analysis of the basic gain cell
4. Cascode amplifiers
5. Differential amplifiers
6. Frequency response of transistor amplifiers
7. Switching circuits and CMOS digital logic
8. Active filters
9. Switched capacitors
10. Multivibrator oscillators
11. Non-linear op-amp circuits

Evaluation:

- A. Quiz 1
- B. Quiz 2
- C. Final Examination
- D. Design assignments

Performance Criteria:**

Objective 1:

Student will be able to design and analyze MOS and BJT IC amplifier stages. (A, D)

Objective 2

Student will be able to analyze the frequency response of transistor amplifiers. (B)

Objective 3:

Student will be able to analyze linear and non-linear op-amp circuits. (C, D)

Objective 4:

Student will be able to design digital logic gates using CMOS technology. (B)

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*Lower case letters in brackets refer to the student outcomes of the Electrical/Computer Engineering Programs

**Upper case letters in brackets refer to the evaluation methods used to assess student performance