**ELC 383/Electronics II**

Spring Semester

2014-15 Catalog Data: ELC 383/Electronics II 1 course unit

(with design hour)

*Prerequisite:* ELC 251

The continuation of ELC 251 covering the analysis and design of electronic circuits and systems: biasing, small-signal analysis, frequency response, feedback amplifiers, active filters, non-linear op-amp applications, and oscillators.

**<LP suggestion for new bulletin description:>**

**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, 6th Edition by Abel S. Sedra and Kenneth C. Smith, Wiley 2003

**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. Review of Electronics I
2. Analysis of the basic gain cell
3. Cascode amplifiers
4. Current sources and current mirrors
5. Differential amplifiers
6. Frequency response of transistor amplifiers
7. BJT power amplifiers
8. CMOS digital logic
9. Active filters
10. Switched capacitors
11. Non-linear op-amp circuits
12. Multivibrator oscillators

**Evaluation:**

A. Quizzes/Examinations

B. Design Project Reports

**Performance Criteria:\*\***

Objective 1: Students will be able to analyze and design single stage IC amplifiers. [A, B]

Objective 2: Student will be able to analyze the frequency response of transistor amplifiers. [A]

Objective 3: Student will be able to analyze linear and non-linear op-amp circuits. [A]

Objective 4: Student will be able to design digital logic gates using CMOS technology [A]

**Contribution of course to meeting the professional component:**

Engineering Science: 70%

Engineering Design: 30%

**Prepared by:** Larry Pearlstein, Ph.D., Associate Professor **Date:** June 2015

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

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