

EE-4232 Electronic Applications

Curricular Designation: CpE: Elective EE: Elective

Catalog Description: Study of electronic circuits under small- and large-signal conditions. Typical topics include analysis and design of power and RF amplifiers, feedback circuits, oscillators, timing circuits, Schmitt triggers, non-linear models of semiconductor devices, the factors that limit switching speed, the switching of reactive elements, and DC-DC converters. *Credits: 3.0 Lec-Rec-Lab: (0-3-0)*
Semesters Offered: Spring Prerequisites: EE 3130

Textbooks(s) and/or Other Required Materials:

1. Allen Hambley, *Electronics*, Second Edition, Prentice Hall, 2000. *OR*
Adel Sedra and Ken Smith, *Electronic Circuits*, Fourth Edition, Oxford University Press, 2000.
2. CAD tool P-Spice and its user manual.

Prerequisites by Topic:

1. Familiarity with the physics and operational characteristics of electronic devices such as diodes, operational amplifiers, BJTs and MOSFETs.
2. Familiarity with circuit simulation and analysis using P-Spice.

Course Objectives:

1. Familiarity with designing and analysis of electronic circuits such as differential amplifiers, output stages, oscillators and waveshaping circuits using BJTs and MOSFETs.
2. Familiarity with feedback concepts and the various feedback topologies.
3. Application of a CAD tool such as P-Spice for the simulation and analysis of electronic circuits.

Topics Covered:

1. Review of BJTs, JFETs and MOSFETs.
2. Differential Amplifiers using BJTs and MOSFETs, Biasing Techniques, Multistage Amplifiers.
3. Output Stages, Biasing, Power Amplifiers.
4. Feedback Amplifiers, Feedback Topologies, Stability Problem.
5. Oscillators
6. Waveshaping Circuits, Comparators, Multivibrators
7. Application of P-Spice to the simulation and analysis of various electronic circuits.

Relationship of Course to Program Outcomes (See UPAC SOP, Tables 1 and 2):

- **EE:** Outcome: a via topic(s): 2, 3, 4, 5, 6
Outcome: c via topic(s): 2, 3, 6
Outcome: k via topic(s): 7
- **CpE:** Outcome: a via topic(s): 2, 3, 4, 5, 6
Outcome: c via topic(s): 2, 3, 6
Outcome: k via topic(s): 7

Contribution of Course to Meeting the Professional Component:

- **EE:** Engineering Topics
- **CpE:** Engineering Topics

Class/Laboratory Schedule (note: 1 hour = 50 minutes):

Lecture: 45 hours = 3 hours/week for 15 weeks

Prepared by:

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