

1. Course number and name

EE 311: Electronics

2. Credits and contact hours

3.0 (three lecture hours per week)

3. Instructor's or course coordinator's name

Subhanshu Gupta

4. Textbook, title, author, and year

A. Sedra and K. C. Smith. 2010. *Microelectronic Circuits* (7th ed.). Oxford University Press.
ISBN-13: 978-0195323030.

Other supplemental materials

Instructor notes/slides will be provided for some topics.

5. Specific course information

6. *Catalog Description*: Fundamental device characteristics including diodes, MOSFETs and bipolar transistors; small- and large-signal characteristics and design of linear circuits.

7. *Prerequisites or corequisites*: Certified in the EE. By course: EE 261 with grade of C or better. By topic: KCL, KVL, basic circuit analysis including DC, AC, and transient analysis. Courses that require this as a prerequisite: EE 352, EE 476/576,

8. *Required, elective, or selected elective*: Required for BS CptE/BSEE majors.

9. Specific goals for the course

By the end of this course, students will be able to:

- Understand fundamentals of PN Junction Diodes, MOSFETs and Bipolar Transistors to electronic circuit designs (1a, 1b, 1c, 1d, 1e, 2a, 2b, 2c, 2d)
- Understand small- and large-signal characteristics Diodes and Transistors (1a, 1b, 1c, 1d, 1e)
- Design and simulate linear circuits in Cadence and Matlab (6a, 6b, 6d, 6e)
- Map theoretical concepts into experimental designs in simulation environment (6a, 6b, 6d, 6e)

10. Brief list of topics to be covered

- Signals and Amplifiers,
- Operational Amplifiers,
- Semiconductors and Diodes,
- MOSFETs,
- MOSFET small- and large-signal characteristics,
- BJTs,
- BJT small- and large-signal characteristics,
- Single-stage amplifiers,
- Frequency Response,
- Differential- and multi-stage amplifiers.