

ECE 580A5 – Fall 2011

Semiconductor Transistors- Syllabus

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Meeting time: Tuesdays and Thursdays, 2:00 – 3:20, Wagar 232
Oct. 31 - Dec. 11

Course website: TBA

If you are unable to log into RamCT, contact the ACNS helpdesk for support.

Prerequisites: ECE 341 or equivalent, ECE481B

Office hours: contact me by email to schedule office hours.

Course Objective(s): This course is suitable for undergraduate seniors and first year graduate students majoring in engineering or physics. It introduces bipolar transistor and the metal oxide semiconductor field effect transistor.

Text: “Semiconductor Physics and Devices”, 3rd ed., by D. Neamen, McGraw-Hill

Description: Operation of basic transistor devices: bipolar transistor and MOSFET.

Topics to be covered:

- Week 1 (Neaman Ch. 10) Operation of the bipolar transistor, minority carrier distribution, common-base current gain.
- Week 2 Nonideal effects in bipolar transistors, Ebers-Moll equivalent circuit, frequency limitations.
- Week 3 (Neaman Ch. 11,) Energy band diagram of MOS capacitor.
- Week 4 MOS C-V characteristics. MOSFET operation.
- Week 5 (Neaman Ch. 12,13) Frequency limitation of the MOSFET. Operation of the JFET.

Method of evaluation: One exam: 50%, Homework: 30%, Quizzes: 20%

A+ = 98-100

A = 94-97

A- = 90-93

B+ = 87-89

B = 84-87

B- = 80-83

C+ = 76-79

C = 65-75

D = 50-64

F = 0-49

Final exam is closed book, but you are allowed to bring one sheet of notes (front and back). Homework is typically due at the start of class on a Thursday one week after it is assigned, but check the website for details and updates. I plan for there to be a new assignment every week. Quizzes will be given at the start of class once or twice a week. The quizzes may cover any portion of the material covered in class.

The course will adhere to the **Academic Integrity Policy** of the CSU General Catalog (page 7, <http://www.catalog.colostate.edu/FrontPDF/1.6POLICIES1112f.pdf>) and the Student Conduct Code (<http://www.conflictresolution.colostate.edu/conduct-code>)

The University is required to provide reasonable accommodations to students with disabilities, so as not to discriminate on the basis of that disability. Students with disabilities are encouraged to contact the instructors to discuss their individual needs for accommodations. Also, you may visit Resources for Disabled Students: <http://rds.colostate.edu/> or call them at (970) 491-6385.