EE 12: Intermediate Electronics

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Administrative

URL: www.ece.tufts.edu/ee/12
GROUP: http://groups.google.com/group/ee12tufts

1. Announcements, Course Information
2. Lecture notes, Quizzes, Labs will be posted on this page
3. Useful links, text references, Calendar
4. Anonymous feedback form.

Office Hours:
Sameer Sonkusale
231A Halligan  Tuesdays 2-3pm
Saroj Rout
125 Halligan  M-W 2:30-4:00pm
Text/References

• The course will primarily be based on lecture notes. EE 12 workbook will be a guide for material. The classic Gray/Hurst/Lewis/Meyer is indispensable and highly recommended.

• Text:
  1. Lecture Notes
  2. EE 12 Workbook by Dr. Denis Fermental
  3. Electronics by Alan R. Hambley

• References:
Course Content

Topics to covered:
Bipolar Device Physics
BJT Models: Hybrid-p Model
Network Equations and Mason's Flow Graphs
Transistor Amplifiers: Emitter Follower, Darlington Amplifier and two transistor Amplifier
Oscillators: RC and LC Oscillators, Amplitude Modulation
Power Amplifier: Class A and Class B
Course Content (cont.)

Laboratory Projects:
1. Properties of an Operational Amplifier
2. The Two Transistor Amplifier
3. An RC Oscillator
4. An LC Oscillator
5. A Complex Analog Building Block (eg. Modulator)

Laboratory Reports: Each student will have a partner and a single project report will be submitted. Details regarding the report is available in the workbook.
Course Content (cont.)

Quizzes and Exams:
• There will be a biweekly quiz on Wednesday
• One Midterm Exam (TBA)
• Final Exam (tentative May 5th, 2008)

Homework:
• Homework exercises will be assigned each Monday and are due the following Monday.
• Collaboration among students is encouraged but not plagiarism.
• Each student must submit a separate completed assignment with names of any collaborators on the front page.
Course Objective

- An extension of EE 11. The course material has been selected to provide a broad background in analog structures with the intent of giving the student a firm foundation in the techniques of analog circuit analysis and design, and insight into how complex analog circuits operate.

- More importantly, it's a first step towards building a foundation as an Analog IC Design Engineer in a very competitive industry.

- It doesn't necessarily limit you to IC design, the same conceptual framework is used for board-level design too.

- The course includes project based learning - the laboratory exercises are supposed to complement the in-class instructions.
Grading

Homeworks: 10%
Quizzes: 15%
Laboratory: 25%
Midterm: 20%
Final: 30%

- Remember all homework and labs must be submitted on time. There is no credit if it is late.
- You still need to submit your lab even if it is late to get a letter grade
Some Analog Building Blocks

1. Operational Amplifiers
2. Oscillators
3. Filters
4. Analog to Digital Converters
5. Digital to Analog Converters
6. Frequency Synthesizers
7. Modulators and Demodulators
8. Transceivers
9. Sensor Interface Circuits
Analog and Mixed Signal

Continuous Time

Digital

Sampled Data or Discrete Time
Notation for Signals