INTRODUCTION TO INTEGRATED CIRCUITS

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Grading:
- Three exams (each 20%)
- Weekly homework (10%)
- Seven laboratory reports (15%)
- Group project and in-class quizzes (15%)

Course Outline: subject to change at any time

1. Introduction – Chapter 8 + lecture notes (11 lectures + exam)
   - Overview of design concepts for analog and mixed signal circuits
   - Circuit analysis and s-domain review
   - Device models and transistor biasing
   - Mid-band analysis and small-signal models
   - Single BJT and MOSFET amplifiers

EXAM 1 – Material through Chapter 8 + lectures, Thursday September 29.

2. Differential amplifier stages – Chapter 11 + lecture notes (5 lectures)
   - Differential amplifier concepts
   - Large signal analysis
   - Small signal analysis
   - Active loads
   - Current sources

3. Bandwidth considerations of linear amplifiers – Chapter 10 (3 lectures)
   - Time constants
   - Example circuit analysis
   - High frequency transistors in integrated circuits

EXAM 2 – Material through Chapter 11 + lectures, Tuesday November 8.

4. Multistage amplifiers – Chapter 9 + lecture notes (5 lectures)
   - Analysis techniques
   - Direct and capacitively-coupled amplifiers
   - Operational amplifier specifications and design
   - Technology considerations

5. Logic circuits – Chapter 5 + lecture notes (4 lectures)
   - Logic circuitry overview
   - CMOS and NMOS/PMOS inverters
   - Bipolar inverters in TTL and ECL
   - Memory cells, latches
   - Memory arrays and register files
   - Switching speed

FINAL EXAM – Comprehensive. Check day and time in final exam schedule.

The course policy for making up a graded exercise missed due to a short-term illness will be consistent with the University policy.