

ECE 342 Syllabus

1. Review: Circuit analysis techniques
2. MOSFET large-signal model
3. DC analysis of circuits containing MOSFETs
4. Introduction to digital circuits
5. Static characteristics of CMOS inverter
6. CMOS inverter: parasitic capacitances
7. CMOS inverter: switching delay
8. CMOS logic gates
9. Power dissipation in logic gates
10. Diode models: exponential, PWL
11. DC analysis of circuits containing diodes (e.g. rectifiers)
12. BJT large-signal model
13. DC analysis of circuits containing BJTs
14. Amplifier models
15. Frequency response of amplifiers
16. Small signal modeling: the motivation
17. MOSFET small-signal model for low-frequencies
18. BJT small-signal model for low-frequencies
19. Biasing the common emitter (CE) amplifier
20. Midband gain, input resistance, and output resistance of the CE amp
21. *Emitter degeneration*
22. Biasing the common source (CS) amplifier
23. Midband gain, input resistance, and output resistance of the CS amp
24. Continuation of previous topic
25. High frequency model of BJT; Miller's Theorem
26. High frequency model of MOSFET
27. Frequency dependent gain of CE amplifier
28. Continuation of previous topic
29. Frequency dependent gain of CS amplifier
30. Midband and high frequency analysis of emitter follower
31. Midband and high frequency analysis of source follower
32. *Common base and common gate amplifiers*
33. *Continuation of previous topic*
34. MOS and bipolar current sources
35. Active load
36. Introduction to the differential pair
37. *Ideal op-amp*
38. *Op-amp applications and introduction to feedback*
39. *Continuation of previous topic*
40. *Applications of electronic circuits*

41. Midterm exam #1
42. Midterm exam #2

Topics listed in italics are not prerequisite for 400-level classes in the circuits area. These topics may be skipped at the instructor's discretion if s/he is pressed for time or wishes to substitute an alternate topic.