

ELEG 4243 - ANALOG INTEGRATED CIRCUITS

Spring Semester, 1996

Catalog Data: ELEG 4243. Analog Integrated Circuits. 3 credit hours. Theory and design techniques for linear and analog integrated circuits. Current mirrors, voltage to base emitter matching, active loads, compensation, level shifting, amplifier design techniques, circuit simulation using computer-assisted design programs, Prerequisites: ELEG 3223 and ELEG 4203.

Textbook: Abel S. Sedra and Kenneth C. Smith, Microelectronic Circuits, Saunders College Publishing, 1991

References: Paul R. Gray and Robert G. Meyer, Analysis and Design of Analog Integrated Circuits, 3rd edition, John Wiley and Sons, 1993.
Phillip E. Allen and Douglas R. Holberg, CMOS Analog Circuit Design, Holt, Rinehart and Winston, 1987.

Coordinator: J. R. Yeargan, University Professor.

Goals: To acquaint the students with some of the circuit design techniques used in integrated circuit design such as parameter matching, emitter sizing. Also to study and analyze some of the basic subcircuits as realized using Bipolar Junction Transistors and MOSFETs.

Prerequisites by Topics:

1. Characteristics of BJTs and MOSFETs
2. Single stage amplifiers
3. Differential Amplifiers
4. Frequency Response of Amplifiers
5. Feedback Amplifiers

Topics:

1. Class A output stages
2. Class AB output stages
3. Power and efficiency of output stages
4. Biasing the output stage
5. Temperature derating of IC amplifiers
6. MOS power transistors
7. DC analysis of the 741 opamp
8. Small-signal analysis of the 741 opamp
9. D/A converter circuits
10. A/D converter circuits
11. Filter types and specifications
12. Butterworth and Chebyshev Filters
13. First and Second order filter functions
14. Biquadratic Active Filters
15. Switched Capacitor Filters
16. Sources of noise in transistor amplifiers
17. Noise analysis of transistor amplifiers
18. Oscillators
19. Waveform generating circuits
20. Phase Locked Loops
21. Exams

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Computer Usage:

Homework and design projects using PSPICE

Laboratory:

No laboratory component at present

Estimated Content:

Engineering Science:	1 credit hour or 33%
Engineering Design:	2 credit hours or 67%

Prepared by: _____

Date: _____