

Department	Electrical and Computer Engineering
Course Number	EE 411
Course Title	Advanced Analog Electronics
Course Designation	Elective
University Catalog Description	Semesters offered: S; Prerequisites: EE 317 -- This course covers differential and multistage amplifiers, frequency response, feedback, analog integrated circuits, filters, and tuned circuits, analog to digital and digital to analog conversion, noise in electronics, current topics.
Faculty Coordinator	James P. Becker
Prerequisites by Topic	Diodes, BJT and FET amplifiers, op amp circuits, network theory, Bode plots
Textbook	<i>Microelectronic Circuit – 5th edition</i> , Oxford University Press, A. S. Sedra and K.G. Smith, 2004.
Course Objectives	To produce graduates who are capable in the analysis and design of discrete analog circuits including multistage amplifiers and active filters.
Course Learning Outcomes	At the conclusion of EE 411, students are expected to be able to: 1) Analyze and design multistage amplifiers to achieve a specified gain and bandwidth 2) Identify and analyze feedback amplifiers according to their topology 3) Design active filters to meet specification 4) Identify the stages of a 741-op amp from its circuit schematic and to articulate the purpose of each stage 5) Breadboard, troubleshoot and successful test project circuits
Topics Covered	1) Device structure and modeling of the MOSFET and BJT 2) Design of simple and augmented current mirrors 3) Analysis and design of differential pair amplifiers 4) Frequency response concepts (short circuit and open circuit time constant techniques) 5) Multi-stage amplifier design 6) Class A, class B and class AB output stages 7) Basic properties, configurations and stability of feedback circuitry 8) Active filter design using first and second order cascades 9) Single-parameter sensitivity analysis 10) Wien-bridge oscillator
Class/Laboratory Schedule	EE 411 meets three times/week for 50 minutes.
Professional Component (Criterion 5)	This course strongly supports the use of engineering fundamentals to analyze and design basic analog circuitry
ECE Program Outcomes	EE 411 supports the following Program Outcomes: c. An ability to design a system, component, or process to meet desired needs g. An ability to communicate effectively. k. An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.
Total Credit Hours	3
Prepared by	James Becker 5/20/09