Department	Electrical and Computer Engineering
Course Number	**EE 317**
Course	Linear Electronics I
Course Designation	Required
University Catalog Description	Semesters offered: F,S 3 credit lecture, 1 credit lab Prerequisite: EE 207. This is the first course in linear electronics. It covers: two port networks, non-ideal operational amplifiers, diodes, bipolar transistors, field effect transistors, and bipolar and MOS digital circuits.
Faculty Coordinator	Dr. David Dickensheets
Prerequisites by Topic	Linear circuit analysis, Kirchoff's current and voltage laws, node and loop analysis, RC network natural and forced response, Thevenin and Norton equivalents, ideal op-amps
Textbook	"Microelectronic Circuits," 5th edition, Sedra and Smith, Oxford 1998.
Course Objectives	To produce graduates with an understanding of two-port network analysis in both time and frequency domain, who understand ideal and some non-ideal behavior of electronic devices including op-amps, diodes and transistors, and who have been exposed to modern techniques for circuit simulation and measurements.
Course Learning Outcomes	At the conclusion of EE 317, students are expected to: 1) Be familiar with two-port concepts such as input and output impedance, voltage and current gain, transresistance and transconductance. 2) Understand first order behavior of operational amplifiers, p-n junction diodes, BJTs and FETs. 3) Evaluate simple electronic circuits to determine DC bias conditions and AC behavior. 4) Be able to use SPICE to simulate simple electronic circuits to evaluate DC bias conditions and AC behavior. 5) Be able to construct simple electronic circuits in a laboratory setting and measure DC bias and AC behavior using modern test and measurement tools.
Topics Covered	1. operational amplifier device properties 2. operational amplifier circuits 3. *pn* junction diode forward and reverse I-V characteristics 4. zener diodes and applications 5. spice modeling of *pn* junction diodes 6. field effect transistor (FET) 7. FET dc biasing 8. FET modeled as a two-port device 9. FET ac analysis 10. spice modeling of FET circuits 11. integrated circuit MOSFET circuit design concepts 12. bipolar junction transistor (bjt) 13. bjt dc biasing 14. bjt modeled as a two-port device 15. bjt ac analysis 16. common emitter, common base and common collector configurations 17. spice modeling of bjt circuits 18. output stage amplifiers 19. CMOS and TTL logic building blocks 20. CMOS and TTL properties
Class/Laboratory Schedule	Lecture 3 times per week for 50 minutes, laboratory 1 time per week for 1 hour 50 minutes.
Professional Component	This course develops and reinforces electronic circuit analysis and synthesis principles, and supports engineering practice including computer simulation tools and test and measurement principles.

ECE Program Outcomes	EE 317 supports the following Program Outcomes: a. An ability to apply knowledge of mathematics, science, and engineering. b. An ability to design and conduct experiments, as well as to analyze and interpret data. g. An ability to communicate effectively. k. An ability to use the techniques, skills and modern engineering tools. p. An ability to analyze electrical and electronic system. r. An ability to analyze and synthesize electronic devices and electrical systems
Total Credit Hours	4
Prepared by	D. Dickensheets, 5/09