Credit
4 semester hours
3 class hours in Lecture per week, 3 hours in Lab per week

Prerequisite
ESC 305

Course Description
Semiconductors, solid-state electronics, principles of active devices, JFET's, amplifier circuits, operational amplifiers, analog measurements, oscillator circuits, linear integrated circuits.

Rationale for Course
In general, the study of physics gives students an in-depth understanding of the fundamental principles that govern the physical world around us, and a set of cognitive and technical skills which include thinking analytically, defining and solving problems, and collecting and analyzing and interpreting data. This course provides a background for analyzing and designing solid-state electrical circuits which form the basis for the advanced electronic technology used in today's measurement, communication and computing equipment.

Learning Objectives
- The student will become familiar with the intrinsic properties and characteristics of semiconductor devices such as diodes and transistors.
- The student will become proficient in the use of modeling techniques to analyze and design circuits containing diodes and transistors.
- The student will become proficient in the use of bias point curves to design analog electronic circuits.
- The student will learn to use electronic circuit elements for the design of digital logic circuits.

Academic Integrity
Students are expected to be honest and to submit their own work on exams and research papers. Adherence to the Mississippi College "Honesty Policy" (2009-2010 *Mississippi College Undergraduate Bulletin, pg. 60*) will be followed.

Course Outline
- Semiconductor Materials and Diodes
- Diode Circuits
- Bipolar Junction Transistor (BJT)
- BJT Amplifiers
- Field Effect Transistor (FET)
- FET Amplifiers
- Frequency Response
- Digital Electronics

Method of Instruction

Class will consist primarily of presenting fundamental physics concepts and working problems. Key points will be highlighted by the choice of problems, and these points will be discussed in the context of the problem.

Required Textbook

Electronic Circuit Analysis and Design, Donald Neamen, published by Irwin.

Grading

The final average will be computed as follows: 50% tests/quizzes, 10% homework, 20% lab, 20% final exam. The final exam is comprehensive. Lab points will be determined based on lab report grades (see Circuits Lab Policies and Procedures handout).

Scale:	Grade	Final Average
	A	90–100
	B	80–89
	C	70–79
	D	60–69
	F	0–59

Makeup Tests

Makeup tests will be given only under the following circumstances:

- Consent of the instructor has been obtained prior to the test.
- An excused absence is obtained from a doctor or the Vice-President for Academic Affairs.

Computer Usage

Homework and lab assignments using PSPICE, Electronics Workbench, and/or Altium Designer.

Absences

Mississippi College policies on attendance and academic integrity will be enforced. Please see the 2009-2010 *Mississippi College Undergraduate Bulletin, pg. 56-57* for additional details of these policies. Students are responsible for work missed during an absence.

Special Needs: If you need special accommodations due to learning, physical, psychological or other disabilities, please contact Dr. Buddy Wagner in the Counseling and Career Development Center. He may be reached by phone at (601) 925-3354.