

12/11/14	DATE	Technology	DIVISION
	REQUIRED COURSE		NEW COURSE
	ELECTIVE COURSE	X	REVISION

LAKE LAND COLLEGE

Course Information Form

COURSE NUMBER	<u>MET080</u>	TITLE	<u>Solid State Devices and Applications</u>
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SEM CR HRS	3	LT HRS	2	LAB HRS	2	SOE HRS	ECH
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COURSE PCS# (Assigned by Administration)

Prerequisites: MET 042 or EET 050

Catalog Description (40 Word Limit):

Provides the student with a basic understanding of the most frequently used discrete semiconductors. Analog and digital integrated circuits also are studied.

List the Major Course Segments (Units)	Lt Hrs	Lab Hrs
Tuned Circuits and RCL Networks		
Introduction to Semiconductors and Power Supplies		
Tubes, Transistors, and Amplifiers		
Integrated Circuits		

EVALUATION:	Quizzes	X	Exams	X	Oral Pres	Papers
	Lab Work	X	Projects		Comp Final	Other

Textbook: Title: Electricity & Electronics

Author: Gerrish, Dugger, Roberts

Publisher: Goodheart Willcox Co. Inc.

Volume/Edition: 10th

Copyright Date: 2009

Major Course Segment	Hours	Learning Outcomes
Tuned Circuits and RCL Networks		* Explain resonant frequency and how it affects various RCL circuits. * Calculate a resonant frequency. * Discuss the characteristics of a series RCL circuit at its resonant frequency. * Discuss the characteristics of a parallel RCL circuit at its resonant frequency. * Calculate circuit Q and bandwidth. * Describe filtering action. * List four types of filters and explain their action.
Introduction to Semiconductors and Power Supplies		* Define electronics. * Explain the doping process. * Explain how N-type and P-type materials are made. * Discuss how N-type and P-type materials conduct electrical energy. * Explain forward and reverse biasing. * Discuss various types of semiconductor diodes. * Explain the operation of a half-wave and full-wave rectifier. * Explain power supply filtering. * Explain power supply load characteristics. * Outline various methods for regulating voltage. * Discuss methods for raising voltages. * Construct simple power supplies.
Tubes, Transistors, and Amplifiers		* Explain the operation of the vacuum tube. * Describe the workings of a cathode ray tube. * Explain the operation of the bipolar transistor. * Explain the operation of field-effect transistors. * Discuss different biasing techniques. * Identify various transistor circuit configurations. * List the components of amplifier circuits and give the function for each component. * Explain the amplifier operation. * Compute the gain of amplifier circuits. * Perform dc load line analysis on a transistor circuit. * Discuss the advantages and disadvantages of various methods of amplifier coupling. * Describe several common thyristors.

Integrated Circuits

- * Define integrated circuit (IC).
- * Give a brief history of the IC.
- * Discuss the construction of an IC.
- * Illustrate the steps in construction of an IC.
- * Explain the operation of the operational amplifier.
- * Explain the operation of the 555 timer.

Course Outcomes: At the successful completion of this course, students will be able to:

- Perform circuit analysis and troubleshooting skills on rectifier circuits.
- Explain the operation, design, and assemble a functioning amplifier circuit.