



MASTER COURSE OUTLINE

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COURSE TITLE

Electronics I - Principles

GENERAL COURSE INFORMATION

Dept.: IST

Course Num: 221

(Formerly:)

CIP Code: 46.0302

Intent Code: 21

Program Code: 784

Credits: 5

Total Contact Hrs Per Qtr.: 77

Lecture Hrs: 33

Lab Hrs: 44

Other Hrs:

Distribution Designation:

COURSE DESCRIPTION (as it will appear in the catalog)

The course is an introduction to principles and applications of analog and digital electronic devices, circuits, and systems.

PREREQUISITES

IST 106 or Instructor Permission

TEXTBOOK GUIDELINES

Appropriate textbook as determined by faculty (Example: *Grob's Basic Electronics*, by Mitchel E Schultz)

COURSE LEARNING OUTCOMES

Upon successful completion of the course, students should be able to demonstrate the following knowledge or skills.

- 1) Demonstrate electrical safety practices required for electronics troubleshooting.
- 2) Evaluate electronic circuits for proper operation using oscilloscopes, and digital meters.
- 3) Explain basic principles of operation for solid state circuitry.
- 4) Explore & explain operation of circuits used in today's industrial processes.

INSTITUTIONAL OUTCOMES

COURSE CONTENT OUTLINE

- 1) Introduction:
 - a. Objectives
 - b. Electrical safety
 - c. DC and AC review
 - d. Trends in Electronics
- 2) Semiconductors
 - a. Concepts
 - b. N-Type
 - c. P-Type
 - d. P-N Junctions

- 3) Junction Diodes and Power Supplies
 - a. Rectification
 - b. D.C. Filtering
 - c. Regulation
 - d. Troubleshooting
- 4) Junction Transistors
 - a. Transistor action
 - b. Amplification
- 5) Small signal amplifiers
 - a. Measuring gain
 - b. Amplifier connection modes
 - c. Negative feedback
 - d. Frequency response
- 6) Large signal amplifiers
 - a. Class of operation
 - b. Class A
 - c. Class B & C
 - d. Switch-Mode
- 7) Operational amplifiers
 - a. Class of operation
 - b. Differential amplifiers
 - c. Setting Op-amp gain
 - d. Comparators
- 8) Troubleshooting Techniques
 - a. Preliminary Checks
 - b. No output
 - c. Reduced output
 - d. Distortion and noise
 - e. Intermittent
- 9) Oscillators
 - a. Oscillator characteristics
 - b. RC and LC circuits
 - c. Relaxation oscillators
 - d. Undesired oscillations
 - e. Troubleshooting
- 10) Radio systems
 - a. Modulation and demodulation
 - b. Heterodyne concepts
 - c. Troubleshooting
- 11) Integrated Circuits and Electronic control devices and Circuits

DEPARTMENTAL GUIDELINES *(optional)*

DIVISION CHAIR APPROVAL

DATE

