



MASTER COURSE OUTLINE

Prepared By: Ken Naime/Steve Matern

Date: June 2014

COURSE TITLE

Electronics II - Applications

GENERAL COURSE INFORMATION

Dept.: IST

Course Num: 222

(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)

Construct and analyze operation of analog and digital electronic devices, circuits, and systems using schematic diagrams, test equipment, and logical trouble shooting procedures.

PREREQUISITES

IST 221 or Instructor Permission

TEXTBOOK GUIDELINES

Appropriate textbook as determined by faculty (Example: *Electronics for Industrial Electricians*, by Stephen L. Herman)

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 troubleshooting in the industrial environment.
- 2) Evaluate electronic circuits for proper operation using oscilloscopes, and digital meters.
- 3) Explain basic principles of operation for industrial solid state circuitry.
- 4) Explore operation of circuits used in today's industrial processes.

INSTITUTIONAL OUTCOMES

COURSE CONTENT OUTLINE

Week 1: Introduction:

Objectives

Electrical safety

Test equipment familiarity

Constructor operation

Lab

Week 2: Semiconductors:

Construction.

Power rating and heat sinking

- P-N junction
- Operation
- Testing
- Light-emitting diode
- Lab

Week 3: Rectifiers

- Single phase
 - Half wave
 - Two diode
 - Bridge
 - Lab
- Polyphase
 - Half wave
 - Bridge
 - Average voltage calculations
 - Applications
 - Lab

Week 4: Filters

- Choke
- Capacitors
- Lab
- Zener diode
- Transistors
- History
- Identification
- Operation
- Testing
- Current flow
- Lab

Week 5: Transistor switch

- Operation & applications
- Transistor amplifier
 - Operation
 - Applications
 - Biasing
 - Lab

Week 6: Darlington amplifier

- Operation, industrial uses
- Construction
- Advantages
- Lab
- Field effect transistors
- FET, MOSFET, E-MOSFET

Operation

Testing

Lab

Week 7: Current generators

Function

Uses

Construction

Lab

Unijunction transistors

Construction

Applications

Testing

Lab

Week 8: SCR's

Operation

Construction

A/C and DC applications

Lab

Phase shifting

Lab

UJT Phase shifting for SCR's

Construction

Lab

SCR control of full wave rectifier

Construction

Lab

Week 9: Diac and Bilateral switch

Purpose

Construction

Operation

Lab

Triac

Purpose, applications

Operation

Testing

Lab

Phase shifting the Triac

Applications

Operation

Lab

Week 10) Methods of A/C voltage control

Applications

SCR operation

Triac

Thyristors

Lab

Week 11) Review and Final.

DEPARTMENTAL GUIDELINES *(optional)*

DIVISION CHAIR APPROVAL

DATE