University of Toledo
Electrical Engineering Technology
Master Syllabus

Course Title: Electronic Device Applications **Course Code & Number:** EET-2020

Credit Hour Total: 4 **Weekly Contact Hours Lecture:** 3 **Lab Hours:** 2

Prerequisite: EET-2010, Electronic Principles

Texts: Electronic Devices, Conventional Current Version, 9th Edition, Floyd, Prentice Hall. 2010

Software: None

Course Coordinator: Kamm

A. Course Description

This course covers principles and applications of electronic circuits and devices such as oscillators, power supplies, thyristors, regulators filters and operational amplifiers. It also exposes students to etching PCBs and soldering in the building and construction of an electronic signal generator. The Electronics Workbench simulation software is used for circuit analysis.

B. Related Program Outcomes:

ABET/ Student Outcomes

a. An understanding of the analytical and laboratory skills associated with electrical engineering technology, as evidenced by analyzing various IC based amplifiers and function generators in homework and exams.

b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science and technology, as evidenced by the use of mathematical equations to analyze electronic circuits in homework and exams.

c. An ability to conduct, analyze and interpret experiments concerning electrical engineering technology, as evidenced by data collection and analysis in lab reports.

EET Program Outcomes

None

C. Course Objectives:

1. To study basic characteristics of thyristors.

2. To study thyristor applications in level and phase controlled switching circuits and in inverter and converter circuits.
3. To study the basic operation of the ideal operational amplifier and their various configurations and applications.
4. To study the non-ideal characteristics of OP AMPS.
5. To study the operation and design of linear power supplies with IC voltage regulators.
6. To study the IC applications of sinusoidal and non-sinusoidal oscillators.
7. To study the design and applications of active filters.
8. To use math and science in deriving electronic devices models.
9. To learn electronic prototyping techniques.
10. To build and solder a PCB and construct an electronic signal generator.
11. To apply theoretical knowledge to applications in the lab.
12. To design and build projects in a team environment.
13. To enhance creativity through open-ended projects.
14. To integrate real life applications and latest technology into labs and projects.

D. Course Outline – Major Content Areas

- Introduction to Thyristors.
- Thyristors' Applications.
- Introduction to OP-AMP.
- OP-AMP Configurations.
- OP-AMP Applications.
- Voltage Regulators.
- Power Supplies.
- Oscillators.
- Signal Generators.
- Active Filters.
- Multivibrators
- Modulation/Demodulation.
- Phase Locked Loop.

E. Major Laboratory Topics

- The SCR.
- PSPICE analysis of SCR Phase Control.
- The UJT.
- The Photo transistor and Optical Coupler.
- Linear OP AMP Circuits.
- Comparators and Schmitt Triggers.
- Summing Amplifiers.
- Low Pass and High Pass Active Filters.
- Oscillators
- Signal Generator Project.