



Course Syllabus

Course: PHO K140 Optoelectronics
Credits: 4
Prerequisites: EET K105/6, MAT K137
Instructors: Dan Courtney – dcourtney@trcc.comnet.edu
Office Hours: As Posted – Office C134
Text: Science of Electronics – Analog, David Buchla & Thomas Floyd
Course Detail:

CRN	Cred	Title	Day(s)	Time	Date
11384	4	Optoelectronics	TR	09:30 am-10:45 am	01/19-05/16
10704	0	LAB, Optoelectronics	W	08:30 am-10:10 am	01/19-05/16

Course Description:

This course introduces semiconductor technology and devices, with an emphasis on optoelectronic devices, including LED's, laser diodes, and photodiodes. Analysis and design of circuits containing these devices will be covered, as will current applications. In the lab component, students will apply the concepts learned in the classroom and develop their skills in building electronic and optoelectronic circuits.

Course Topics:

Semiconductor Materials and Devices
PN Junction Physics
Diodes
Transistors
Optoelectronic Devices
Operational Amplifiers
Op Amp Circuits
Timer Circuits

Lab Topics

Volt-Ampere Characteristics
Linear Power Supply
LED/Laser Diode Driver Circuits
Photodiode Circuits
Amplifier Ckts
Operational Amplifiers
Timer Circuits



ABET Student Outcomes – Associate Degree Programs - 2011/2012

- a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;
- b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;
- c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;
- d. an ability to function effectively as a member of a technical team;
- e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;
- f. an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature;
- g. an understanding of the need for and an ability to engage in self-directed continuing professional development;
- h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
- i. a commitment to quality, timeliness, and continuous improvement.

TRCC EET Stated Outcomes

1. Students will practice the skills needed to work effectively in teams and as an individual.
2. Students will demonstrate the ability to use appropriate mathematical and computational skills needed for engineering technology applications.
3. Students will combine oral, graphical, and written communication skills to present and exchange information effectively and to direct technical activities.
4. Students will know of a professional code of ethics.
5. Students will describe concepts relating to quality, timeliness, and continuous improvement.
6. Students will describe how the concepts of electric circuits, electrical measurements, digital electronic devices, programmable logic circuits, electromechanical and automated systems, affect the design, maintenance, and operation of electrical systems.
7. Students will illustrate an ability to think critically and identify, evaluate and solve complex technical and non-technical problems; demonstrate creativity in designing problem solutions; and conduct and interpret experimental data and outcomes.
8. Students will recognize actions and acts of professionalism that allows them to become informed and participating citizens cognizant of ethics, civic duty, and social responsibility.
9. Students will recognize the need to be lifelong learners.

K140 Course Outcomes: The Course Outcomes are defined and assessed to determine the effectiveness of the course at meeting the course objectives.

1. Mastery of electronic and optoelectronic technology concepts as defined in this syllabus.
2. Knowledge of electrical quantities, units and relationships.
3. Demonstrate an ability to build and test electronic and optoelectronic circuits and systems.
4. Demonstrate an ability to analyze and solve problems relating to Optoelectronic systems.
5. Demonstrate oral and written communications skills.
6. Demonstrate an appreciation for lifelong learning.
7. Demonstrate proper professional and ethical behavior.



Course Format: Classes will consist of topic discussions, classroom exercises and laboratory exercises. Classes will move fluently between these activities.

Course Grading: Class Participation, Course Portfolio, Laboratory Skills.

Attendance/Timeliness: Attendance is mandatory at all class and lab sessions. Tardiness of attendance and/or assignments will have a significant negative impact on grading.

Course Portfolio:

The Course Portfolio will be a major component of a student's grade. The Portfolio consists of a 3 ring binder with dividers. All class materials will be filed in the Portfolio. Course activities will consist of topic discussions, in class assignments, laboratory exercises, homework and reports.

During a class discussion, the instructor will record the notes from the discussion on the white board. Students will transcribe the notes into their individual portfolios. The instructor will also distribute supplementary materials which will also be filed in the portfolio. In class assignments, homework, laboratory and other reports will also be filed in the portfolio.

Portfolio Grading Factors: Completeness, Presentation, Timeliness

Portfolio Grading Frequency – Mid Term & Final

Portfolio Physical Requirements:

3 Ring Loose Leaf Binder (1" or greater)

3 Hole Punched 8 ½ X 11 Lined Filler Paper – No Spiral Bound Notebooks or Paper

Divider Tabs

Portfolio Sections:

Class Notes

Handouts

In Class Assignments

Lab Reports

Homework

Other

Other Required Course Materials:

Straight Edge

Scientific Calculator e.g. TI-30 – Calculators should be available at all times during classes.