Three Rivers
COMMUNITY COLLEGE

Course Syllabus

Course: **PHO K230 Laser Electronics**

Course Detail:

CRN	Subj	Course	Credit	Title	Day	Time	Date	Location
31465	PHO*	K230	4.00	Laser Electronics	TR	11:00 am-12:15 pm	08/26-12/20	KTRCC B213
31466	PHO*	K230	0.00	LAB, Laser Electronics	W	01:00 pm-02:40 pm	08/26-12/20	KTRCC B213

Prerequisites: **EET K134/5 or PHO K140 and EET K105/6**
Instructor: **Dan Courtney – dcourtney@trcc.commnet.edu**
Office Hours: **As Posted – C134**
Text: **The Science of Electronics – Analog, David M. Buchla & Thomas L. Floyd**

Course Description:

This course will focus on the design and analysis of electronic circuits and devices of particular interest to the field of photonics. Laser Systems will be used basic for exploring circuits used in Photonics application. The course will explore basic multistage amplifiers, power amplifiers, operational amplifiers and applications. Applications include signal processing, power supply and control systems for popular laser systems. Diode, gas, fiber, and other laser systems may be used for investigating specific applications of electronic circuits and systems. The lab portion of the course includes experiments and simulations to parallel the lecture.

Grading: Class Participation, Course Portfolio

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

Course Topics:

Course Overview
Laser Circuits & Systems Overview
Semiconductor Emitters and Detectors
Multistage, RF and Power Amplifiers
Operational Amplifiers
Op Amp Applications
Power Supplies
Control Systems
Active Filters
Laser Circuits & Systems Examples

Lab Topics:

Class Project
Laser and Photodiode circuits
Multistage Amplifiers
Power Amplifiers
Op Amp Introduction & Applications
Voltage Multipliers
Analog Regulators
Switching Regulators
Active Filters

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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.

Course Outcomes:

1. Mastery of Laser and Semiconductor concepts as defined in the course syllabus
2. Knowledge of semiconductor analog integrated circuits and specifications
3. Demonstrate an ability to build, test and troubleshoot electrical circuits and systems
4. Demonstrate an ability to analyze and solve problems relating to laser electrical systems
5. Demonstrate technician level oral and written communication skills
6. Demonstrate an ability to engage in self-directed professional development
7. Demonstrate proper professional and ethical behavior
8. Demonstrate a commitment to quality, timeliness and continuous improvement

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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.

Portfolios Grading Factors: Completeness, Graphics, Quality, 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.