Course Syllabus

Course: **EET K134/5 Electronics I**
Credits: **4**
Prerequisites: **EET* K105/106, MAT* K137**
Corequisites: **MAT* K186**
Instructor: **Dan Courtney – dcourtney@trcc.commnet.edu – 860-215-9417**
Office Hours: **As Posted – Office C134**
Text: **The Science of Electronics – Analog Devices**
David M, Buchla & Thomas Floyd

Course Detail:

CRN	Cred	Title	Day(s)	Time	Date
10312	3	Electronics I	TR	02:00 pm-03:15 pm	01/23-05/20
10313	1	LAB, Electronics I	TR	03:16 pm-04:05 pm	01/23-05/20

Course Description:

This course is an introduction to the internal physical behavior of solid state electronic devices. Conduction in metals and semiconductors is considered. The design, analysis and synthesis of semi-conductor circuits for various applications are presented. Bipolar and field effect transistors as well as integrated circuits are considered. High and low frequency effects are investigated. Various circuits and circuit functions will be addressed, including multistage and feedback amplifiers, operational amplifiers, power amplifiers, oscillators and timers.

The Laboratory section of this course supports Electronics I by providing the student with practical experience in designing, building, and evaluating the operation of a variety of electronic circuits. Both computer simulation and bench experimentation are employed in gaining familiarization with circuit design, function, and operation.

Course Topics:
Course Overview
Semiconductor PN Junctions
Diodes Types & Applications
Transistors Types & Applications
Amplifiers – Characteristics & Classes
Operational Amplifiers
Op Amp applications
Oscillators
Timers

Lab Topics:
Lab Safety & Standard Practices
Equipment Familiarization
Semiconductor Diode Characteristics
Linear Power Supplies
Transistor Driver Circuits – LED/Laser/Motor
Amplifier Gain and Frequency Response
Pulsed Circuit Analysis
Power Amplifier
Op Amp Circuits
Wien Bridge Oscillator
Pulse Width Modulation

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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.

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.

K134/5 Course Outcomes

1. Mastery of Electronics concepts as defined in the course syllabus
2. Knowledge of semiconductor materials, devices and operation
3. Ability to build, test and simulate semiconductor circuits and systems
4. Ability to analyze and solve problems relating to basic semiconductor systems
5. Demonstrate senior level oral and written communication skills
6. Ability to develop professional level laboratory reports
7. Demonstrate an appreciation for lifelong learning
8. Demonstrate proper professional and ethical behavior
9. 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, Professional Attitude. Grading is based on progress toward EET Program, ABET and Course Outcomes.

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.

Use of electronic devices: Use of mobile phones, tablets, laptops and similar devices is limited to direct application to class work. All other usage 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.

Portfolio Grading Factors: Completeness, Organization, 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

Example Portfolio Sections:

Class Notes & Handouts, In Class Assignments, Homework, Lab Reports, Other

Other Required Course Materials:

Flash Drive – all class electronic files should be maintained on a personal flash drive for the duration of the semester
Scientific Calculator e.g. TI-30 – Calculators should be available at all times during classes.