Course Syllabus

Course: EET K105/6 Electric Circuits and Systems
Credits: 4
Prerequisites: High School Algebra or MAT* K095
Corequisites: MAT* K137
Instructor: Elvyn R Rodriguez (email: **Elvyn.Rodriguez@gmail.com**)
Office Hours:
As Posted
Text: Introduction to Electricity, Robert Paynter and Toby Boydell
Course Detail:

CRN	Course #	Credits	Title	Day	Time	Date	Room
10705	EET*K105 T1	3.0	Electric Ckts & Systems	M	5:30 pm-8:15 pm	Jan 23, 2014 - May 20	KTRCC B229
10706	EET*K106 T1A	1.0	LAB, Elec Ckts & Systems	M	8:16 pm-9:55 pm	Jan 23, 2014 - May 20	KTRCC B229

Course Description:

This course provides an introduction to the basic concepts of DC and AC electric circuits. Voltage, current, resistance, energy, and power relationships are introduced. Circuit analysis of basic series and parallel circuits is covered. Instruments and techniques of electrical measurement for both DC and AC circuits are also discussed.

This lab course will supplement the course Electric Circuits & Systems. Students will apply the concepts learned in the classroom and gain practical hands-on experience making electrical measurements using a variety of test instruments.

Course Topics:

- Basic Electrical Concepts
- Circuit Topologies
- Series/Parallel Circuits
- Power and Efficiency
- AC Concepts/Waveforms
- Source equivalent circuits
- Reactance/Frequency Response
- Batteries/Energy Storage
- Magnetic Circuits/Transformers
- Transistors
- Electrical Machines
- Power Systems

Lab Topics:

- Lab Safety & Standard Practices
- Equipment Familiarization – DMM and Power Supplies
- Voltage and Current Dividers
- Volt Ampere Characteristic – Semiconductor Diodes/LEDs
- Graphing using Microsoft Excel
- AC Measurements – Function Generators and Scopes
- Low Pass Filter Frequency Response
- Transistor drivers
- Power Supply Circuits
- Pulse Width Modulation
- DC Motor Operation
- H-Bridge
- Torque/Speed Curves
- Hobby Servos

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

Course Grading: Homework and lab reports will be assigned according to course outline. These are to be turned in on the following week for grading. There will also be 2 tests during the semester and quizzes as notified by instructor. Class and lab grades will be combined so the same final grade will be given for both the class and the lab. Class Participation, Course Portfolio, Laboratory Skills, Professional Attitude are considered as part of the final grade.

Grade Computation:

Competency	Weight
Test #1	10%
Test #2	10%
Quizzes	5%
Course Portfolio*	65%
Class Participation	10%
Total	100%

Scale of Grades

Letter Grade	Numerical Range	Grade Pt. Value
A	93-100	4.00
A-	90-92	3.67
B+	87-89	3.33
B	83-86	3.00
B-	80-82	2.67
C+	77-79	2.33
C	73-76	2.00
C-	70-72	1.67
D	60-69	1.00
F	0-59	0.00

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

Electronic Devices: Use of electronic devices such as laptops, tablets, phones, desktop or other devices for purposes other than class work will have a significant negative impact on grading.

Other Required Course Materials: Scientific Calculator e.g. TI-30 – Calculators should be available at all times during classes.

***Course Portfolio:** The Course Portfolio will be a major component of a student's grade. Students will organize class notes/handouts, in class assignments, homework and laboratory reports into the portfolio.

The portfolio should have easily recognized dividers for individual sections.

Portfolio Grading Factors:

- Completeness
- Organization/Presentation
- Timeliness

Portfolio Grading Frequency

- Mid Term
- Final

Portfolio Sections:

- Class Notes/Handouts
- In Class Assignments
- Lab Reports
- Homework
- Research Topic/Presentation

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ABET Student Outcomes – Associate Degree Programs

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.

K105/6 Course Outcomes

1. Mastery of Electrical Technology concepts as defined in the course syllabus
2. Knowledge of electrical quantities, units and relationships
3. Create engineering graphs using Microsoft Excel
4. Ability to create professional electronic laboratory reports
5. Ability to build and test electrical circuits and systems
6. Ability to analyze and solve problems relating to basic electrical systems
7. Demonstrate technician level oral and written communication skills
8. Ability to engage in self-directed professional development
9. Demonstrate proper professional and ethical behavior
10. Demonstrate a commitment to quality, timeliness and continuous improvement