



Course Syllabus

Course: EET K105/6 Electric Circuits and Systems
Credits: 4
Prerequisites: High School Algebra or MAT* K095
Corequisites: MAT* K137 (Precalculus)
Instructor: Yevhen Rutovytskyy,
Contact information: Yrutovytskyy@threerivers.edu, yrutovyt@gdeb.com
Office Hours: 16:30-17:00 at TRCC tutoring center or by appointment
Text: Introduction to Electricity, Robert Paynter and Toby Boydell
Course Detail:

CRN	Course #	Credits	Title	Day	Time	Date	Room
10705	EET K105	3	Electric Circuits & Systems	M	5 :00-7 :45	1/22-5/20	K229
10706	EET K106	1	Lab, Elec. Circ. & Systems	M	8 :00-9 :25	1/22-5/20	K229

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:

Course Overview
 Electrical Engineering Technology
 Basic Electrical Concepts
 Electrical Components and Systems
 AC Concepts/Waveforms
 Basic Circuit Analysis
 Magnetic Circuits
 Electrical Machines
 Power Systems
 Circuit-modeling Software

Lab Topics:

Lab Safety & Standard Practices
 Equipment Familiarization
 Volt Ampere Characteristic – Semiconductor Diodes
 Voltage and Current Dividers
 AC Measurements – Function Generators and Scopes
 Wheatstone Bridge
 AC/DC Circuit Analysis – Amplifiers
 Pulsed Circuit Analysis
 Power Supply Circuits
 Motors and Generators



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 each week. While lab reports are to be turned in on the following week for grading, the homework will not be graded. Instead each week there will be a short, in-class quiz which will be based on one of the problems from the homework assignment. There will also be 3 tests during the semester (approximately a month apart).

Class and lab grades will be combined so the same final grade will be given for both the class and the lab. Class Participation, Laboratory Skills, Professional Attitude are considered as part of the final grade.

Late assignments will sustain a grade reduction at a rate of 20% per week.

The following grading scheme will be used to determine the final course grade:

$$\text{Class grade} = 0.3 * \text{Quiz grade} + 0.3 * \text{Lab report} + 2 * (0.1 * \text{Exam grade}) + 0.2 * \text{Final exam}$$

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 or TI-83 calculators should be available at all times during classes.



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. Demonstrate an ability to build and test electrical circuits and systems
4. Demonstrate an ability to analyze and solve problems relating to basic 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