Three Rivers Community College
EET K105 - Electric Circuits & Systems
Course Syllabus – Fall 2018

Instructor

Mr. Aaron Dahlen Office C-140 adahlen@trcc.commnet.edu

Course Description

Credit Hours: 3.0 Format: Class Prerequisite: MAT* K095 or MAT* K095I
Corequisites: MAT* K137 or MAT* K137S

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. Other topics include semiconductor devices, transformers and power supplies, microcontrollers, motors and drive circuits, and electrical power generation / distribution. The lab portion of this 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.

Class Time

CRN 31839 / 32971:	Monday	05:00 PM - 06:40 PM / 06:41 PM - 09:26 PM in B209
CRN 30540 / 32972:	Wednesday	05:00 PM - 06:40 PM / 06:41 PM - 09:26 PM in B209

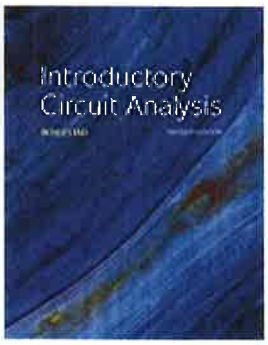
Office Hours

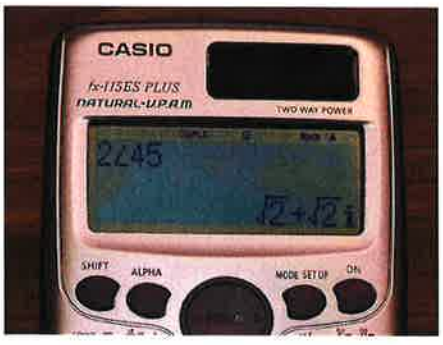
Scheduled hours posted on Blackboard, and office door; also available by appointment.

Required Materials

Textbook: "Introductory Circuit Analysis (13th Edition)" by Robert Boylestad
ISBN-13: 978-0133923605

Calculator: An engineering / scientific calculator is required. The quizzes and exams are written assuming the student's calculator can quickly solve simultaneous equations, and convert trig forms between polar and rectangular. The **Casio fx-115ES Plus** is recommended for this course. Calculators such as the Texas Instruments TI-89 Titanium may be used, but the cost is not justified. Cell phones are not allowed.





University Policy

Academic integrity policy / statement: Academic integrity is essential to a useful education. Failure to act with academic integrity severely limits a person's ability to succeed in the classroom and beyond. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. In this class and in the course of your academic career, present only your own best work; clearly documenting the sources of the material you use from others; and act at all time with honor.

Student disabilities policy / statement: Three Rivers Community College (TRCC) is committed to the goal of achieving equal educational opportunity and full participation for individuals with disabilities. To this end, TRCC seeks to ensure that no qualified person is excluded from participation in, is denied the benefit of, or otherwise is subjected to discrimination in any of its programs, services, or activities. Achieving full participation and integration of persons with disabilities requires the full cooperation and effort of all TRCC faculty and staff. The college will strive to maintain excellence in its services and to deliver those services equitably and effectively.

Student: Students must complete and submit the form for self-disclosure of a disability to the college Advising and Counseling Center (Room A113) . Students should also contact and meet with a college disability service provider and provide adequate documentation of disability to their disability service provider as soon as possible after admission.

Instructor: As needed, the college disability service provider will interact with faculty to help ensure reasonable and appropriate adjustments for a student with a documented disability. The college disability service provider will complete a memo to faculty and a form detailing appropriate adjustments for the student. Generally, the student will carry this information to instructors and discuss it with them. Whenever possible, the student and faculty member will collaborate on the implementation of the student's adjustments.

The college's two disability service providers are:

Elizabeth Willcox, Advisor
(860) 215-9289, ewillcox@trcc.commnet.edu

Matt Liscum, Counselor
(860)215-9265, mliscum@trcc.commnet.edu

Non-discrimination policy / statement: Three Rivers Community College does not discriminate on the basis of race, color, religious creed, age, sex, national origin, marital status, ancestry, present or past history of mental disorder, learning disability or physical disability, sexual orientation, gender identity and expression, or genetic information in its program and activities. In addition, the College does not discriminate in employment on the basis of veteran status or criminal records. The following person has been designated to handle inquires regarding the non-discrimination policies:

Ken Saad, Equity and Diversity Officer,
(860) 215-9319, KSaad@trcc.commnet.edu

Sexual misconduct policy / statement: Three Rivers Community College strongly encourages all students to report any incidents of sexual misconduct, which includes, but is not limited to, sexual harassment, intimate partner violence, and sexual assault. Students have the right to the prompt and fair resolution of all claims, and the College will preserve the confidentiality of all who report to the fullest extent possible and allowed by law. College employees will explain the limits of confidentiality before information about the incident is revealed. To report sexual misconduct, or to learn more about your options, please contact the Title IX Coordinator. **If you need immediate, confidential assistance, please call the Sexual Assault Crisis Center of Eastern Connecticut (SACCEC) hotline at 860-456-2789**

SACCEC
78 Howard Street, 2nd floor
New London, CT 06320
(860) 442-0604
http://www.saccec.org/

Maria Krug
Title IX Coordinator
Three Rivers Community College
574 New London Turnpike, Norwich, CT 06360
(860) 215-9208; mkrug@trcc.commnet.edu.

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.

EET K105 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.

Class Policy

Course Web Page: Course material will be posted to Blackboard. The site includes links to a complete syllabus, course schedule, and select homework / quiz / exam solutions. All course announcements including changes to the schedule and modifications to assignments will be made via email announcements.

Schedule: The class schedule, and homework assignments are posted to Blackboard. This will be adjusted as necessary to account for snow days or other unexpected events.

Participation: Every class include a "Peer Time" activity where students work together to solve exercises reinforcing the day's lecture.

Collaboration: Students shall not collaborate on quizzes or exams. Collaboration on homework is allowed and highly encouraged. However, submitted solutions must be independent work.

Homework: Daily homework will be assigned and collected. All homework assignments are due at the beginning of class on the scheduled date. Late homework will be accepted up with a 50% grade penalty. Solutions will be posted to Blackboard. There will be times when the instructor is pressed for time and is unable to carefully grade all homework. Rather than delay grading, only portions of the homework or random student's work will be graded. Items that are not graded are assumed to be correct. Students are encouraged to follow up by comparing their work to the Blackboard posted solutions

Homework Kicker: "Spaced learning" is a challenge for a class that meets once a week. To facilitate this learning technique, homework is divided into an alpha and bravo set. Students are encouraged to complete the alpha homework set early in the week and then wait a few days before completing the bravo set. This gives the mind time to process the information thereby improving retention. The homework kicker is a bonus given to students that show (email, Blackboard, pictures, etc.) that they have completed the homework on two separate days as opposed to doing it all in one setting.

Quizzes: There will be at about 10 quizzes this semester (see Blackboard posted schedule). Students, who, in the opinion of the instructor, have a valid excuse will be allowed to take the quiz (including unscheduled) during the instructor's office hours. Others may take the quiz but will have their quiz score multiplied by 0.8. The opportunity to take a quiz ends one week after the quiz is given unless there are extenuating circumstances or other arrangements have been made with the instructor. This allows the instructor to post solutions to Blackboard in a timely manner. Students are allowed to use a single 3 x 5 note card for the quiz. When complete, this card is to be stapled to the quiz. There will be some quizzes where calculators are NOT allowed.

Exams: There will be three in-class examinations (see Blackboard posted schedule). Make up exams are allowed. Student, who in the opinion of the instructor, have a valid excuse will be allowed to take the exam during the instructors office hours. Others may take the exam but will have the exam score multiplied by 0.8. The opportunity to make up an exam ends one week after the exam was given unless there are extenuating circumstances or other arrangements have been made with the instructor. This allows the instructor to post solutions to Blackboard in a timely manner. Students will be allowed to use a single 3 x 5 note card (both sides) and a calculator for all exams. All note cards must be turned in with the exam.

Labs: All labs must be completed to pass this course. Students are responsible for contacting the instructor to make arrangement for a make up lab. At least four of the labs will require a formal written report. Students will be given a rubric for each formal lab report.

Assignments and Grading: All problems for quizzes and exams will be graded approximately as described in this rubric:

Percentage	Reflection of content/correctness
100 %	Solution is correct and supporting work is included. Work is clear and concise. When required a clear and concise explanation is given. Drawing and figures are included and properly labeled when required.
80 %	Solution is almost correct but includes a minor computation error copy error, or error in notation. Work is clear and concise. When required clear and concise explanations are given. Drawing and figures are included and properly labeled when required.
60 %	Solution is partially correct but is missing a critical element in the chain of reasoning. When required an explanations is given but may contain flaws in the chain of reasoning. Drawing and figures are included when required but lack a critical element.
40 %	Some understanding of the chain of reasoning is present but the solution incomplete. When required an explanations is given but may contain flaws in the chain of reasoning. Drawing and Figures are not present when required
20 %	Understanding of the chain of reasoning is not demonstrated.
0 %	Work is missing or meaningless.

Extra Credit: Extra credit may be given on rare occasions. All such opportunities will be made available to all students and announced in class or email.

Grade Weight: The class grade is calculated using the following weighting scale:

Item	Weight
Exams	50%
Quizzes	15%
Homework	10%
Homework kicker	5%
Formal labs	15%
Peer time participation	10%

The overall grade conversion is:

A+	95% - 100%	A	93% - 94%	A-	90% - 92%
B+	87% - 89%	B	83% - 86%	B-	80% - 82%
C+	77% - 79%	C	73% - 76%	C-	70% - 72%
D+	67% - 69%	D	63% - 66%	D-	60% - 62%
F	0 - 59%				

The class policies and procedures outlined in this document may be changed due to extenuating circumstances or as agreed upon by instructor and students.

Rev: 30 Aug 18	Session T2 of EET K105 – Fall 2018		
Class #	**Date**	**Quiz / Exam**	**Section Name and Assigned Homework**
1	Wed, August 29		3.6, 3.8: Resistor color code / Ohmmeters 4.2, 4.3: Introduction to Ohm's Law 5.2, 5.3, 5.13: Introduction to series circuits / Breadboards 6.2, 6.3 Introduction to parallel circuits **Homework A:** 3.35(A, C), 4.1, 4.3, 4.15, 5.3(A, B), 6.4(A, B) **Homework B:** 3.37, 4.5, 4.9, 5.7, 5.9, 6.10
2	Wed, September 5	Quiz #1 (Take Home)	2.10: Ammeters and Voltmeters 5.2, 5.3: Series circuits 6.2, 6.3: Parallel circuits 7.10: Ammeter and voltmeter design 5.6, 6.5: Introduction to KVL and KCL **Homework A:** 3.35(B, D), 4.7, 5.11, 6.4(C), 6.7(A, C), 6.13, 7.39 **Homework B:** 3.34(A, C), 4.11, 5.3(C), 5.6, 6.6, 6.7(B) 6.12
3	Wed, September 12	Quiz #2	2.5, 2.6: The battery 5.6, 6.5: KVL and KCL 5.7, 5.8: Voltage division 6.6: Current division 6.7: Voltage sources in parallel **Homework A:** 2.27, 2.41, 5.5, 5.12, 5.25, 5.27(A), 5.29, 6.8, 6.15, 6.33, 6.37(A), 7.41 **Homework B:** 2.26, 5.4, 5.13, 5.15, 5.24, 5.26(A), 5.28, 6.10, 6.34, 6.37(B), 7.45(A)
4	Wed, September 19	Exam #1	2.3, 2.4: Voltage and current 3.5: Types of resistors 4.4, 4.5, 4.6: Power / Energy / Efficiency 5.4, 6.4: Power in series / parallel circuits 7.11: The car battery **Homework A:** 3.31, 4.21, 4.31, 4.36, 4.39, 4.51, 5.17, 5.27(B), 5.31(A), 6.35(A), 6.38 **Homework B:** 3.32, 4.23, 4.32, 4.41, 4.50, 5.26(B), 5.31(B), 6.25, 6.35(B), 6.39

Class #	Date	Quiz / Exam	Section Name and Assigned Homework
5	Wed, September 26	Quiz #3	5.6, 6.5: KVL and KCL (review) 7.2 to 7.8: Series / parallel circuits 8.2: Current Sources 8.3, 8.5, 8.6: Introduction to nodal and mesh analysis B: Simultaneous equations **Homework A:** Handout (calculator simultaneous equations) 4.29, 4.40, 4.47, 4.53, 5.18, 5.30, 5.35, 7.3, 7.7, 7.17, 8.1, 8.7(A) **Homework B:** Handout (calculator simultaneous equations) 4.33, 4.48, 4.56, 5.37, 5.41, 6.22, 7.4, 7.11, 7.20, 8.7(B), 8.16
6	Wed, October 3	Quiz #4	8.3, 8.5, 8.6: Nodal and mesh analysis (part 1 of 2) **Homework A:** 7.5, 7.8, 7.29, 7.32, 7.35, 8.9, 8.21, 8.41 **Homework B:** 7.6, 7.12, 7.27, 7.34, 8.3, 8.13, 8.16, 8.23, 8.43
7	Wed, October 10	Quiz #5	8.3, 8.5, 8.6: Nodal and mesh analysis (part 2 of 2) 9.3, 9.4: Introduction to Thévenin's theorem / Norton's Theorem **Homework A:** 8.25, 8.29, 8.26, 8.31, 8.42, 9.9, 9.23 **Homework B:** 8.19, 8.27, 8.30, 8.46, 9.11, 9.25
8	Wed, October 17	Exam #2	9.2: Superposition Theorem 9.3, 9.4: Thévenin's theorem / Norton's Theorem **Homework A:** 8.44, 8.50, 9.3, 9.11, 9.13, 9.16, 9.27 **Homework B:** 8.45, 8.51, 9.5, 9.19, 9.20, 9.28

Class #	Date	Quiz / Exam	Section Name and Assigned Homework
9	Wed, October 24	Quiz #6	9.5: Maximum power transfer theorem 9.6: Millman's Theorem Introduction to Oscilloscope and function generator Introduction to microcontroller Exponential functions 10.4: Introduction to capacitors 10.11: Capacitors in series and in parallel **Homework A:** Handout 9.6, 9.31, 9.39, 10.3, 10.51 **Homework B:** Handout 9.8, 9.33, 9.41, 10.4, 10.53
10	Wed, October 31	Quiz #7	10.3: Capacitance 10.5, 10.6, 10.7, 10.8: Transients in capacitive networks 10.10: The Current IC **Homework A:** 9.35, 9.42, 10.7, 10.19, 10.25, 10.29, 10.37, 10.49 **Homework B:** 9.37, 9.43, 10.21, 10.27, 10.35, 10.39, 10.48, 10.52
11	Wed, November 7	Quiz #8	11.2: Magnetic field 11.3: Inductance Semiconductor diode 4.4, 4.5, 4.6: Review of Power / Energy / Efficiency 10.12: Energy stored in a capacitor 11.10: Average Inducted Voltage 11.13: Energy stored in an inductor **Homework A:** Handout 10.26, 10.39, 10.40, 10.47, 10.57, 11.2, 11.3, 11.7 **Homework B:** Handout 10.23, 10.41, 10.50, 10.60, 11.5

12	Wed, November 14	Quiz #9	4.2, 4.3: Review Ohm's Law Hopkinson's Law 12.2 to 12.12: Magnetic circuits 11.4: Induced Voltage 11.5, 11.6, 11.7, 10.8: Transients in inductive networks 11.11: Inductors in Series and Parallel **Homework A:** 11.7, 11.15, 11.21, 11.31, 11.35, 12.3, 12.5, 12.9, 12.19 **Homework B:** 11.11, 11.16, 11.20, 11.33, 11.39, 12.4, 12.6, 12.10, 12.20
13	Wed, November 21	TBD	
14	Wed, November 28	Exam #3	13.4: The sinusoidal waveform 13.6: Phase Relations 13.8: Effective (RMS) Value 14.11: Phasors 12.3: Iron-core transformer Electrical power generation and distribution **Homework A:** Handout 13.12(A, C), 13.15(A, C), 13.29, 13.35, 13.49, 14.53, 23.5 **Homework B:** Handout 13.12(B, D), 13.15(B, D), 13.31, 13.37, 13.51, 14.54, 23.4
15	Wed, December 5	Quiz #10	AC motors and drives Arc blast
16	Wed, December 12		Future studies at TRCC Wrapping up the course