

(Schedule Modified 10-11-12. **Changes highlighted.**)

Official TCC Course Syllabus

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| Discipline Prefix: EGR | Course Number: 260 | Course Title: Circuit Analysis | |
| | Course Section: D01C | | |
| Credit Hours: 3 | Lecture Hours: 3 | Clinical Hours: | Lab Hours: 0 |
| Contact Hours: 3 | Studio Hours: | Semester: Fall 2012 | |
| Meeting Days/Time/Location: Tuesdays & Thursdays, 12:00 – 1:15pm, Room UTC2-0409, Chesapeake Campus | | | |

Instructor Information

Name: Paul Gordy

Office Location: H-115, Advanced Technology Center, Virginia Beach Campus

Office Hours: Tuesdays and Thursdays: 11:00 – 12:00 (Location on Chesapeake Campus TBD).

Email: PGordy@tcc.edu Phone: 822-7175

Course Website: www.faculty.tcc.edu/PGordy

Blackboard site: <http://learn.vccs.edu>

Course Information

Course Description

EGR 260 is a study of linear circuit analysis, including the study of basic electrical properties, resistive circuits, network equations, network reduction techniques, network theorems, operational amplifiers, two-port parameters, inductors, capacitors, and first-order and second-order circuits. A significant use of the PSPICE circuit analysis program is included.

Prerequisites and/or Co-requisites

Pre-requisites: MTH 174, EGR 120

Co-requisite: MTH 279

Required Course Texts and Supplementary Materials

1. Lecture Notes/PowerPoint Presentations - This is the primary source of information for this course. Material covered in lecture may not be found in the textbook. Students should print the PowerPoint presentations prior to class and use them to take notes as the presentations leave space for problems solved in class. If any lectures are missed, the student should try to copy the notes from another student.
2. Main Textbook - The primary textbook required for this course is ***Electric Circuits, 9th Edition***, by Nilsson (ISBN: 0132804999). This textbook is also used in EGR 261. This textbook includes a PSPICE supplement and an access code for Mastering Engineering (online homework system) and will also be used for EGR 261 and EGR 270.
3. PSPICE Textbook - An additional text is recommended that will serve as a reference for PSPICE programming assignments made in EGR 260, 261, and 270. The text is ***Schematic Capture with Cadence PSPICE, 2nd Edition***, by Marc Herniter (ISBN: 9780130484000).

4. Calculator – It is recommended that each student have one of the following calculators: TI-89 or TI-nspire CX CAS (be sure that it is the CAS model). These calculators have many advanced features that are especially useful in the electrical engineering courses. If you choose not to buy one of these calculators, you may be at a disadvantage to other students on a test.

Course Learning Outcomes

- State and apply basic electrical laws, components, definitions, and units
- Manipulate and solve systems of equations using matrices
- Apply various network reduction techniques to simplify and/or analyze circuits
- Apply various network theorems to the analysis of resistive circuits.
- Analyze resistive networks using simultaneous network equations.
- Analyze operational amplifier circuits.
- Determine two-port model representation for resistive electrical networks and to use two-port models in further network analysis.
- Define and apply basic terms and relationships involving inductance and capacitance.
- Analyze linear circuits containing operational amplifiers
- Analyze first-order and second-order circuits to determine the complete circuit response.
- Use PSPICE to analyze various types of electric circuits

Topics Covered in the Course

Course Content:

- I. COURSE INTRODUCTION
 - A. Course Overview
 - B. Curriculum Overview/Transfer Information
- II. INTRODUCTION TO CIRCUIT ANALYSIS
 - A. Systems of Units and Basic Quantities
 - B. Component Definitions
 - C. Connection Laws – KVL and KCL
 - D. Circuit Analysis
- III. NETWORK REDUCTION TECHNIQUES
 - A. Series and Parallel Resistance
 - B. Voltage and Current Division
 - C. Source Transformations
 - D. Linearity and Superposition
- IV. FORMULATION AND SOLUTION OF CIRCUIT EQUATIONS
 - A. Solution of Simultaneous Linear Equations
 - B. Node Voltage Equations
 - C. Mesh Current Equations
- V. CIRCUIT MODELS
 - A. One-Port Models: Thevenin's and Norton's Theorems
 - B. Two-Port Models: Two-Port Parameters
 - C. Model Applications
- VI. SIGNAL MODELS
 - A. Unit Step Function
 - B. Unit Impulse Function
 - C. Piecewise Continuous Functions
- VIII. ANALYSIS OF DYNAMIC CIRCUITS
 - A. Inductors and Capacitors
 - B. Solution of LTI Ordinary Differential Equations
 - C. Analysis of First and Second Order Circuits

Description of Assignments/Assessments

Homework Assignments – All homework assignments in this course must be done through Mastering Engineering (www.masteringengineering.com). You must purchase a textbook that includes an online access code for Mastering Engineering or else you can purchase an online access code separately. No homework will be accepted other than through Mastering Engineering.

Mastering Engineering Course Number for Fall 2012: MEGORDY260

Grade Policy

Course grades will be computed based on the following percentages:

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| Tests (4) | 60% |
| Homework Assignments using Mastering Engineering | 12% |
| PSPICE Assignments (3) | 8% |
| Final Exam (comprehensive) | 20% |

Grades will be based on the following scale:

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| A: 90 – 100 |
| B: 80 – 89 |
| C: 70 – 79 |
| D: 60 - 69 |
| F: 0 – 59 |

Final grades are made available to each student within the Student Information System (SIS) now web delivered via MyTCC or SIS.

Based on the progression of the course, the grade distribution for each assignment may change. However, if changes are made, I will notify students in a timely manner and in writing.

Course Schedule

The following course schedule may change due to the progression of the course. The course schedule may change at the discretion of the instructor; however, students will be notified in writing when any changes/additions are made to the schedule.

Tentative Course Outline/Schedule

| Date | Topic(s) | Text and PowerPoint | Homework (Mastering Engineering) - due by midnight on this date |
|---------|---|------------------------|---|
| R, 8-23 | Introduction. Mastering Engineering. Circuit variables and definitions. Charge and current. | Ch 1 | |
| T, 8-28 | Voltage, power, and energy. Independent voltage and current sources. | Ch 1-2 | HW #0 -Intro to Mastering Engineering due |
| R, 8-30 | Resistance, KVL, KCL, series and parallel elements | Ch 2 | HW #1 (Ch 1) due |
| T, 9-4 | Combining independent sources. Analyzing circuits using KVL and KCL. | Ch 2 | |
| R, 9-6 | Dependent sources. Series and parallel resistance. Voltage division. | Ch 2/3 | |
| T, 9-11 | Current division, analyzing resistive circuits. | Ch 3 | |
| R, 9-13 | Bridge Circuits. Delta-Wye and Wye-Delta transformations. | Ch 3 | HW #2 (Ch 2) due |
| T, 9-18 | Node Equations | Ch 4.1-4.8 | HW #3 (Ch 3) due |
| R, 9-20 | Test #1 (Chapters 1-3) | | |
| T, 9-25 | PSPICE Demonstration (full class) – PSPICE Assignment #1 assigned | Introduction to PSPICE | |

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| R, 9-27 | Node Equations/Mesh Equations | Ch 4.1-4.8 | |
| T, 10-2 | Mesh Equations | Ch 4.1-4.8 | HW #4 (Ch 4.1-4.4) due |
| R, 10-4 | Operational Amplifiers | Ch 5 | HW #5 (Ch 4.5-4.6) due |
| T, 10-9 | Operational Amplifiers | Ch 5 | |
| R, 10-11 | Source Transformations | Ch 4.9-4.16 | PSPICE Assignment #1 due |
| T, 10-16 | Superposition, Thevenin's and Norton's theorems | Ch 4.9-4.16 | HW #6 (Ch. 5) due |
| R, 10-18 | Test #2 (Chapter 4.1-4.8 and Chapter 5) | | |
| T, 10-23 | Thevenin's and Norton's theorems, Maximum Power Transfer Theorem | Ch 4.9-4.16 | |
| R, 10-25 | Maximum Power Transfer Theorem PSPICE Demonstration (half class) – PSPICE Assignment #2 assigned | Ch 4.9-4.16 | |
| T, 10-30 | Capacitors | Ch 6 | HW #7 (Ch. 4.9-4.16) due |
| R, 11-1 | Capacitor and Inductors. | Ch 6 | |
| T, 11-6 | Inductors. | Ch 6 | HW #8 (Ch. 6, sections 2&3 on capacitors) due |
| R, 11-8 | First order circuits | Ch 7 | HW #9 (Ch. 6, sections 1&3 on inductors) due |
| T, 11-13 | Test #3 (Chapter 4.9-4.16 and Chapter 6) | | |
| R, 11-15 | First order circuits. | Ch 7 | PSPICE Assignment #2 due |
| T, 11-20 | Unit step functions. Unit step response. | | |
| R, 11-22 | Thanksgiving. TCC closed. | Ch 7 | |
| T, 11-27 | Second order circuits. PSPICE #3 assigned. | Ch 8 | HW #10 (Ch. 7) due |
| R, 11-29 | Second order circuits | Ch 8 | |
| T, 12-4 | Second order circuits. Test #4 (take-home test) passed out. Due in one week. | Ch 8 | |
| R, 12-6 | Make-up class or review | | HW #11 (Ch. 8) due PSPICE Assignment #3 due |
| T, 12-11 | Final Exam (12:00 – 2:00) – Instructor might make other arrangements if necessary | | Test #4 due |

Blackboard and Course Communication

Students should check Blackboard and their VCCS student email accounts regularly at least every 72 hours. The best way to reach the instructor is by email. The instructor will respond within 72 hours, although generally much sooner.

Course Policies

- Attendance Policy:** All students are expected to be present and on time at all scheduled class and laboratory meetings. Instructors are not required to admit a student who arrives late to the classroom. A student who adds a class or registers after the first day of classes is counted absent from all class meetings missed.

If a student is absent more than 15 percent of scheduled instructional time, attendance may be defined as unsatisfactory. This calculation includes absences occurring during the add/drop period. See also the Withdrawal Policy in this syllabus for more information. Per the college's attendance policy, faculty has the right to develop a more stringent policy as well. Students who do not attend or participate in class by the deadline to drop for tuition refund may be deleted from the course.

2. Late Work/Make-up Exam Policy:

- No late assignments will be accepted through Mastering Engineering.
- PSPICE assignments will be accepted late with a 10-point penalty, but no late PSPICE assignments will be accepted after the final exam.
- No make-up tests are allowed. Missing a test will result in a grade of 0 for the test unless the student gets approval before the tests or notifies the instructor within 24 hours of the test in case of emergency.
- Students will not receive credit for group assignments if they were absent when the group assignment was performed.

3. Statement on Classroom Behavior: TCC is committed to maintaining a social and physical environment conducive to carrying out its education mission. Therefore, all members of the TCC community are expected to demonstrate standards for civility.

- Be moderate in speaking. Loud, obscene, argumentative, or threatening speech is disruptive to teaching and learning and is offensive to others. It has no place in an academic setting.
- Resolve any disagreements in a positive, non-combative manner. Request the assistance of college authorities if needed.
- Show respect for the comfort of others in an educational setting by observing acceptable standards for personal cleanliness and dress.

4. Electronic Devices Policy: Cell phones, pagers, and other communication devices are prohibited from use in classrooms, laboratories, and libraries, unless authorized by the appropriate faculty or staff. Although soundless communication devices such as cell phones and pagers are permissible in classrooms, college offices, and/or meeting rooms, they must not be answered during class.]

5. Disposition of Classes for Emergency Shutdown of the College:

In the event of an emergency shutdown of the college, the president and her executive staff may elect to conclude the term in session if eighty-five percent or more of that term has been completed. If the term in session is concluded, faculty shall compute final grades of students based on coursework completed at that point.

Academic Policies

Students are responsible for being aware of the policies, procedures, and student responsibilities contained within the current edition of the TCC *Catalog* and *Student Handbook*. Students should familiarize themselves with the college's policies regarding misconduct and inclement weather found in the *Student Handbook*.

Withdrawal Policy

Students who wish to withdraw without academic penalty should contact a counselor to determine the appropriate procedure. Withdrawals through completion of 60 percent of a session will result in a **W** grade. After 60 percent of a session is completed, a withdrawal will result in a grade of **F** in a credit course or a grade of **U** in a developmental course, except under mitigating circumstances that must be documented by the instructor and approved by the academic dean. Dynamic session classes have unique refund and withdrawal dates. Contact a campus Enrollment Services Office for more information, or visit <http://www.tcc.edu/students/calendar/academic/Dynamic.htm>.

A student who drops after the last day to withdraw does not receive a "W." He/she receives an "F," in which case there is both an academic and financial penalty. A student who withdraws by the deadline faces a financial penalty, but not an academic penalty.

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| 9-10-12 | Deadline to drop for tuition refund |
| 11-1-12 | Deadline to withdraw without academic penalty and to receive a grade of W for the course |

Academic Integrity

TCC will expect students to demonstrate personal and academic integrity, to be open to new ideas, and to share in a community where individuals from diverse backgrounds and cultures help one another grow intellectually, socially, and personally.

TCC expects students to achieve, not just to get by. And while many caring and talented faculty and staff are here to help, students must take responsibility for their own learning. Students should strive for a high level of academic performance and to be responsible, contributing citizens within the college and in outside communities. Above all, TCC wants students to develop a love of learning that will last a lifetime, along with a life-long interest in maintaining emotional and physical wellness.

Statement on Plagiarism and Academic Misconduct

Academic misconduct includes, but is not limited to, the following actions: cheating on an examination or quiz—either giving or receiving information; copying information from another person for graded assignments; using unauthorized materials during tests; collaboration during examinations; buying, selling or stealing examinations; arranging a substitute for oneself during examinations; substituting for another person, or arranging such a substitution; plagiarism—the intentional or accidental presentation of another’s words or ideas; collusion with another person or persons in submitting work for credit in class or lab, unless such collaboration is approved in advance by the instructor.

Faculty members who have reliable evidence of academic misconduct will (1) investigate the matter, and (2) review the facts of the matter and the proposed penalty with the appropriate academic dean. They may then take one or more of the following actions:

- Require the work to be accomplished again
- Give no credit for the test, paper, or exercise
- Assign a grade of **F**, **U**, or **W** for the course
- Refer the matter to the campus Dean for Student Services or designee for possible disciplinary sanction through the college’s disciplinary procedure

If the faculty member chooses to refer the matter to the campus Dean for Student Services or designee for disposition, the Plenary Disciplinary Procedure shall be followed, and the student’s dismissal from the college is a possibility.

Disability Services

Students who have documented, diagnosed disabilities, and who need special accommodations for tests, etc., are advised to see the Disabilities Services staff in Student Services so that the instructor may be notified of what accommodations are appropriate in each case. Requests for accommodations should be made to the designated campus disability services counselor at least 45 days before classes begin. Documentation must be provided to support the need for accommodations.

For assistance with disabilities, contact the campus Disabilities Counselor/Provider or the Coordinator of Learning Disabilities Services: call 822-1213, visit Student Services/Development, or visit the Disability Services webpage at <http://www.tcc.edu/students/specialized/disabilityservices/index.htm>

Emergency Procedures

In the event of a bomb threat, tornado, or fire, students and staff may be asked to evacuate the building or move to a secure location within the building. Evacuation routes for movement to an external location or to a shelter within the building are posted at the front of the room. Students should review the maps and make sure that the exit route and assembly location for the building are clearly understood. If assistance is required during an evacuation, please let the instructor know at the end of the first class.

Tidewater Community College uses TCC Alerts to immediately contact and inform faculty, staff and students of a major crisis or emergency. TCC Alerts delivers important emergency alerts, notifications, and updates via:

- Email account (work, home, other)
- Cell phone
- Pager
- Smartphone/PDA (BlackBerry, Treo & other handhelds)

When an incident or emergency occurs, authorized senders will be instantly notified via TCC Alerts. TCC Alerts is a personal connection to real-time updates, instructions on where to go, what to do, or what not to do, who to contact, and other important information. New users may also register by sending a text message to **411911** keyword: **TIDEWATER**.

Student Success Resources

The following resources are available to TCC students. See the *Student Handbook* or visit <http://www.tcc.edu/forms/handbook/> for more information about student services and locations.

Learning Resource Centers

Each campus houses a library and media resources in a Learning Resources Center (LRC). A separate slide and print library is located at the Visual Arts Center. The Learning Resources Centers contain research materials in both print and electronic format to support the courses, curricula, and mission of the college. Library materials include books, newspapers, magazines, journals and an extensive collection of indexes, abstracts and full text databases. Media resources include videotapes, audiotapes, films, CD-ROM/DVD, computer files, and other audiovisual materials. Visit this site for more information: www.tcc.edu/lrc/

Academic Support Services

Each campus provides various kinds of academic assistance. One-on-one tutoring, math and computer labs, and other forms of individual and group assistance may be available. Students can also find free help for writing, from short questions about commas and comma splices to a comprehensive review of research papers in progress, in the Writing Centers.

Online Help Desk

Visit the following Distance Learning Resources for Students website for information about computer skills, technical support, library services for online students, and much more: <http://www.tcc.edu/students/dtls/>

Important Websites

- College Website: www.tcc.edu
 - Blackboard and Student E-mail: <https://tcc.my.vccs.edu/jsp/home.jsp>
 - Student Handbook: <http://www.tcc.edu/forms/handbook/>
 - TCC Catalog: <http://www.tcc.edu/forms/catalog/>
 - Class Schedule: <http://www.tcc.edu/schedule/> (or log-in to SIS for current course offerings)
 - Academic Calendar: <http://www.tcc.edu/students/calendar/academic/index.htm>
 - Distance Learning Resources: <http://www.tcc.edu/students/dtls/>
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