

## Official TCC Course Syllabus

Discipline Prefix: EGR	Course Number: 261	Course Title: Signals & Systems	
	Course Section: D01B		
Credit Hours: 3	Lecture Hours: 3	Clinical Hours:	Lab Hours: 0
Contact Hours: 3	Studio Hours:	Semester: Fall 2013	
Meeting Days/Time/Location: Mondays & Wednesdays, 9:30 – 10:45pm, Room H164, Advanced Technology Center, Virginia Beach Campus			

### Instructor Information

Name: Paul Gordy

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

Office Hours: As posted on office door and on course Blackboard site

Email: [PGordy@tcc.edu](mailto:PGordy@tcc.edu) Phone: 822-7175

Course Website: [www.faculty.tcc.edu/PGordy](http://www.faculty.tcc.edu/PGordy)

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

## Course Information

### Course Description

EGR 261 covers topics including Laplace transforms and Laplace transform analysis of circuits, time and frequency domain representation of linear systems, methods of linear system analysis including convolution and Laplace transforms, frequency domain representation of signals including frequency response, filters, Fourier series, and Fourier transforms.

### Prerequisites and/or Co-requisites

**Pre-requisites:** EGR 260, MTH 279

**Co-requisite:** none

### 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. Textbook - The first main textbook required for this course is **Electric Circuits, 9<sup>th</sup> Edition**, by Nilsson (ISBN: 0132804999). Note that Mastering Engineering is not used in this course, so avoid purchasing a textbook that includes an access code for Mastering Engineering.
3. Textbook - The second main textbook required for this course is **Linear Signals and Systems, 2nd Edition**, by Lathi, Oxford University Press, 2005 (ISBN: 9780195158335).
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

- Determine Laplace and inverse Laplace transforms of a wide variety of functions
- Solve differential equations using Laplace transforms
- Perform frequency domain analysis of circuits using Laplace transforms
- Classify various types of signals and systems
- Determine the impulse response and convolution of signals
- Determine transfer functions and frequency response for various types of circuits
- Determine Fourier series representations, line spectra, and power distribution of periodic power signals
- Determine Fourier transforms, spectral density, and energy distribution of energy signals
- Analyze and characterize two port filters
- Use PSPICE to analyze various types of electric circuits

## Topics Covered in the Course

See the Tentative Course Outline/Schedule shown on the following page.

## Description of Assignments/Assessments

### Homework Assignments:

Regular reading and problem assignments will be made, usually on a weekly basis. The problems may be collected on the assigned due date for grading. Check the **Due Dates Table** on the course Blackboard site to see when each assignment is due. Problem solutions will be given to the student when the homework is collected. No late homework assignments will be accepted. The lowest homework grade of those collected will be dropped.

Homework Format - Each assigned homework problem must be neatly presented and contain the complete problem statement as well as any associated circuits, diagrams, etc. A minimum 10% penalty may be given if these conditions are not met.

### Computer Assignments:

Computer assignments will be made using PSPICE, a circuit analysis and simulation program produced by Cadence, as well as using MATLAB, MathCAD, or Excel. Examples and demonstrations will be provided with all computer assignments. Computer assignments may be accepted late with a 10% penalty.

## Grade Policy

Course grades will be computed based on the following percentages:

4 Tests (15 % each)	60 %
Final Exam (comprehensive)	20 %
Homework Assignments	10 %
Computer Assignments	10 %

Grades will be based on the following scale:

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

Topics	Textbook Sections
I. Introduction to Laplace Transforms A. Applications in Electrical & Computer Engineering B. Definition and Basic Transform Pairs C. Transform Properties D. Inverse Transforms – Partial Fraction Expansion E. Solution of Differential Equations	Nilsson: Chapter 12, Sections 1-9 Lathi: Chapter 4, Sections 1-3 Lathi: Sections B.5
II. Laplace Transform Analysis of Circuits A. Laplace Transform Solution of Circuit Equations B. The Laplace Transformed Circuit C. Network Reduction Techniques D. Formulation of Circuit Equations	Nilsson: Chapter 13, Sections 1-5,7 Lathi: Chapter 4, Section 4
<b>Test #1</b>	
III. Introduction to Signals and Systems A. Overview and Motivation B. Classification of Systems C. Classification of Signals	Lathi: Chapter 1, Sections 1-4, 6-8
IV. Representation and Analysis of LLTI Systems A. Differential Equations B. Time Domain Techniques 1. Impulse Response Function 2. Convolution  <b>Test #2</b>  C. Frequency Domain Techniques 1. Transfer Function 2. Frequency Response	Nilsson: Chapter 13, Section 6 Nilsson: Appendices D & E Lathi: Chapter 2, Sections 1-8
<b>Test #3</b>	
V. Frequency Domain Representation of Signals A. Periodic Power Signals 1. Fourier Series 2. Line Spectrum and Power Distribution B. Energy Signals 1. Fourier Transforms 2. Spectral Density and Energy Distribution	Nilsson: Chapter 16, Sections 1-9 Nilsson: Chapter 17, Sections 1-8 Lathi: Chapter 6, Sections 1-5 Lathi: Chapter 7, Sections 1-4, 6
<b>Test #4</b>	
VI. Applications A. Filters B. Signal Sampling C. Signal Multiplexing	Nilsson: Chapter 14, Sections 1-4 Nilsson: Chapter 15, Sections 1-2 Lathi: Chapter 7, Sections 5,7 Lathi: Chapter 8, Sections 1-2
<b>Final Exam</b> (comprehensive)	

## 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

- 1. 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 homework assignments will be accepted late (see Homework Assignments section above).
- Computer assignments will be accepted up to two weeks late (but not later than the final exam) with a 10 point penalty.
- 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.

- 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.

9-9-13	Deadline to drop for tuition refund
10-31-13	Deadline to withdraw without academic penalty and to receive a grade of <b>W</b> 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/](http://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](http://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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