

# EE2353: CONTINUOUS-TIME SIGNALS AND SYSTEMS

## SYLLABUS FOR FALL 2015 (Ver. 1, 8/25/15)

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**OFFICE HRS.:** Monday - Thursday 11:20-12:20 PM  
Friday (unless other meetings overlap) 11:30-12:20 PM (send e-mail or call before to confirm)

**CLASS TIME/PLACE:** Tuesday & Thursday 7:30 - 8:50 AM in Classroom Bldg. (CRBL) 305

**TEXTBOOK:** SIGNALS, SYSTEMS AND TRANSFORMS, **FIFTH EDITION** by C. L. Phillips, J M. Parr, and E. A. Riskin, Prentice-Hall, 2014. Use of earlier editions is OK but you are responsible for tracking any differences and the accuracy of section and problem numbers from the textbook. This is the book URL:  
[http://www.ee.washington.edu/class/SST\\_textbook/textbook.html](http://www.ee.washington.edu/class/SST_textbook/textbook.html)

**Catalog Description:** Representation and analysis of continuous time signals; time and frequency analysis of linear time-invariant systems; convolution, differential equations, Laplace transform, Fourier series and transform, filters.

**Prerequisites:** MATH1312 Calculus 2, and MATH 2326 Differential Equations, all with a minimum grade of "C".

**Corequisite:** EE2351 Electric Circuits 2 (thus, EE2350 Electric Circuits 1 is a prerequisite).

**Prerequisites by topic:** Calculus and Differential Equations; Complex Numbers and Functions; Basic Circuit Analysis; Familiarity with MATLAB.

**Critical Course Outcomes.** By the end of the semester you will (at least) demonstrate the ability to:

- Determine characteristics of continuous time signals and systems such as linearity, time invariant, period, frequency, power, and energy.
- Apply convolution and its properties to solve Linear Time Invariant systems.
- Use Fourier series, Fourier transforms and its properties to analyze continuous time signals and systems.
- Compute impulse and frequency responses of linear time invariant systems.
- Use the Laplace transform to analyze continuous time systems.

### COURSE GRADING

• In-class Semester Exams (2 in-class exams, open paper copy books or self-prepared notes)	<b>45% (*or 25%)</b>
• Homeworks, Matlab Projects	<b>10% (*same 10%)</b>
• Quizzes	<b>15% (*same 15%)</b>
• Comprehensive Final Exam, during Final Exams week	<b>30% (*or 50%)</b>
TOTAL	<b>100%</b>

**\* Alternative weighting used only if it gives you a higher grade (this sometimes helps a few students improve one grade level)**

Note: Course drop deadline is: **October 30, 2015 (Friday)**

**USE OF E-MAIL:** Each student is required to read their officially registered UTEP e-mail account often enough to monitor ongoing information related to this course. All assignments will be sent via e-mail. Treat e-mail correspondence as a professional exchange of information. Use an accurate “Subject” and never “reply to all” when an e-mail is sent to the whole class.

**COMPUTER USAGE:** The MATLAB software package (with many Toolboxes) is made available via download or a DVD to all Engineering Students from the Engineering Technology Center (ETC)  
Engineering building E351D (3<sup>rd</sup> floor between CRBL and Eng. Bldg.) <http://etc.utep.edu/>  
Mon. – Thu: 8AM – 7PM; Friday 8AM – 5 PM, Tel. (915)747-5223, E-mail: [etchelpdesk@utep.edu](mailto:etchelpdesk@utep.edu)

**TOPICS TO BE COVERED FROM THE TEXTBOOK** (the exact order, pages and/or sections and subsections will be listed in homework assignment handouts). See the Appendices for very useful review and reference material!

I- Continuous-Time (C-T) Signals and Systems (Chapter 2)

- a) Axis and amplitude transformations and basic properties.
- b) Common signals used in the course.
- c) Definition and properties of continuous-time systems.

II- Continuous-time Linear Time-Invariant (LTI) Systems (Chapter 3)

- a) Impulse response of LTI systems
- b) C-T convolution: its role and computation
- c) Properties of LTI systems

III- Fourier Series (FS) (Chapter 4)

- a) Definition, obtaining the FS coefficients.
- b) Frequency Spectra of periodic signals.
- c) FS and transformations of signals.
- d) FS and LTI system responses.

IV- Fourier Transform (FT) (Chapter 5 and parts of 6)

- a) Basic transform pairs for important signals
- b) Basic transform properties and applications
- c) Applications to LTI system analysis
- d) Real Filters: RC circuits filters; Butterworth, bandpass, and active filters.
- e) Sampling and reconstruction theory.
- f) Intro. to AM modulation.

V- Laplace Transform (LT) (Chapter 7)

- a) Basic transform pairs for important signals
- b) Basic transform properties and applications
- c) Application of LT to LTI system analysis
- d) Relationship of bilateral LT to CTFT

## **EFFORT, PARTICIPATION and ETIQUETTE:**

- Students that are clearly not doing the homeworks, are failing quizzes and who fail Exam 1 will be dropped from the course by the instructor unless there are provable extenuating circumstances (let's discuss it).
- Show up on time. Habitual late comers may not be allowed in class without a pre-approved justification.
- Leaving early is considered disruptive due to the limitations of our classroom. Inform the instructor ahead of time if you must leave early and sit near the door to minimize disruptions.
- Ask questions, your fellow students will also benefit.
- Bring your book to class.
- Turn down the sound on cell phones, beepers, i-pods, etc. during the class period.

## **ACADEMIC INTEGRITY**

Please review the statements below and UTEP's Web page on Policy on Academic Integrity at:

<http://sa.utep.edu/osccr/academic-integrity/>

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another person's as ones' own. And, collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Violations will be taken seriously and will be referred to the Dean of Students Office for possible disciplinary action. Students may be suspended or expelled from UTEP for such actions.

Academic dishonesty is an assault upon the basic integrity and meaning of a University. Cheating, plagiarism, and collusion in dishonest activities are serious acts which erode the University's educational and research roles and cheapen the learning experience not only for the perpetrators, but also for the entire community. It is expected that UTEP students will understand and subscribe to the ideal of academic integrity and that they will be willing to bear individual responsibility for their work. Materials (written or otherwise) submitted to fulfill academic requirements must represent a student's own efforts. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Violations will be referred to the Dean of Students Office for possible disciplinary action. Students may be suspended or expelled from UTEP for such actions.