THE CITADEL
THE MILITARY COLLEGE OF SOUTH CAROLINA

Department of Electrical & Computer Engineering

ELEC 309 Signals and Systems
Course Syllabus
Fall 2009

Prerequisites: ELEC 202 (with a grade of C or better), ELEC 204, ELEC 206, MATH 234; prerequisite or corequisite: MATH 335

Course Description: The study of continuous and discrete systems utilizing Laplace and z-transform theory; Fourier analysis of continuous-time signals; Sampling.

Instructor:
Professor Siripong Potisuk
Office: Grimsley Hall Rm.312
Phone: (843) 953-4895
E-mail: siripong.potisuk@citadel.edu
Office hours: 1300 – 1700 Monday &Wednesday
1300 – 1500 Friday
Others by appointment

Class schedule: Three Credit Hours
1000 – 1050 Monday, Wednesday & Friday – Section 01 (SCCC)
1845 – 2000 Monday & Wednesday – Section 81 (CGC)
Room: GRIMS 328

Required Text: M. J. Roberts, *Fundamentals of Systems and Signals*, McGraw-Hill, 2008. (ISBN 978-0-07-340454-7)

References:
1) Alan V. Oppenheim, Alan S. Willsky with S. Hamid Nawab, *Signals and Systems*, 2nd Edition, Prentice Halll, 1997. (ISBN 0-13-651175-9)
2) B. P. Lathi, *Linear Systems and Signals*, 2nd Edition, Oxford University Press, 2005. (ISBN 978-0-19-515833-5)

Course Objective: This course is aimed at the study of techniques used to describe, classify, analyze, and design systems in both the time and frequency domains. Emphasis is placed on the study of linear, time-invariant system. Topics include convolution, Fourier transform method, Laplace transform method, and z-transform method. Applications to communication systems, signal filtering, and automatic control systems will be discussed.

Grading Policy:

Homework	10%
Quizzes	5%
Computer Projects	10%
Two Tests (25% each)	50%
Final Exam (comprehensive)	25%

The following grading system will be adopted as a guideline for assigning a letter grade. This guideline is subject to change depending upon the overall class performance as well.

A :	86 – 100	B :	76 – 85.9	C :	66 – 75.9
D :	56 – 65.9	F :	0 – 55.9		

Homework: 1) Homework will be assigned on a weekly basis and must be turned in at the beginning of class on the due date. Only neat and legible work will be accepted. Thus, it is recommended that all homework be written in pencil and only on one side of engineering paper. Late homework will incur a 50% penalty and be accepted no later than one week from the due date.
2) Homework will be graded for effort and correctness. Solutions will be uploaded to the course webpage (**http://faculty.citadel.edu/potisuk**) one week after the due date. It is imperative that student periodically check the course webpage for updates and important news pertaining to the class.
3) While it is permissible and recommended to rely on fellow students for assistance, it is not permissible to copy any portion of another student's work and pass it off as your own. **CHEATING AND/OR PLAGIARISM IN ANY FORM WILL BE FULLY PROSECUTED UNDER THE CITADEL HONOR CODE.**

Computer Projects: Computer projects using MATLAB form an integral part of this course and will be assigned throughout the semester. Students are expected to be well versed in MATLAB programming.

Attendance: Class attendance is mandatory. Student is required to notify the instructor, if possible, in advance should it be necessary to miss a class for any reason and will be responsible for any material missed. Absences in excess of 20% of the class meetings will result in a failing grade for the course. Unexcused absence from a test or a final exam will result in a zero for that test or exam. Excused absence will be granted under extreme circumstances only (guard duty is not considered an extreme circumstance).

Special Accommodations: Any students requiring special accommodations for learning disabilities should provide the instructor with verifiable written documentation of their needs as early in the semester as possible (i.e., within the first two weeks of the semester). This will ensure that the students have ample opportunity to succeed in their academic pursuits.

Important Dates:

Tuesday, September 1st	SCCC Drop/Add ends
Friday, September 4th	CGC Drop/Add ends
Monday, September 7th	Labor Day (No Classes for CGC only)
Wednesday, September 30th	Test I
Monday, October 12th	Last Day to Withdraw with grade of "W"for CGC
Wednesday, October 20th	Last Day to Withdraw with grade of "W"for SCCC
Wednesday, November 11th	Test II
Friday, November 20th	Fall Break begins
Sunday, November 29th	Fall Break ends
Tuesday, December 8th	Classes end

Wednesday, December 9th	CGC Final Examination (1745 – 2045 hrs, GRIMS 328)
Thursday, December 10th	SCCC Final Examination (0800 – 1100 hrs, GRIMS 328)

Lesson Plan:

# of Hours	Topic	Reading
6	Introduction; Review of Complex Analysis; Classification of Signals; Mathematical Description of Continuous-Time Signals: Signal Transformations, Signal Characteristics, Elementary Signals, Signal Decomposition.	Chapters 1, 2
6	Classification of Systems, System Models, Properties of Continuous-Time Systems, Time-Domain Analysis of Continuous-Time Linear Time-Invariant (CT-LTI) Systems: Convolution Integral, Impulse Response, Differential Equation Representations, Block Diagrams.	Chapters 4, 6
6	Continuous-Time Fourier Series and Fourier Transform, Connection between the Fourier and Laplace Transforms	Chapters 8, 10
9	Characterization and Analysis of CT-LTI Systems Using the Fourier and Laplace Transforms, System Realization, Frequency Response, Bode plots, Filter Design, System Stability	Chapters 12, 15
3	Sampling	Chapter 14
6	Mathematical Description of Discrete-Time (DT) Signals; Discrete-Time Systems Properties; Time-Domain Analysis of DT-LTI Systems; Convolution Sum; Difference Equation Representation.	Chapters 3, 5, 7
3	Characterization and Analysis of DT-LTI Systems Using the z-Transform.	Chapter 16
3	Two Tests.	