Prerequisite: ELEC 309

Course Description: An introduction to feedback control systems, system representation, stability, root-locus and frequency response, and compensation.

Instructor: Professor Siripong Potisuk  
Office: GRIMS 334  
Phone: (843) 9534895  
E-mail: siripong.potisuk@citadel.edu  
Office hours: 1300 – 1700 MW, 1300 – 1500 F  
Others by appointment

Class schedule: (Three Credit Hours)  
1100 – 1150 (Section 01), MWF  
1715 – 1830 (Section 81), MW  
Room: GRIMS 328


Course Webpage: http://faculty.citadel.edu/potisuk

Course Outcomes: A student who successfully fulfills the course requirements will have demonstrated  
1. an ability to obtain mathematical models of simple electrical and mechanical systems.  
2. an ability to construct block diagrams and signal flow graphs of system interconnections.  
3. an ability to perform stability and sensitivity analyses of LTI feedback systems.  
4. an ability to design compensators to meet specifications in time or frequency domain.  
5. an ability to use computer-aided tools for control system analysis and design.

Grading Policy:  
Homeworks (two lowest scores dropped)  18%  
MATLAB Simulation Projects  10%  
Announced Quizzes (the lowest score dropped)  14%  
Two In-class Tests  28%  
Final Exam (Comprehensive)  30%  
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 : 90 – 100%  B : 80 – 89.9%  C : 70 – 79.9%  D : 60 – 69.9%  F : 0 – 59.9%

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 homework be written in pencil and only on one side of engineering paper. Late homework
will not be accepted under any circumstances; however, to accommodate unforeseen or extenuating circumstances, electronic images of the homework will be temporarily accepted until a hard copy can be submitted.

2) Homework will be graded and solutions will be distributed in class or uploaded to the course webpage no later than 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.

Computer/Hardware Projects:
MATLAB/SIMULINK computer projects form an integral part of this course and will be used to reinforce concepts learned during lecture. Students are expected to be well versed in basic MATLAB programming. The use of MATLAB control system toolbox and SIMULINK will be introduced throughout the semester. Approximately two projects will be assigned and students are required to carry out their project work individually and independently of others.

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. It is noted that the date of the final exam is set by the Registrar’s office and cannot be changed. Unexcused absence from a test or 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).

Classroom Policy
Classroom environment is an important factor for effective learning. Students are expected to strictly follow certain rules and regulations so as not to create unnecessary distractions and interruptions during class.
1) Food and drinks are strictly prohibited in the classroom.
2) Students are prohibited from using electronic devices (i.e., smartphones, tablets, laptop computers) to access Internet contents unrelated to class materials.
3) Students are expected to show up to class on time. Attendance will be called at the beginning of every class, and the results reported via the Citadel’s electronic class absence system.
4) Students are to refrain from talking to other students during class. Extraneous conversation creates noise and diminishes one’s ability to concentrate and pay attention.

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. To request academic accommodations, students must register with the Academic Support Center at 953-1820.

Academic Honor Policy:
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.

Important Dates:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Monday, January 15th</td>
<td>Martin Luther King Jr. Day (No classes for SCCC and CGC)</td>
</tr>
<tr>
<td>Tuesday, January 16th</td>
<td>SCCC Drop/Add ends</td>
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<tr>
<td>Monday, January 22nd</td>
<td>CGC Drop/Add ends</td>
</tr>
<tr>
<td>Wednesday, January 31st</td>
<td>SCCC and CGC Quiz #1</td>
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<tr>
<td>Monday, February 12th</td>
<td>SCCC Quiz #2</td>
</tr>
<tr>
<td>Wednesday, February 14th</td>
<td>CGC Quiz #2</td>
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<tr>
<td>Wednesday, February 14th</td>
<td>Test I</td>
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</tbody>
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Lesson Plan:

<table>
<thead>
<tr>
<th># of Weeks</th>
<th>Topic</th>
<th>Reading</th>
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</thead>
<tbody>
<tr>
<td>3.5</td>
<td>Introduction to Control Systems. Mathematical Modeling of Control Systems Described by Linear Constant Coefficients Differential Equations. Transfer-function and Block-diagram Representation of Control Systems. System Interconnection and Reduction of Multiple Subsystems.</td>
<td>Chapters 1,2,3,5</td>
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<tr>
<td>1.5</td>
<td>Stability analysis based on Routh-Hurwitz Stability Criterion. Steady-state errors</td>
<td>Chapters 6,7</td>
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<tr>
<td>1</td>
<td>Two In-class Tests and Announced Quizzes</td>
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