TEMPLE UNIVERSITY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

EE 5412 (CRN7686) **Course Syllabus** **Fall 2011**

EE 5412-001 (EE524) – Control System Analysis (3 S.H.)

Description: The objective of this course is to study analysis techniques of a linear control system. We will briefly review classical control theory in the beginning of the course. Then the linear system theory topics will be covered. We will discuss mathematical description of linear systems, and learn advanced linear algebra including vector space, similarity transformation, diagonal form, Lyapunov equation, etc. Then we will study state space solutions, stability, controllability, and observability of a linear system. Because of the importance of the use of computer aided design for practicing engineers and researchers, students will be required to use MATLAB in this course.

Pre/Co-requisites: EE3412 Classical Control Systems
ENGR5022 Engineering Analysis and Applications (Linear Algebra)

Instructor: Chang-Hee Won, Ph.D.
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Course URL (Blackboard): http://blackboard.temple.edu

Lectures: Time: Tuesday 5:30 p.m. to 8:00 pm
Place: Engineering and Architecture Building, Room 716

Office Hours: Tuesday 4:30pm – 5:30pm, Wednesday 1pm –2pm, Thursday 2pm – 3pm.

Required Textbook: *Linear System Theory and Design*, C. T. Chen, 3rd Edition

Reference Textbook: *Linear Systems*, Panos Antsaklis and Anthony Michel
Feedback Control of Dynamic Systems, Gene F. Franklin, J. David Powell, Abbas Emami-Naeini

Student and Faculty Academic Rights and Responsibilities Policy:
Freedom to teach and freedom to learn are inseparable facets of academic freedom. The freedom to learn depends upon appropriate opportunities and conditions in the classroom, on the campus, and in the larger community. The university and the faculty have a responsibility to provide students with opportunities and protections that promote the learning process in all its aspects. Students similarly should exercise their freedom with responsibility.
http://policies.temple.edu/getdoc.asp?policy_no=03.70.02

Course Grading Policy:

The relative weight of the different types of work used to assess individual performance in the course is provided in the following table:

Homework/Quizzes/Participation	30%
Exam I	30%
Exam II	40%

In the event of extenuating circumstances, such as illness or a family emergency, job related travel, an extension may be granted for an announced quizzes or tests. **Documentations are needed for extension.** If this is the case, please communicate with the instructor *before* the due date. Unless the extension is granted by the instructor, the late submissions of the quizzes, tests, and homework will receive a grade of zero.

Students do have to hand in the homework in the **beginning** of the class. The homework will receive full credit for handing them in and zero for not handing it in, but individual problems will not be graded, however, the homework problems may appear on the exams, either verbatim or in a slightly modified form. So, it is advantageous to do the homework. Homework is an integral part of this course. I suggest you work with a partner in solving these problems.

There may be a number of announced and/or unannounced (pop) quizzes in this course. This will count as the homework/quiz grade. Homework, quizzes, and participation grade will have equal weight.

There will be no incompletes granted except for serious medical problems. No incomplete will be given on the basis of missed exams.

Final grades will be computed statistically by examining the averages of all students enrolled in the course. The *highest possible* grading curve is shown below:

A	94% – 100%
A–	90% – 93%
B+	87% – 89%
B	83% – 86%
B–	80% – 82%
C+	77% – 79%
C	73% – 76%
C–	70% – 72%
D+	67% – 69%
D	63% – 66%
D–	60% – 62%
F	< 60%

Special Considerations:
Any student who has a need for accommodation based on the impact of a disability should contact the course instructor privately to discuss the specific situation as soon as possible. Contact Disability Resources and Services at 215-204-1280 in 100 Ritter Annex to coordinate reasonable accommodations for students with documented disabilities. http://www.temple.edu/studentaffairs/disability/

Topics to be Covered:
Mathematical Descriptions of Systems, Linear Algebra, State Space Solutions, Realizations, Stability, Controllability, Observability, Minimal Realizations, and State Feedback and State Estimation.

Academic Integrity:
You are strongly encouraged to discuss assignments and course material with your classmates. Note that discussion does not mean copying. For any incident of copying the person or persons who copied as well as the person or persons who were copied from will receive zero for that assignment, quiz, or test. A second incident of copying will result in an automatic "F" for the course for all parties involved!