Klipsch School of Electrical and Computer Engineering
College of Engineering
New Mexico State University

EE 555: Advance Linear Systems, 3.0 Credits
Spring 2007

Class Schedule: MW 10:30AM-11:20AM, F 10:30AM-1PM
Class Location: MW: Thomas & Brown, Rm 307, F: Thomas & Brown, Rm 102

Instructor:
Dr. Charles (Chuck) Creusere
Room 160D, Goddard Annex
Phone: 646-3919
email: ccreuser@nmsu.edu

Office hour: Monday 1-3, Tuesday, 9-11; by appointment.

Course Description:
This is an advanced level class that studies linear systems and the associated mathematical theory. The coverage of this class includes linear equations, spectral theory, normal matrices, projections, quadratic forms, and dynamical systems (both discrete and continuous time).

Recommended prerequisites: Math 480 or equivalent undergraduate linear algebra class.

Textbook:

C.T. Mullis, ECE5448: *Advanced Linear Systems Course Notes*, unpublished. Available for purchase at FedEx/Kinkos on University Ave.

Other Good Reference Books:

D.S. Berstein, *Matrix Mathematics: Theory, Facts, and Formulas with Application to Linear Systems Theory* , Princeton University Press, 2005, ISBN: 0691118027 .

R.A. Horn and C.R. Johnson, *Matrix Analysis*, Cambridge University Press, 1990, ISBN: 0521386322

C. Meyer, *Matrix Analysis and Applied Linear Algebra*, SIAM, 2001, 0898714540

Software:

None

Online Resources: WebCT

Course Objectives:

The objective of this course is to provide students with a solid foundation in linear algebra and matrix analysis-- the language of communications, control, and signal processing theory. This foundation will help to enable graduate students to understand research articles published in these fields. This objective is achieved through an advanced level of understanding of essential algebraic, structural, and numerical properties of linear equations and systems.

Grading:

Homeworks: There will be weekly homework assignments chosen from the Mullis text. Worth 30% of the final grade. These problems may be solved cooperatively, but each student must turn in his or her own homework assignments. Furthermore, all problems must be submitted in the assigned order and a list of all students that the student worked with when solving a given problem must be provided at the top of the solution to that problem. Finally, all problem set must be placed into an opaque (e.g., manilla) envelop for submission (the envelope will be returned with the graded homework set in it). **Late assignments will not be accepted**

Presentations: There will be weekly presentations of individually selected problems chosen at random from the textbook. The lowest presentation score will be dropped. **These presentation problems must be solved on an individual basis (i.e., no group solutions)**, but you may come to the instructor for advice and guidance. Presentations should be written (or printed) out on blank transparencies prior to arriving at class. These presentations are worth 20% of the final grade and they will be made on the Friday of each week. Absence from the presentation period is not allowed accept in the case of a documented medical emergency or for other serious reasons at the discretion of the instructor.

Bonuses: Significant critique of presentations (pointing our incorrect assumptions or flaws in the proof) will be eligible for bonus points up to 5% per incident with a maximum of 10% applied to the final grade.

Exams: There will be a midterm exam, each worth 25% of the final grade. **Date:** *Friday, March 16, 10:30-12:30.*

Final: The final, comprehensive examination is worth 25% of the class grade. **Date**: *Monday, May 7, 10:30-12:30.*

Re-grading: If a student feels that the grading on any assignment or exam is in error, they must bring the problem to the instructor's attention within 1 week of receiving the graded assignment back from the instructor.

Policies:

Again, collaboration on weekly homework problems is allowed as long as all of the collaborators are identified. No discussion or collaboration is allowed for presentation problems except with the instructor.

EEO/ADA Information:

Feel free to call Jerry Nevarez, Director of Institutional Equity, at 505-646-3635 with any questions you may have about NMSU's Non-Discrimination Policy and complaints of discrimination, including sexual harassment.

Feel free to call Michael Armendariz, Coordinator of Services for Students with Disabilities, at 505-646-6840 with any questions you may have on student issues related to the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act of 1973. All medical information will be treated confidentially.

Prepared by: C. Creusere, 01/19/07