Syllabus for Satellite Communications and Navigation Systems  
ECE 6390 – Fall 2004

Class Description:

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<td>Greg Durgin</td>
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ECE 6390 Satellite Communications and Navigation Systems
A first-principles discovery of how satellite and navigation systems are designed and deployed. Topics include orbital mechanics, propagation, digital transmission, global positioning system, and other navigation issues.

Instructor:  Gregory D. Durgin  
Office: 511 Van Leer  
Office Hours: MWF – immediately after class  
Tuesdays 1:30-3:30 pm  
E-mail: durgin@ece.gatech.edu  
Office Phone: (404) 894-2951  
Class Web Page: TBA


Prerequisites: Graduate standing and some background in electromagnetics (ECE 3025 and/or 3065) and basic signal processing (ECE 2025). Elective work in antennas and communications is often helpful.

Grading:

15% Homework – Expect 8-10 homework assignments over the course of the semester. Homework will be assigned on Wednesday and collected the following Wednesday *at the beginning of class.* Late homework is not accepted.

55% Midterm Quizzes (3) – There will be 3 in-class quizzes, each testing material covered since the previous midterm quiz. The two highest midterm scores will count 20% each toward the final class grade; the lowest midterm score will only count 15% toward the final class grade.
30% Final Project – A final project will be assigned midway through the course. The project is due December 7th, 2004 at 12 noon.

**Quiz Dates:** Quizzes will be administered on the following days:
- Midterm 1 – 29th September 2004 (Wednesday)
- Midterm 2 – 29th October 2004 (Friday)
- Midterm 3 – 29th November 2004 (Monday)

Any change to this schedule will be announced with at least one week’s notice.

**Computer Usage:** The web will be used extensively in this class to disseminate homework assignments, lecture materials, and class announcements.

Some homework assignments may involve the use of Matlab\textsuperscript{tm} software. Most students should have access to this software through a university computer lab or their own personal computing packages. If not, please inform the instructor.

**Tentative Lecture Topics:**

I. Orbital Mechanics  
II. Spacecraft Systems  
III. Noise and Propagation  
IV. Antenna Design  
V. Satellite Modulation  
VI. SARSAT Navigation  
VII. Channel Impairments  
VIII. Global Positioning System  
IX. Future Navigation Systems  
X. Special Topics

**Honor Code:** The Honor Code applies to every aspect of this class, with only one noteworthy exception: student discussion of concepts and techniques for solving homework problems is permitted and even encouraged outside the classroom. However, *all submitted work must be original.*