

ECEN 601: Course Project

Instructor: **Dr. Henry Pfister**
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Office: Room 235A WERC
Office Hour: Tuesday 4:00 p.m. – 5:00 p.m.

Due Friday 12/11/09

Reading:

- For project ideas, see MMA Chap. 13-15

Overview:

This project is designed to help each student connect the material in this class with a practical problem that is relevant to their research. Ideally, this will help students acquire a general understanding of the manner in which abstract mathematics can be applied to solve real world problems. The project may be completed in groups of up to two people.

Outline:

1. Find a paper in your area of research that uses advanced techniques from this class. The problem setting or analysis should involve some Banach space, Hilbert space, orthogonal projections, or analysis of convergence (e.g., in an iterative algorithm). For ideas, try skimming the suggested reading and the papers posted on the website. If you find other good papers on your own, please e-mail me a link for future reference.
2. Submit a one page project proposal by Thursday, November 12th giving: the paper (or references) on which you will focus and an outline of what you plan to do.
3. Take some time to understand the algorithm and its analysis.
4. Perform a minimal simulation that evaluates its performance and effectiveness.¹ This may be completed in any programming language, but MATLAB is typically the most convenient for these types of problems.
5. Write a short report describing the technique and application (e.g., 2-3 pages per person). It is often helpful to think of this as a short tutorial designed to explain the algorithm and your simulation to your fellow classmates based on what we learned in this class.

¹Students wishing to do a purely theoretical project should obtain prior approval from the instructor.