Course Description
A rigorous course in channel coding fundamentals, including BCH/RS codes, convolutional codes, LDPC codes, and turbo codes. Prerequisites: ECE435, knowledge of probability, mathematical maturity.

Course Objectives
To give the student a sound treatment of modern error control coding principles and practice. We will discuss the encoding and decoding algorithms for each type of code, as well as their applications and performance. After completion of the course, the student should be able to design modern coding systems, including encoders and decoders, and possess sufficient background to tackle the leading publications in the field.

Textbook

References
R. Blahut, Theory and Practice of Error Control Codes, Addison-Wesley, 1983.

Instructor/Office Hours/Web Site
William E. Ryan, Professor
Office Hours: TBD
http://www.ece.arizona.edu/~ryan/ece637/

Grading
Homework: 15%
Quiz I: 20%
Project: 20% (simulation of selected coding schemes, includes extra credit work)
Quiz II: 20%
Final: 25%
Course Outline
1. Overview of Channel Coding and Channel Capacity
2. Requisite Mathematics (An Introduction)
3. BCH and Reed-Solomon Codes
4. Convolutional codes
5. Low-density parity-check codes
6. Turbo codes (time permitting)

Policy Issues

1. Late homework. Although I don't advise it, you may turn in your homework up to a week late. The number of percentage points that will be subtracted from a homework score will be 10% of the maximum score per day that it is late.

2. Working together on the homework. This is encouraged, but you need to turn in work that is your own, although you may have collaborated with a classmate on some of the problems. I am confident that you know what it is to cheat. If I find two homeworks with homework solutions that are identical, symbol for symbol on one or more problems, both will receive a grade of zero for the homework.

3. Grading of the homework. I will only grade selected problems in your homeworks, but I will provide solutions for all of them.

4. Cheating. If you cheat on a homework, exam, or project (cheating = turning in work that was performed entirely by another), you will receive a grade of zero for that item. If you cheat twice, you will receive a failing grade for the course.

5. Missed Exams. If it happens, I will need a letter from a doctor, police officer, etc. Otherwise you receive a zero for that exam. If I do get such a letter, you will not get the same exam or another exam, I will just use the other scores to compute your final grade.