SYLLABUS

Coding Theory, Spring, 2000

Instructor: James A. Davis   Office hours: MW 10:30-11:30
              206 Jepson Hall   TTh 8:30-9:30
              289-8094   or by appointment

I. **COURSE DESCRIPTION:** Coding Theory has developed over the last 50 years in response to the explosion of electronic communication and computing possibilities. In all of these applications, there is a recognition that electronic mistakes are always going to be a part of the systems that are being built. Coding theory addresses this problem by providing efficient ways to include redundancy. The ultimate goal is either to recognize that a mistake has been made and ask for retransmission or to correct the mistake that has been made. We will discuss techniques that have been used in real world situations.

The text for this course is "A first course in Coding Theory" by Raymond Hill. We will cover at least the first 8 chapters and cyclic codes.

II. **GRADING** The most important part of the grading will be in the homework assignments. This will account for 40% of the final grade. I will assign homework approximately once a week. There will be varying degrees of difficulty among the assigned problems, and the harder problems will get more points. I will assign about 70 points worth of homework each time, and you will turn in 50 points worth of problems (do not turn in all the problems and expect to get your best ones graded). Many of the homework assignments will have a $\star$ problem: in order to get an A in this course, you will need to complete 3 of these $\star$ problems perfectly with no help from anyone.

The second part of the grading involves in-class tests. There will be a midterm worth 20% of your final grade and a (comprehensive) final worth 25%. These tests will be designed to examine your understanding of <u>basic</u> concepts. I will try to keep these to mainly things that you have seen before. The purpose of these tests is to help you see the big picture of the course, not to kill you with details.

An in-class presentation will compose 15% of the grade. These can take many different shapes; some possibilities include doing a section in the book, writing a computer program to implement the codes that we talk about, doing some outside reading about how codes are designed and used, etc. This will provide an opportunity for you to study some advanced topic in detail, and then share that information with the rest of the class. We will discuss the topics in February, and you will present these after Spring break. I hope that you can choose a topic that is interesting to you, and that fits in with your particular background, and we will discuss how that can happen when we get around to picking topics.

III. **ATTENDANCE:** You are expected to attend each class, but there will not be a penalty for missing class.

IV. **ACADEMIC HONESTY:** Tests will be closed book, closed notes: you cannot receive help on the tests from anyone except me. Homeworks are a little fuzzier. I do not want them to be pledged; in fact, I strongly encourage you to work together. However, this does not include copying. My suggestion is to get together in study groups and talk through the problems, then go off by yourself to write the problems up. I will consider a direct copy of a problem an honor offense, and I will pursue that punishment. I recognize that if you work together, your answers will look very similar, so I will use my best judgement in each situation. I also expect you to write the people that you work with on the top of each homework.