

18.424 Course Information
Prof. Peter Shor

The course meets MWF 2-3 in room 2-143. This is one of the Math CI-M seminars, so you will be presenting much of the material. Susan Ruff is the Writing Across the Curriculum coordinator for the math department. She is available to help you with questions about presentations or term papers, and she is very good at giving advice to improve communication skills; I encourage you to talk to her.

There are four components to your grade

- class presentations (35%)
- term paper (30%)
- homework (25%)
- class participation (10%)

The class is about information theory. Information theory was essentially founded in 1948 by the paper "A mathematical theory of communication," by Claude Shannon. We will be going through the standard textbook on the series, "Elements of Information Theory," by Cover and Thomas, and the main focus of the first 18 periods or so will be on material leading to and relating to the three main theorems that Shannon proved in this paper. The next ten lectures or so will be on assorted topics – I can decide on these, but I'm open to suggestions if there is some appropriate material you would like to learn about. The last six or seven periods will be devoted to the students making 25-minute presentations on the topic of their term papers.

I will be presenting for the first three class periods, and I expect all the students to present two and a half class periods. This takes 36 of the scheduled 38 days of classes. Barring unforeseen cancellations, I will give two more presentations during the term.

I have broken the material down into logical sections, which I expect will take roughly one class period to present. Some of these are shorter than others, and when preparing lectures, it is quite difficult to judge how much time the material will take, so if you finish early, I will either have something prepared to say, or will take questions, or possibly will ask students to present the homework solutions.

Office hours are shortly before homework is due (I will post the times) and by appointment. I will be happy to go over your presentation with you before you give it. This can help improve your presentation substantially, so I encourage you to take advantage of this opportunity.

For your presentation, feedback is important. After each presentation. In previous terms, the student presentations have improved noticeably over the semester. To provide good feedback, I will have everybody in the class write a few sentences about what was good about each presentation, and what could be improved. I will distill these comments, add my own comments, and email the

student with these. The comments should be turned in on the "homework" part of Stellar, and I am expecting comments starting with the second lecture (which I gave Friday, 2/4). Please turn in the comments ... if you miss more than six of these (except for excused absences from class) it will affect your grade.

I will be giving homework every week or two for the first half of the course. This part is the foundation of information theory, and I would like all of you to learn it (and homework will help you learn). There will be around five homeworks. You may hand them in during class, or on Stellar. Handwritten homeworks will only be accepted in class.

For the term paper, I expect you to decide on a topic by March 16 (this topic is non-binding ... it can always be changed). The first draft is due by April 18. The final draft is due on the last day of class. I will give comments on the first draft, and it will also be peer-reviewed by one of your fellow students. The term paper is expected to be around 5000 words long (a little over 10 pages), and on some topic related to information theory.