SYLLABUS

EE 561 INFORMATION THEORY (Fall 2009)

Objective: This course provides the understanding for fundamental limits of representation and transfer of information.

Weekly lectures: MWF 1:25 - 2:15 PM, 120 Sackett

Instructor: Prof. Aylin Yener, yener@ee.psu.edu, 228A EE West, (814) 865-4337.

Instructor office hours/discussion hour: TBA or by appointment.

Electronic resources: Assignments, solutions etc. will be on ANGEL https://cms.psu.edu


Requirements: Fluency in random variables, random processes, and calculus.

Course Outline:

1. Entropy, relative entropy and mutual information (Chapter 2)
2. Asymptotic equipartition property (Chapter 3)
3. Entropy rates of stochastic processes (Chapter 4)
4. Data compression (Chapter 5)
5. Channel capacity (Chapter 7)
6. Differential entropy (Chapter 8)
7. The Gaussian channel (Chapter 9)
8. Network Information Theory (Chapter 15)
9. Relevant topics in Information Theory today (References)
10. Rate-distortion (Chapter 10)

Grading: Homeworks (10%), midterm (40%), final exam [May include a presentation] (50%).

Homework: Homeworks will include required as well as suggested exercises. You will only have to hand in the solutions of the required problems (NO late homeworks). A random subset of the required assignments will be graded. You are encouraged to discuss the problems with your classmates. You will find that discussions are exceptionally useful in grasping the fundamental concepts in this course.

Academic Integrity: See http://www.psu.edu/dept/oue/aappm/G-9.html for the academic integrity policy of the university. The sanctions as per this policy will be pursued to their full extent if necessary.