ECE 563 - Information Theory Fall 2019

Lectures: TTh 12:30-1:50pm, ECEB 2015

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Course Webpage:

https://courses.engr.illinois.edu/ece563/

Note that homeworks and notes will be posted on the class website. Homeworks are due in class, at the start of the lecture. Late homeworks will be penalized based on time of submission, or rejected if turned in more than one day past the deadline.

Project paper topics and reading materials will be posted on the class website.

Textbook


- Further readings and lecture notes will be provided through the course website.

Reference Texts (available at Grainger Engineering Library)

- I. Csiszár and J. Korner, Information Theory: Coding Theorems for Discrete Memoryless Systems

- Information measures and their properties: Shannon entropy, Renyi entropy and beyond

- Concentration of measure, asymptotic equipartition property

- Source and channel coding

- Variable-length and universal source coding

- Huffman codes
• Lempel-Ziv coding
• Entropy rates for stochastic processes
• Slepian-Wolf theorem
• Noisy channel coding theorem
• Source-channel separation
• Constrained coding
• Strong data processing inequalities and applications
• Large deviations and error exponents
• Quantization theory
• Rate-distortion theory
• Blahut-Arimoto algorithm
• Supplementary topics in statistics and machine learning (based on student feedback)

**Academic Integrity**

Academic integrity and discipline will be based on the standards set forth by the College of Engineering and the University of Illinois. The University has the responsibility for maintaining academic integrity so as to protect the quality of education and research on our campus and to protect those who depend upon our integrity. It is the responsibility of the student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions.

**Examples of Infractions of Academic Integrity**

A. Cheating -- Using or attempting to use in any academic exercise materials, information, study aids, or electronic data that the student knows or should know is unauthorized. During examinations, students should assume that external assistance (e.g., books, notes, calculators, conversation with others) is prohibited unless specifically authorized by the instructor. Substantial portions of the same academic work may not be submitted for credit more than once or by more than one student without authorization.

B. Fabrication -- Unauthorized falsification or invention of any information or citation in an academic endeavor. Fabrication also includes altering the answers given for an exam after the
examination has been graded. Fabrication also includes submitting false documents for the purpose of being excused from a scheduled examination or other academic assignment.

C. Facilitating Infractions of Academic Integrity -- Helping or attempting to help another to commit an infraction of academic integrity, where one knows or should know that through one's acts or omissions such an infraction may be facilitated. Examples include: 1) allowing another to copy from one's work during an examination, 2) taking an exam by proxy for someone else, and 3) unauthorized removal of an examination or quiz from a classroom, faculty office, or other facility (such as the proctor's office) would be committing a breach of academic integrity.

A complete listing of Infractions of Academy Integrity and University Policy can be found at this web site: http://studentcode.illinois.edu/article1_part4_1-401.html