Course Announcement

$$H[p] = -\sum_{i=1}^{k} p_i \log p_i$$

EECS 398
Information Science
Winter 2017

This course introduces students to several of the key technologies underlying today's information and communication technologies. It is suitable for sophomores and above in engineering and other STEM disciplines. The course introduces techniques such as how text, music, and pictures can be efficiently compressed into bits, how bits and analog signals, like voice, can be reliably transmitted using coding and modulation, how bits can be reliably encrypted, and how information can be extracted from big data using machine learning.

"From cell phones to Web portals, advances in information and communications technology have thrust society into an information age that is far-reaching, fast-moving, increasingly complex, and yet essential to modern life. This book distills and explains the most important concepts and insights at the core of this ongoing revolution." -- from the publisher of the acclaimed class textbook.

Projected Syllabus:
- 4-5 weeks: data compression, data transmission over noisy media, error correcting codes
- 2-3 weeks: Encryption, from historical ciphers to modern cryptosystems
- 3-4 weeks: Extracting information from data: information retrieval and machine learning
- 3-4 weeks: Frequency concepts: Fourier analysis, AM and FM radio, sampling and reconstruction, spectrum spreading, and digital signal processing

Instructor: Clayton Scott (clayscot@umich.edu)
Prerequisites: Math 116 and (Engineering 101 or equivalent)
Textbook: *Information Science* by David Luenberger
Meeting time: MW 9-10:30 and F 9:30-10:30 on North Campus
Grading: Weekly homework and in-class assignments, two exams, and an open-ended final project.

This **4 credit** course has been approved as a **flexible technical elective** for the CS-Eng, DS-Eng, and EE majors, and an EECS elective for the CE degree. For other majors, consult your academic advisor.