Instructor: Professor Amir H. Banihashemi, Office: 7034MC, Tel: 520-2600, Ext. 8026, Email: ahashemi@sce.carleton.ca.

Lectures: Wednesday, 11:30 a.m.– 2:30 p.m.

Office Hours: Wednesday, 10:00 – 11:00 a.m.

Course Description: Information theory, also referred to as "Theory of Communications," discusses the fundamental limits on data compression and data transmission in a communication system. These limits are respectively "entropy" and "channel capacity." We will cover as many of the following topics as permitted by the available time: Measure of information: entropy, relative entropy, mutual information, asymptotic equipartition property, entropy rates for stochastic processes; data compression: Huffman code, arithmetic coding; channel capacity: random coding bound, reliability function, Blahut-Arimoto algorithm, Guassian channels, colored Gaussian noise and "water-filling"; rate distortion theory; network information theory.

Prerequisites: SYSC 5503 (ELG 6153) or ELG 5119 (ISYS 5109) or equivalent, or the permission of the instructor.

Textbook:

References:

Grading Scheme: Composition of final mark: Final exam: 60% Quizzes: 40%

Assignments: There will be eight problem sets. The solutions will be posted on the web. regularly. It is strongly recommended that the students first work on the problems on their own, and if unsuccessful, discuss it with others, before looking at the solutions.

Quizzes: There will be four closed-book quizzes, each worth 10% of the total mark. They will be given on September 13, October 4, November 1 and November 22, during the first 30 minutes of the lecture time.

Final Exam: Is for the evaluation purposes only and will not be returned to the student. The final exam has 60% of the total mark. It is open book and covers all the material discussed during the lectures and in the assignments.
Special Arrangements:
You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: [http://www2.carleton.ca/equity/](http://www2.carleton.ca/equity/)

Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: [http://www2.carleton.ca/equity/](http://www2.carleton.ca/equity/)

Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable) at [http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines/](http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines/)

You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at [http://www2.carleton.ca/equity/](http://www2.carleton.ca/equity/)

Plagiarism: Plagiarism (copying and handing in for credit someone else's work) is a serious instructional offense that will not be tolerated. Please refer to the section on instructional offenses in the Undergraduate Calendar for additional information.