

ELEC 515

Information Theory

Fall 2017 (201709)

COURSE OUTLINE**Instructor** Dr. T. Aaron Gulliver

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Office Hours: Tuesday 12:30–14:30

Sections A01 CRN 11293 A02 11294**Lectures**

Tuesday 11:30–12:20 ECS 108
Wednesday 11:30–12:20 ECS 108
Friday 11:30–12:20 ECS 108

Course Description

Information theory and its relationship to probability, statistics, and data compression; entropy, relative entropy and mutual information; Huffman coding, arithmetic coding and Lempel-Ziv coding; channel capacity; group codes; generator and parity check matrices; Hamming codes and bound; bounds on the dimension of a linear code; random coding bounds; code construction.

Web Site

<http://www.ece.uvic.ca/~agullive/515.html>

Course Notes

ELG 5170 Information Theory: Course Notes, Jean-Yves Chouinard

Optional Text

Elements of Information Theory, Second Edition, Thomas M. Cover and Joy A. Thomas, Wiley, New York, 2006

Assessment

Five Assignments	40%	
Midterm Test	25%	Tuesday, October 24, 2017
Final Exam	35%	

Each assignment is worth 10% of the final grade. Completed assignments can be delivered to EOW 325 or submitted at lecture time.

Failure to complete the course requirements will result in a grade of N being awarded for the course.

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Graduate Calendar.

<http://web.uvic.ca/calendar2017-09/grad/academic-regulations/grading.html>

Learning Outcomes

At the completion of this course, the student should:

1. Understand the fundamentals of information theory.
2. Understand the principles and fundamental limits of data compression and transmission.
3. Know the basic concepts regarding communications over noisy channels.
4. Understand the need for error correcting codes in data communications and storage.

Note to Students

Students who have issues with the conduct of the course should first discuss them with the instructor. If these discussions do not resolve the issue, students should feel free to contact the Chair of the Department by email or the Assistant to the Chair to set up an appointment.

Accommodation of Religious Observance

<http://web.uvic.ca/calendar2017-09/general/policies.html>

Policy on Inclusivity and Diversity

<http://web.uvic.ca/calendar2017-09/general/policies.html>

Standards of Professional Behaviour

You are advised to read the Faculty of Engineering document Standards for Professional Behaviour, which contains important information regarding conduct in courses, labs, and in the general use of facilities.

<http://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf>

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the entry in the current Graduate Calendar for the UVic policy on academic integrity.

<http://web.uvic.ca/calendar2017-09/grad/academic-regulations/academic-integrity.html>

Equity

Reasonable and appropriate accommodation will be made to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the course requirements. Any accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, confidential resources are available on campus that can assist you in arranging for appropriate accommodation. Alternatively, you can contact the Resource Centre for Students with a Disability located in the Campus Services Building. The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment.

Course Materials

All course materials supplied to students are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.