

ECE515: Information Theory

Course Dates

CRN(s):	Section A01 CRN: 11084 Section A02 CRN: 11085
Term:	Fall 2022
Course Start:	2022-09-07
Course End:	2022-12-21
Withdrawal with 100% reduction of tuition fees:	2022-09-20
Withdrawal with 50% reduction of tuition fees:	2022-10-11
Last day for withdrawal (no fees returned):	2022-10-31

Scheduled Meeting Times (M=Mon, T=Tue, W=Wed, R=Thu, F=Fri)

Section:	Location:	Classes Start:	Classes End:	Days of week:	Hours of day:	Instructor:
A01	ECS 108	2022-09-07	2022-12-05	TWF	11:30-12:20	Aaron Gulliver
A02	ECS 108	2022-09-07	2022-12-05	TWF	11:30-12:20	Aaron Gulliver

Instructor(s)

Name: Aaron Gulliver
Office: EOW 325
Phone: (250) 721-6028
Email: agullive at engr dot uvic dot ca

Office Hours: Comments
Wed 12:30pm-02:30pm

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.

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.

Textbook

Optional Text
Title: Elements of Information Theory
Author: Thomas M. Cover and Joy A. Thomas

Optional Text

Publisher/Year: Wiley, 2006

Course Notes

Title: ELG 5170 Information Theory

Author: Jean-Yves Chouinard

Reference

Title: Information Theory Lecture Notes

Author: Stefan M. Moser

Online Learning, Teaching, and Tools

Website:

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

Assessment

Type	Weight	Date
5 Assignments	50%	TBD
Mid-term	20%	Friday, October 21, 2022
Final Exam	30%	TBD

Each assignment is worth 10% of the final grade.

Notes

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.

<https://www.uvic.ca/calendar/archives/202209/grad/index.php#/policy/B13jeiMdE?bc=true&bcCurrent=07%20-%20Grading&bcltemType=policies>

General Information

Note to Students:

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

Accommodation of Religious Observance:

<https://www.uvic.ca/calendar/archives/202209/grad/index.php#/policy/SkmigiMOV?bc=true&bcCurrent=17%20-%20Accommodation%20of%20Religious%20Observance&bcltemType=policies>

Policy on Inclusivity and Diversity:

Engineering: <https://www.uvic.ca/ecs/info-for/diversity-and-inclusion-supports/index.php#ipn-within-our-faculty>

Academic Calendar: <https://www.uvic.ca/calendar/archives/202209/grad/index.php#/policy/HkQ0pzdAN?bc=true&bcCurrent=General%20University%20Policies&bcltemType=policies>

<https://www.uvic.ca/ecs/info-for/diversity-and-inclusion-supports/index.php#ipn-within-our-faculty>

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.

<https://www.uvic.ca/ecs/assets/docs/student-forms/professional-behaviour.pdf>

Academic Integrity:

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.

https://www.uvic.ca/calendar/archives/202209/grad/index.php#/policy/BJujesM_E?bc=true&bcCurrent=02%20-%20Policy%20on%20Academic%20integrity&bcltemType=policies

Equality:

This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The 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, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the Centre for Accessible Learning located in the Campus Services Building: <https://www.uvic.ca/services/cal/>. The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

Course Lecture Notes:

Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and 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.

Sexualized Violence Prevention and Response at UVic:

UVic takes sexualized violence seriously, and has raised the bar for what is considered acceptable behaviour. We encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting www.uvic.ca/svp. If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support, please contact the sexualized violence resource office in Equity and Human Rights (EQHR). Whether or not you have been directly impacted, if you want to take part in the important prevention work taking place on campus, you can also reach out:

Where: Sexualized violence resource office in EQHR; Sedgewick C119

Phone: 250.721.8021

Email: svpcoordinator@uvic.ca

Web: www.uvic.ca/svp

Office of the Ombudsperson:

The Office of the Ombudsperson is an independent and impartial resource to assist with the fair resolution of student issues. A confidential consultation can help you understand your rights and responsibilities. The Ombudsperson can also clarify information, help navigate procedures, assist with problem-solving, facilitate communication, provide feedback on an appeal, investigate and make recommendations. Phone: 250-721-8357; Email: ombuddy@uvic.ca, Website: <https://uvicombudsperson.ca/>