

# **EENG 5940-001 - Advanced Topics in Electrical Engineering - Coding and Information Theory Spring 2023**

## **Course Description:**

This course discusses the fundamentals of modern information theory. Topics include the classic single user point to point information theory - entropy and source coding, mutual information and channel capacity, and modern applications of information theory to networks, storage, computation, and privacy. The focus is on analytical and mathematical techniques (e.g., typical sequence and random coding), with strong emphasis on research training.

## **Learning Objectives:**

The goals of this course are to expose the students to basic knowledge of information theory, ranging from information measures (entropy and mutual information), coding techniques to source and channel coding, and to prepare the students for advanced topics and research frontier in information and coding theory.

## **Lectures:**

Tu, Th, 13:00 - 14:20, NTDP B155.

## **Instructor:**

Hua Sun. Office: NTDP B225. Email: Hua.Sun@unt.edu.

Office Hours: Tu, Th, 14:30 - 15:30, NTDP B225.

## **Textbook:**

Thomas M. Cover, Joy A. Thomas, *Elements of Information Theory, 2nd Edition*, ISBN: 978-0-471-24195-9, Wiley-Interscience (July 2006).

Lecture notes and other supplementary materials are posted online.

## **Grading Policy:**

Homework: 10%

Midterm Exam: 40%

Final Exam: 50%

## **General Policies:**

- **Academic Integrity Standards and Consequences.** According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

- **ADA Accommodation Statement.** UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific

course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at [disability.unt.edu](http://disability.unt.edu).

- **Emergency Notification & Procedures.** UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials.

- **Attendance.** Students are expected to attend class meetings regularly and to abide by the attendance policy established for the course. It is important that you communicate with the professor and the instructional team prior to being absent, so you, the professor, and the instructional team can discuss and mitigate the impact of the absence on your attainment of course learning goals. Please inform the professor and instructional team if you are unable to attend class meetings because you are ill, in mindfulness of the health and safety of everyone in our community.