ECE 776 – Information theory

Description

This is a course on information theory and its applications at graduate level. Topics include basic concepts and definitions of information measure; asymptotic equipartition property and its applications; theory of data compression; definition and theory of channel capacity; rate distortion theory; network information theory.

Prerequisites

Basic knowledge of **random signal analysis** at the level of ECE 673 is required.

Instructor

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Textbook

Elements of Information theory
T. M. Cover and J. A. Thomas
Wiley.

Requirements

There is **one midterm (40%)**, **one final exam (40%)** and a **project** (**20%**) to be completed by the date of the final exam.

Schedule

Week	Plan	Chapter covered
1	Information Measures	2
2	AEP, Entropy Rate	3, 4
3	Data Compression	5
4	Channel Capacity	8

5	Channel Capacity	8
6	Channel Capacity	8
7	Midterm	
8	Differential Entropy	9, 10
9	Gaussian Channel	9, 10
10	Gaussian Channel	13
11	Gaussian Channel, Gambling	13
12	Rate Distortion Theory	14
13	Rate Distortion Theory	14
14	Project presentations	
15	Final	

Course Learning Outcomes

- Learn the fundamental principles of information theory
- Apply the principles of information theory to compression and reliable communication

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NJIT Honor Code

The NJIT Honor Code will be upheld, and any violation will be brought to the immediate attention of the Dean of Students.