

# Information Theory

Lecture 0: Course Outline

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## Recommended Textbooks

- "An Introduction to Information Theory" by Fazlollah M. Reza, Dover Publications, 1994, ISBN 0-486-68210-2 (main book).
- Supportive Books
  - "An Introduction to Information Theory" by John R. Pierce, Dover Publications, 1980, ISBN 0-486—24061-4 (supportive book).
  - "Digital Communications", 5th edition, J. Proakis and M. Salehi, McGrawHill, 2008

# Assessment

- Exams (Closed Book):
  - Mid Semester
  - Final Exam
- Scheduled Tests and Assignments

# Grading

- Tests and Assignments: 10%
- Mid Semester 20%
- Final Exam 70%

# Course Outline

- Introduction to Information Theory
- Basic Information Theory
- Information Transmission Rate
- Coding of Information
- An Application of Binary Trees and Priority Queues: Huffman Coding
- Transmission in a Noisy Channel
- Mutual Information and Channel Capacity
- Basics of Coding Theory

# Goal

- These basic theories and Principles will help students answer two fundamental questions in communication theory:
  - What is the ultimate data compression?
  - What is the ultimate transmission rate of communication?