



# Information Theory

## ECE 7005

**Credit Hours:**

3.00 - 3.00

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**Course Levels:**

Graduate (5000-8000 level)

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**Course Components:**

Lecture

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**Course Description:**

Mathematical models for channels and sources: entropy, information, data compression, channel capacity, Shannon's theorems, rate distortion theory.

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**Prerequisites and Co-requisites:**

Prereq: 6001 (804).

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**Course Goals / Objectives:**

- Introduce information theory, the mathematical theory of communication
  - Use entropy as a measure of information
  - Learn information theoretic principles and literature for application in MS and PhD research
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**Course Topics:**

- Entropy and mutual information
  - Asymptotic equipartition principle
  - Entropy rate
  - Data compression and discrete sources
  - Channel capacity
  - Differential entropy
  - Gaussian channels
  - Rate distortion theory
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**Designation:**

Elective