

Course Information	
Course title	Information Theory
Semester	108-1
Designated for	COLLEGE OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE GRADUATE INSTITUTE OF ELECTRICAL ENGINEERING
Instructor	I-HSIANG WANG
Curriculum Number	EE5028
Curriculum Identity Number	921 U1190
Credits	3.0
Course Syllabus	
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Course Description	Information Theory is a senior (undergraduate) level course designed for students who are interested in the quantitative fundamental limits of information. What is information and how to quantify information? What is the ultimate data compression rate and what is the ultimate transmission rate of communication? In this course, we introduce the fascinating theory originated from Claude E. Shannon, which addresses the above fundamental questions in communication theory. We will develop methods and coding techniques to achieve these fundamental limits. Finally, we will also demonstrate the application of information theory to other fields, including statistics (hypothesis testing and estimation) and statistical inferences.
Course Objective	<ol style="list-style-type: none"> 1. Introduce basic topics in information theory, including measures of information, source coding theorem, channel coding theorem, and source-channel separation. 2. Develop methods and coding techniques to achieve these fundamental limits. 3. Show applications of information theory beyond communications, especially in high dimensional statistics and statistical inferences.
Course Requirement	Prerequisite: Probability, Linear Algebra, Optional: Random Processes, Communication Systems Homework (30%), Midterm (30%), Final (40%)
Office Hours	

References		<div>1. T. Cover and J. Thomas, Elements of Information Theory, Second Edition, Wiley-Interscience, 2006.</div> <div>2. R. Gallager, Information Theory and Reliable Communications, Wiley, 1968.</div> <div>3. I. Csiszar and J. Korner, Information Theory: Coding Theorems for Discrete Memoryless Systems, Second Edition, Cambridge University Press, 2011.</div>
Progress		
Week	Date	Topic
No data		