#	Date	Reading	Topics
Part 1: Basic Definitions and Tools			
L1	3/31/20	C&T 2.1–2.5	Entropy, relative entropy, mutual information, chain rules.
L2	4/2/20	C&T 2.6–2.8	Convexity, Jensen's inequality, Markov chains, data processing inequality, log-sum inequality.
H1	4/7/20		Homework 1 is due before class.
L3	4/7/20	C&T Chapter 3	Asymptotic equipartition property.
L4	4/9/20	C&T Chapter 4	Entropy rates of a stochastic process.
H2	4/14/20		Homework 2 is due before class.
Part 2: Lossless Data Compression			
L5	4/14/20	C&T 5.1–5.5	Kraft inequality, limits on lossless compression.
L6	4/16/20	C&T 5.6–5.9 and Handout	Huffman coding, Shannon-Fano-Elias coding, arithmetic coding, Lempel-Ziv algorithms.
H3	4/21/20		Homework 3 is due before class.
Part 3: Capacity for Channels with Discrete Alphabets			
L7	4/21/20	C&T 7.1–7.5	Introduction to channel capacity.
L8	4/23/20	C&T 7.6–7.7	Discrete memoryless channel coding theorem.
H4	4/28/20		Homework 4 is due before class.
L9	4/28/20	C&T 2.10, 7.8 – 7.10	Fano's inequality, converse to channel coding theorem.
Part 4: Capacity for Channels with Continuous Alphabets			
L10	4/30/20	C&T Chapter 8	Differential entropy.
L11	5/5/20	C&T Chapter 9	Gaussian channel capacity.
H5	5/5/20		Homework 5 is due before class.
L12	5/7/20	C&T 2.9, 9.3–9.5	Capacity for band limited channels, water-filling, sufficient statistics.
Part 5: Lossy Data Compression			
L13	5/12/20	C&T 10.1–10.3	The rate-distortion function.
H6	5/12/20		Homework 6 is due before class.
L14	5/14/20	C&T 10.4–10.6	Proving the rate-distortion theorem.
L15	5/19/20	C&T10.7–10.8, Handout	Characterizing and computing $R(D)$, computing channel capacity via Blahut-Arimoto.
Part 6: Multi-User Information Theory			
H7	5/19/20		Homework 7 is due before class.
L16	5/21/20	C&T 15.1–15.3	The multiple access channel.
L17	5/26/20	C&T 15.4–15.5	Slepian-Wolf encoding of correlated sources.
H8	5/26/20		Homework 8 is due before class.
L18	5/28/20		Degraded broadcast channels.
Part 7: Advanced Topics			
L19	6/2/20		Finite blocklength communication and feedback.
L20	6/4/20		Maximum entropy distributions, optimal signaling.