SYLLABUS

Unit 0: Overview (released Fri. Jan 29)

Unit 1: Probability models and axioms (released Fri. Jan 29; Sections 1.1-1.2)
L1: Probability models and axioms
Problem Set 1 due on Feb 10

Unit 2: Conditioning and independence (released Fri. Feb 5; Sections 1.3-1.5)
L2: Conditioning and Bayes' rule
L3: Independence
Problem Set 2 due on Feb 17

Unit 3: Counting (released Fri. Feb 12; Section 1.6)
L4: Counting
Problem Set 3 due on Feb 24

- Unit 2: Conditioning and independence
- Unit 3: Counting
- Unit 4: Discrete random variables
- Exam 1
- Unit 5: Continuous random variables
- Unit 6: Further topics on random variables
- Unit 7: Bayesian inference
- Exam 2
- Unit 8: Limit theorems and classical statistics
- Unit 9: Bernoulli and

Unit 4: Discrete random variables (released Fri. Feb 19; Sections 2.1-2.7)
L5: Probability mass functions and expectations
L6: Variance; Conditioning on an event; Multiple r.v.'s
L7: Conditioning on a random variable; Independence of r.v.'s
Problem Set 4 due on Mar 2

Exam 1: Covers material from L1 to L7 (released Wed. Mar 2; due on Mar 9)

Unit 5: Continuous random variables (released Fri. Feb 26; Sections 3.1-3.5)
L8: Probability density functions
L9: Conditioning on an event; Multiple r.v.'s
L10: Conditioning on a random variable; Independence; Bayes' rule
Problem Set 5 due on Mar 16

Unit 6: Further topics on random variables (released Fri. Mar 11; Sections 4.1-4.3, 4.5)
L11: Derived distributions
L12: Sums of r.v.'s; Covariance and correlation
L13: Conditional expectation and variance revisited; Sum of a random number of r.v.'s
Problem Set 6 due on Mar 30

Unit 7: Bayesian inference (released Fri. Mar 25; Sections 3.6, 8.1-8.4)
L14: Introduction to Bayesian inference
L15: Linear models with normal noise
L16: Least mean squares (LMS) estimation

Poisson processes

- Unit 10: Markov chains
- Exit Survey

L17: Linear least mean squares (LLMS) estimation
Problem Set 7a due on Apr 6
Problem Set 7b due on Apr 13

Exam 2: Covers material from L8 to L17 (released Wed. Apr 13; due on Apr 20)

Unit 8: Limit theorems and classical statistics (released Fri. Apr 8; Sections 5.1-5.4, pp. 466-475)
L18: Inequalities, convergence, and the Weak Law of Large Numbers
L19: The Central Limit Theorem (CLT)
L20: An introduction to classical statistics
Problem Set 8 due on Apr 27

Unit 9: Bernoulli and Poisson processes (released Fri. Apr 22; Sections 6.1-6-2)
L21: The Bernoulli process
L22: The Poisson process
L23: More on the Poisson process
Problem Set 9 due on May 11

Unit 10: Markov chains (released Fri. Apr 29; Sections 7.1-7-4)
L24: Finite-state Markov chains
L25: Steady-state behavior of Markov chains
L26: Absorption probabilities and expected time to absorption
Problem Set 10 due on May 18

Final Exam (released Wed. May 18; due on May 24)

	***Note: Problem set and exam due dates are at the end of the specified date, at 23:59 UTC.**