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Topics:

1. Introduction
 - (a) Probability spaces
 - (b) Conditional probability
 - (c) Expectation and conditional expectation
2. Bernoulli Processes.
 - (a) Bernoulli Processes
 - (b) number and time of successes
 - (c) Sums of independent random variables
3. Poisson Processes.
 - (a) Poisson process
 - (b) Times of arrivals
 - (c) Forward recurrence time
 - (d) Superposition and decomposition of Poisson processes
 - (e) Compound and non-stationary Poisson processes
4. Discrete-time Markov Processes.
 - (a) Introduction
 - (b) Visits to a fixed state
 - (c) Classification of states
5. Limiting behavior of Markov chains
 - (a) Recurrent states and stationary distribution
 - (b) Transient states
 - (c) Periodic states and stationary distribution
 - (d) M/G/1 and G/M/1 queues

6. Continuous-Time Markov Processes.

- (a) Sample path behavior
- (b) Structure of Markov processes
- (c) Limiting distributions
- (d) Birth-death processes

7. More on queueing theory.

Background: EE-4660 or equivalent is a must prerequisite. The probability background should be at least at the level of EE4660.

Text: *Introduction to Stochastic Processes* by Erhan Cinlar, Prentice-Hall.