Topics for Exam 2

1. **Random Variables**

    1.1 Continuous and discrete random variables

    1.2 Cumulative distribution function (cdf)

    1.3 Probability density function (pdf) and probability mass function (pmf)

2. **Examples of Random Variables**

    2.1 Discrete random variables: Discrete Uniform, Bernoulli, Binomial, Geometric and Hypergeometric

    2.2 Continuous random variables: Uniform and Exponential

3. **Expectations of Random Variables**

    3.1 Expected value a random variable

    3.2 Properties of expectation

    3.3 Expected value of functions of random variables

    3.4 Moments and variance

    3.5 Moment generating function (mgf)

Relevant sections in the online class notes: 4.1, 4.2, 5.1, 5.2, 5.3 and 5.4.

Relevant sections in the text: 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 5.2, 5.3 and 5.4.

Relevant assignments: 7, 8, 9, 10, 11 and 12.

Important concepts: Random variable; continuous and discrete random variables; cumulative distribution function (cdf);, probability mass function (pmf); probability density function (pdf); expectation; moments; variance; moment generating function (mgf); independent random variables.

Important skills:

- Know how to compute the cdf and the pdf (or pmf) of a random variable.

- Know how to compute expectations, moments and variance of random variables.

- Know how to compute moment generating functions.