

## Topics for Exam 2

### 1. Continuous Random Variables

- 1.1. Probability density function (pdf).
- 1.2. Distribution of functions of random variables

### 2. Expectations of Random Variables

- 2.1. Expected Value a random variable
- 2.2. Expected value of functions of random variables
- 2.3. Moments and moment generating function
- 2.4. Variance of a random variable

### 3. Joint Distributions

- 3.1. Joint distribution of two random variables
- 3.2. Marginal distributions
- 3.3. Independent random variables

Relevant sections in the text: 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 5.2, 5.3 and 5.6.

Relevant sections in the lecture notes: 3.1, 3.2, 4.1, 4.2, 4.3, 4.4, 5.1, 5.2, 5.3 and 6.1.

Relevant assignments: 8, 9, 10, 11, 12, 13, 14, 15 and 16.

## Important Concepts

Expectation, moments, moment generating function, variance, joint distributions, marginal distributions, independent random variables.

## Important Skills

1. Know how to compute expectations, moments, variance and moment generating functions.
2. Know how to compute the joint cdf and the joint pdf (or pmf) of two random variables.
3. Know how to compute marginal distributions.
4. Know how to compute probabilities based on joint distributions.
5. Know how to use independence.