Terms from Probability Theory 1

Here is a list of some terms, concepts and results from the Probability Theory 1 course that you should be comfortable with:

- σ-algebra
- algebra
- measurable space
- event
- measure
- probability measure
- measure space
- probability space
- De Morgan's law
- Dirac measure
- counting measure
- continuity from below
- continuity from above
- Fatou's lemma for sets
- independent family of events
- Borel–Cantelli lemma
- zero-one law for a sequence of independent events
- (Carathéodory) extension theorem
- σ-algebra *generated* by a collection of subsets
- open subsets of $\mathbb{R}$
- closed subsets of $\mathbb{R}$
- Borel σ-algebra on $\mathbb{R}$

- density of a Borel measure on $\mathbb{R}$
- Lebesgue measure on $\mathbb{R}$
- Gaussian / normal distribution on $\mathbb{R}$
- Exponential distribution on $\mathbb{R}$
- measurable function / random variable
- simple function
- image / pushforward measure
- law of a random variable
- (cumulative) distribution function of a Borel measure on $\mathbb{R}$
- (cumulative) distribution function of a real-valued random variable
- discrete random variable
- continuous random variable
- trace of a σ-algebra on a subset
- independent family of random variables
- independent family of σ-algebras
- product of measurable spaces
- product measures
- Lebesgue measure on $\mathbb{R}^d$
- Lebesgue integral of a non-negative simple function
- Lebesgue integral of a non-negative measurable function
- What it means for a measurable function / random variable to be integrable / have finite expectation
- Monotone convergence theorem
- Fatou's lemma for integrals
- Dominated convergence theorem