

*Successful candidates of the MSc in Big Data degree will have a solid background in the following statistical and mathematical subjects:*

### **Probability and Statistics**

- **Combinatorics:** Cardinality of a set. Factorial of an integer, binomial coefficients. Binomial expansion.
- **Probability space:** Random experiments, events and probability measures. Basic properties of a probability measure. Conditional probabilities. Bayes formula. Formula of total probability. Independent events.
- **Random variables:** Discrete or continuous random variables. Usual discrete probability distributions. Generating function. Independence of random variables. Expectation of a random variable. Variance and covariance. Conditional distribution.
- **Statistics and Data analysis:** Mean, median, mode, range, standard deviation, interquartile range, quartiles and percentiles; interpretation of data in tables and graphs (line graphs, bar graphs, circle graphs, boxplots, scatterplots and frequency distributions).