

## Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
VM 512	Probability	1	4	0	0	3	8

Prerequisites	
Admission Requirements	

Language of Instruction	English
Course Type	Compulsory
Course Level	Masters Degree
Objective	Probability theory is one of the most important techniques used in data processing. The aim of this course is to provide the student with some the necessary background of the probability theory for data science and related statistical applications.
Content	Conditional probability; Bayes theorem; The course includes distribution functions, binomial, geometric, hypergeometric, and Poisson distributions, uniform, exponential, normal, gamma and beta distributions; joint distributions; Chebyshev inequality; central limit theorem. Introduction to Markov chains.
References	Sheldon Ross, An initiation to Probability Introduction to Probability for Data Science Stanley H. Chain

## Theory Topics

Week	Weekly Contents
1	Permutations, Combinations, Axioms of Probability
2	Conditional Probabilities
3	Bayes' Formula and Independent Events
4	Discrete Random Variables, Expectations of Discrete Random Variables, Variance
5	Binomial Random Variables, Poisson Random Variables
6	Midterm - Continuous Random Variables
7	Uniform Random Variables, Normal Random Variables
8	Exponential Random Variables
9	Joint Distribution Functions
10	Covariance and Correlation, Central Limit Theorem
11	Markov Chains