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	-The aim of this course is to introduce the fundamental concepts of probability theory and basic statistical methods used in data science and applied mathematics. Students will learn how to model uncertainty, analyze random phenomena, and interpret probabilistic models.
Content	This course covers the basic concepts of probability, conditional probability, and independence. Random variables and probability distributions will be introduced through both discrete and continuous models. Discrete distributions such as Bernoulli, Binomial, and Poisson distributions, as well as continuous distributions including Uniform, Normal, and Exponential distributions, will be studied. Joint distributions and related concepts will also be discussed. In addition, expectation, variance, and covariance will be introduced together with important theoretical result such as the Central Limit Theorem.-
References	

Theory Topics

Week	Weekly Contents
1	Introduction to Probability and Sample Spaces
2	Conditional Probability and Independence
3	Random Variables
4	Discrete Probability Distributions: Bernoulli and Binomial
5	Poisson Distribution and Applications
6	Continuous Probability Distributions: Uniform Distribution
7	Normal and Exponential Distributions
8	Midterm
9	Joint Distributions and Marginal Distributions
10	Expectation, Variance, and Covariance
11	Central Limit Theorem and Applications