



## Course Syllabus

<b>Course Code</b>	<b>Course Title</b>	<b>ECTS Credits</b>
MATH-225	Probability and Statistics I	6
<b>Prerequisites</b>	<b>Department</b>	<b>Semester</b>
MATH-101 or MATH-185, MATH-195	Computer Science	Fall, Spring
<b>Type of Course</b>	<b>Field</b>	<b>Language of Instruction</b>
Required	Mathematics	English
<b>Level of Course</b>	<b>Lecturer(s)</b>	<b>Year of Study</b>
1st Cycle	George Portides	2 <sup>nd</sup>
<b>Mode of Delivery</b>	<b>Work Placement</b>	<b>Corequisites</b>
Face to face	n/a	none

### Course Objectives:

The main objectives of the course are to:

- Demonstrate axioms, basic laws and theorems of probability.
- Define discrete and continuous random variables, their probability distributions, together with the expectation and variance for functions of random variables.
- Cover the characteristics of the most common probability distributions.
- Employ the most common statistics used to summarize data, demonstrate advantages and disadvantages, use visual techniques for presenting data.

### Learning Outcomes:

After completion of the course students are expected to be able to:

- Interpret probabilities and use the laws and basic theorems of probability to calculate probabilities.
- Define discrete and continuous random variables and how their probabilities are computed.
- Compute probabilities under common discrete and continuous probability distributions.
- Find expected values of random variables and their functions.
- Produce summary statistics and present data.

**Course Content:**

- Introduction to Probability, interpretations, Axioms and Laws of Probability, Conditional Probability, Bayes Theorem, Independence.
- Discrete Random Variables and Probability Distributions: Geometric, Binomial, Poisson random variables and some applications.
- Continuous Random Variables and Probability Distributions: Uniform, Exponential and Normal random variables and some applications.
- Expectation and Variance for discrete and continuous random variables.
- Data presentation and Descriptive Statistics: Relative and Cumulative Frequency distributions, Histograms and Bar Charts, Measures of Location and Dispersion.

**Learning Activities and Teaching Methods:**

Lectures, Exercises and Tests

**Assessment Methods:**

One test and one Final Exam

**Required Textbooks / Readings:**

Title	Author(s)	Publisher	Year	ISBN
Introduction to Probability	Grinstead C. and Snell L.	AMS	2012	978-0821894149
Introduction to Probability and its Applications, 3 <sup>rd</sup> edition	Scheaffer R. and Young .L.	Duxbury Press	2009	978-0534386719

**Recommended Textbooks / Readings:**

Title	Author(s)	Publisher	Year	ISBN
Probability & Statistics for Engineers &	Walpole R.E. and Myers R.H.	Pearson	2013	978-9332519084

Scientists, 9 <sup>th</sup> edition				
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