# Statistics and Probability Theory

**SCHOOL**
Faculty of Law, Economics and Business Studies (DEG)

**CAMPUS**
Saint-Serge

**LEVEL**
2nd year Bachelor's degree

**OPEN TO EXCHANGE STUDENTS**
Yes

**SEMESTER**
Fall (S1)

> **Degree course:** Economics et Management; Dual degree Law and Economics; Dual degree Math and Economics
> **Teaching unit:** UE2.4.1
> **Course language:** French
> **Duration (hours):** 14
> **ECTS:** 3
> **Teacher(s):** Enareta KURTBEGU

> **Assessment:**
[X] Continuous assessment
[X] Final exam

> **Teaching methods:**
[X] Lecture course 14 hours
[X] Tutorial course 12 hours
[ ] Practical work hours
[ ] Case study
[ ] Project

## COURSE DESCRİPTİON

**Chapter 1 : Probability**
- Probability measure / Conditional probability, Baye's theorem / Independence

**Chapter 2 : Random variables**
- Discrete random variables / Continuous random variables / Multivariate random variables / Properties of the expectation, variance, covariance and correlation

**Chapter 3 : Lois de probabilité usuelles**
- Discrete distributions (Uniforme distribution; Bernoulli distributions; Binomial distribution; Geometric distribution; Poisson distribution) / Continuous distributions (Uniforme distribution; Exponential distribution; Normal distribution; Khi2 distribution; Student distribution; Fisher distribution)

**Chapter 4 :Asymtotic properties**
- Notions of convergence (Convergence in probability; Convergence in distribution; Almost sure Convergence) / The Central Limit Theorem

## OBJECTİVES

-Provide the basic fundamental proprieties of probability measure, conditional probability and independent events.
-Understand the importance of random variables (discrete/continuous) and manipulate its basic statistics.
-Find the probability in a given concrete situation, based on the properties of diverse common probability distributions (discrete/continuous).
-Understand the importance of the Central Limit Theorem.

Keywords: Probability measure, Conditional probability, Bayes' theorem, random variables (discrete/continuous), joint probability distribution, marginal probability distribution, expectation, variance, covariance, correlation, independance, Uniform dicrete/continuous distribution, Binomial distribution, Geometric distribution, Poisson distribution, Normal Distribution, Student distribution, Chi-Squared distribution, Central Limit Theorem.

## PREREQUİSİTES

descriptive statistics class

## SELECTİVE BİBLİOGRAPHY

Statistics for Business & Economics, Anderson, Sweeney, Williams, Camm and Cochran, 2019
Statistics for business and economics, Newbold, 2013

## ADDİTİONAL İNFORMATİON

This class is taught in French and an English module is offered online. The slides are written in English. Moreover, we propose more explanations in english through several integrated videos. A tutorial class taught in English is proposed to Erasmus and French students. On top of the assignments discussed in English, a supplementary online module allows you to exercise with several examples using the "learning by doing" technique. Students have the possibility to write the mid-term and final exams in English. By the end of the semester, an official document is distributed to those who followed this class in English.