



University of Engineering and Technology
School of Computer Science
Syllabus of Course – Academic Period 2017-I

1. **Code and Name:** MA203. Statistics and Probabilities

2. **Credits:** 4

3. **Hours of theory and Lab:** 3 HT; 2 HP;

4. **Professor(s)**

Meetings after coordination with the professor

5. **Bibliography**

[Men14] Beaver Mendenhall. *Introducción a la probabilidad y estadística*. 13th. Cengage Learning, 2014.

[MRo14] Sheldon M.Ross. *Introduction to Probability and Statistics for Engineers and Scientists*. 5th. Academic Press, 2014.

6. **Information about the course**

(a) **Brief description about the course** It provides an introduction to probability theory and statistical inference with applications, needs in data analysis, design of random models and decision making.

(b) **Prerequisites:** EG1003. Matemática I. (1^{er} Sem)

(c) **Type of Course:** Mandatory

7. **Competences**

- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to identify, formulate, and solve real problems.

8. **Contribution to Outcomes**

a) An ability to apply knowledge of mathematics, science. (**Usage**)

j) Apply the mathematical basis, principles of algorithms and the theory of Computer Science in the modeling and design of computational systems in such a way as to demonstrate understanding of the equilibrium points involved in the chosen option. (**Assessment**)

9. **Competences (IEEE)**

C1. An intellectual understanding and the ability to apply mathematical foundations and computer science theory.⇒ **Outcome a**

CS2. Identify and analyze criteria and specifications appropriate to specific problems, and plan strategies for their solution.⇒ **Outcome j**

10. **List of topics**

1. Variable Type
2. Descriptive Statistics
3. Inferential Statistics

11. Methodology and Evaluation

Methodology:

Theory Sessions:

The development of the theoretical sessions is focused on the student, through his active participation, solving problems related to the course with the individual contributions and discussing real cases of the industry. The students will develop throughout the course a project of application of the tools received in a company.

Lab Sessions:

Practical sessions are held in the laboratory. Laboratory practices are performed in teams to strengthen their communication. At the beginning of each laboratory the development of the practice is explained and at the end the main conclusions of the activity in group form are highlighted.

Oral Presentations :

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

Reading:

Throughout the course different readings are provided, which are evaluated. The average of the notes in the readings is considered as the mark of a qualified practice. The use of the UTEC Online virtual campus allows each student to access the course information, and interact outside the classroom with the teacher and with the other students.

Evaluation System:

12. Content

Unit 1: Variable Type (6)	
Competences Expected: C1	
Learning Outcomes	Topics
<ul style="list-style-type: none">• Classify the relevant variables identified according to their type: continuous (interval and ratio), categorical (nominal, ordinal, dichotomous).• Identify the relevant variables of a system using a process approach.	<ul style="list-style-type: none">• Variable Type: Continuous, discrete
Readings : [MRo14], [Men14]	

Unit 2: Descriptive Statistics (6)	
Competences Expected: C1	
Learning Outcomes	Topics
<ul style="list-style-type: none">• Use central tendency measures and dispersion measures to describe the data gathered.• Use graphics to communicate the characteristics of the data gathered.	<ul style="list-style-type: none">• Central Tendency (Mean, median, mode)• Dispersion (Range, standard deviation, quartile)• Graphics: histogram, boxplot, etc.: Communication ability.
Readings : [MRo14], [Men14]	

Unit 3: Inferential Statistics (6)	
Competences Expected: CS2	
Learning Outcomes	Topics
<ul style="list-style-type: none"> • Propose questions and hypotheses of interest. • Analyze the data gathered using different statistical tools to answer questions of interest. • Draw conclusions based on the analysis performed. 	<ul style="list-style-type: none"> • Determination of the sample size • Confidence interval • Type I and type II error • Distribution type • Hypothesis test (t-student, means, proportions and ANOVA) • Relationships between variables: correlation, regression.
Readings : [MRo14], [Men14]	