

1. COURSE

MA203. Statistics and Probabilities (Mandatory)

2. GENERAL INFORMATION

- 2.1 Course : MA203. Statistics and Probabilities
 2.2 Semester : 4^{to} Semestre.
 2.3 Credits : 4
 2.4 Horas : 2 HT; 4 HP;
- 2.5 Duration of the period : 16 weeks
 2.6 Type of course : Mandatory
 2.7 Learning modality : Blended
 2.8 Prerequisites : MA100. Mathematics I. (1st Sem) MA100. Mathematics I. (1st Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO 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.

5. GOALS

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

6. COMPETENCES

- 1) Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions. (**Assessment**)
- 6) Apply computer science theory and software development fundamentals to produce computing-based solutions. (**Assessment**)

7. TOPICS

Unit 1: Variable Type (6)	
Competences Expected:	
Topics	Learning Outcomes
<ul style="list-style-type: none"> • Variable Type: Continuous, discrete 	<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.
Readings : [MRo14], [Men14]	

Unit 2: Descriptive Statistics (6)	
Competences Expected:	
Topics	Learning Outcomes
<ul style="list-style-type: none"> • Central Tendency (Mean, median, mode) • Dispersion (Range, standard deviation, quartile) • Graphics: histogram, boxplot, etc.: Communication ability. 	<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.
Readings : [MRo14], [Men14]	

Unit 3: Inferential Statistics (6)	
Competences Expected:	
Topics	Learning Outcomes
<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. 	<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.
Readings : [MRo14], [Men14]	

8. WORKPLAN

8.1 Methodology

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

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC 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.