# Peruvian Computing Society (SPC)
## School of Computer Science
## Sillabus 2021-I

**SPC**

**SOCIEDAD PERUANA DE COMPUTACIÓN**

## 1. COURSE
MA203. Statistics and Probabilities (Mandatory)

## 2. GENERAL INFORMATION
| | | |
|---|---|---|
| **2.1 Credits** | : | 4 |
| **2.2 Theory Hours** | : | 2 (Weekly) |
| **2.3 Practice Hours** | : | 2 (Weekly) |
| **2.4 Duration of the period** | : | 16 weeks |
| **2.5 Type of course** | : | Mandatory |
| **2.6 Modality** | : | Face to face |
| **2.7 Prerequisites** | : | MA100. Mathematics I. ($1^{st}$ 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

**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**)

## 7. SPECIFIC COMPETENCES

■NoSpecificOutcomes■

## 8. TOPICS

| Unit 1: Variable Type (6) | |
|---|---|
| **Competences Expected: C1** | |
| **Topics** | **Learning Outcomes** |
| • Variable Type: Continuous, discrete | • Classify the relevant variables identified according to their type: continuous (interval and ratio), categorical (nominal, ordinal, dichotomous). <br><br> • Identify the relevant variables of a system using a process approach. |
| **Readings :** [MRo14], [Men14] | |

| Unit 2: Descriptive Statistics (6) | |
|---|---|
| Competences Expected: C1 | |
| **Topics** | **Learning Outcomes** |
| <ul><li>Central Tendency (Mean, median, mode)</li><li>Dispersion (Range, standard deviation, quartile)</li><li>Graphics: histogram, boxplot, etc.: Communication ability.</li></ul> | <ul><li>Use central tendency measures and dispersion measures to describe the data gathered.</li><li>Use graphics to communicate the characteristics of the data gathered.</li></ul> |
| **Readings :** [MRo14], [Men14] | |

| Unit 3: Inferential Statistics (6) | |
|---|---|
| Competences Expected: CS2 | |
| **Topics** | **Learning Outcomes** |
| <ul><li>Determination of the sample size</li><li>Confidence interval</li><li>Type I and type II error</li><li>Distribution type</li><li>Hypothesis test (t-student, means, proportions and ANOVA)</li><li>Relationships between variables: correlation, regression.</li></ul> | <ul><li>Propose questions and hypotheses of interest.</li><li>Analyze the data gathered using different statistical tools to answer questions of interest.</li><li>Draw conclusions based on the analysis performed.</li></ul> |
| **Readings :** [MRo14], [Men14] | |

## 9. WORKPLAN

### 9.1 Methodology

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

### 9.2 Theory Sessions

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

### 9.3 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.

## 10. EVALUATION SYSTEM

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

## 11. 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.