Universidad Nacional Mayor de San Marcos
School of Computer Science
Syllabus of Course
Academic Period 2018-II

1. **Code and Name:** IN0054. Statistics and Probabilities (Mandatory)
2. **Credits:** 4
3. **Hours of theory and Lab:** 3 HT; 2 HL; (15 weeks)
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) **Prerrequisites:** EG0003. Mathematics I. (1st Sem)

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

   (d) **Modality:** Face to face

7. **Specific goals of the Course**

   - 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.$\Rightarrow$ **Outcome a**

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

10. **List of topics**

    1. Variable Type

    2. Descriptive Statistics

    3. Inferential Statistics

11. Methodology and Evaluation
Methodology:

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

Lab Sessions:
In order to verify their competences, several activities including active learning and roleplay will be developed during lab sessions.

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**
- 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.	Variable Type: Continuous, discrete
Readings : [MRo14], [Men14]	

Unit 2: Descriptive Statistics (6)	
Competences Expected: C1	
Learning Outcomes	**Topics**
- Use central tendency measures and dispersion measures to describe the data gathered. - Use graphics to communicate the characteristics of the data gathered.	- 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**
- 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.	- 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]	