

## SUBJECT SYLLABUS

Degree				Academic year
<b>144.2 BACHELOR'S DEGREE IN COMPUTER ENGINEERING</b>				<b>2012/13</b>
Subject code and title				Duration
<b>44210 Statistics</b>				<b>Semester 1</b>
Type	Language	UD Credits	ECTS Credits	Group/Language
<b>BASIC TRAINING</b>	<b>SPA-ENG</b>	<b>6</b>	<b>6</b>	<b>01 / Spanish</b>
Lecturer				
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### DESCRIPTION

The statistics course provides a very important tool for improving the quality of a service or product and for modelling physical phenomena and behaviours. Statistics forms part of a set of courses designed to give students a solid scientific base for studying other material in the course. At the same time, it is vitally important to the engineer since it provides the basic knowledge for analysing and extracting information from a set of data. It allows phenomena subject to variations to be understood and predicted efficiently.

### PREREQUISITES

The competences and mathematical knowledge given in the algebra and calculus courses.

### LEARNING OUTCOMES IN TERMS OF GENERIC AND SPECIFIC COMPETENCES

#### Specific competences

- ¿ CE 1. Identify situations with random behaviour and calculate the probabilities of random phenomena.
- ¿ CE 2. Know, identify and classify random variables from various sources of information.
- ¿ CE 3. Identify and solve problems in which the variable under study follows a known probability distribution. Prepare and build suitable statistical models for real problems and their validation.
- ¿ CE 4. Know the use of estimating and inference on the population being studied to study the behaviour of a population model through a sample taken from the population.
- ¿ CE5. Assess the importance of statistics and of its proper use in specific engineering problems.

#### Generic competences

- ¿ TIME MANAGEMENT: Distribute time in a weighted manner according to priorities, taking into account personal objectives over the short, medium and long terms and the personal and professional areas that are of interest to develop.
- ¿ Domain level 2: Define and sort objectives and plan individual activity over the medium and long terms (from various weeks to half a year).

### CONTENTS

#### Subject 1. Probability axiom.

The concept of probability. Experiences and events. Theory of sets. Interpretations of probability. Probability axioms.

#### Subject 2. Calculation of probabilities.

Study of simple probabilities. Independent events. Conditioned probability. Probability theorem. Total. Bayes's theorem.

#### Subject 3. Single dimension random variable.

Concept of single dimension random variable. Discrete random variables. Continuous random variables. Uniform distribution. Distribution function.

#### Subject 4. Single dimension random variable function.

Single dimension random variable function. Transformed distribution.

#### Subject 5. Moments of single dimension random variable.

Measurements of position. Measurements of dispersion. Markov's and Chebychev's inequalities.

#### Subject 6. Discrete variable models.

Bernoulli's distribution. Binomial distribution. Geometric distribution. Negative binomial distribution. Hypergeometric distribution. Poisson's distribution.

#### Subject 7. Continuous variable models.

Normal general distribution. Central limit theorem.

#### Subject 8. Introduction to inference statistics. Sampling theory.

Sampling and population. Types of sampling. Concept of statistics. Sample distributions. Distribution of average sample. Distribution of corrected sample variation. Statistics and distributions used in comparing normal groups.

Subject 9. Estimating of parameters.

Classical theory of estimating of parameters. Estimating of parameters by confidence interval.

Subject 10. Comparison of hypothesis.

Comparison of parametric hypothesis. Classification of hypotheses. Hypothesis comparison method. Standard errors. Unilateral and bilateral tests. Comparison stages. Comparisons related to averages. Comparisons related to variations. Comparisons related to proportions.

### TEACHING-LEARNING STRATEGY

¿ Classroom activities (69 hours):

- Lectures explaining the theoretical material: 40 hours
- Resolution of exercises and example problems: 23 hours.
- Continuous assessment: 3 hours.
- Final assessment: 3 hours.

¿ Out-of-class activities (81 hours):

- Individual study of lecture material: 32 hours.
- Undertaking of proposed exercises and revision: 20 hours.
- Undertaking of intermediate mileposts and final presentation: 11 hours
- Preparation for exam: 18 hours.

### ASSESSMENT SYSTEM

- Exercises deliverables at the end of each topic, accounting for 15% of the final grade.
- Make a short presentation of the subject that represents 10% of the final grade.
- Three continuous assessment tests consisting of medium difficulty exercises, conducted in class time during term time, and involving (the sum of the three) 75% of the final grade. Passing these tests is not necessary to take the final exam, but it is important to emphasize that the value of these three tests is only 75% of the final grade. Approve the three tests of continuous assessment, jointly or separately, does not guarantee therefore that reaches 50% of the final grade.
- If you get 50% of points with the sum of the deliverables exercises, continuous assessment tests and presentation need not be the final exam. The rating will be obtained so far.
- Final review of the course consisting of four / five problems of medium difficulty, which accounts for 75% of the final grade.

### BIBLIOGRAPHY

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