

DOI-GITT-222 Statistics I

SEMESTER: Spring
CREDITS: 6 ECTS (4 hrs. per week)
LANGUAGE: Spanish
DEGREES: GITT

Course overview

This course focuses on the basic principles of statistics and probability, as well as on their application to solve real problems. In particular, the course starts introducing systematic techniques for analyzing data and estimating probabilities. Next, statistical models are studied in order to deal with uncertainty. Finally, based on previous concepts, main statistical inference methods are studied.

Prerequisites

Basic knowledge of Calculus and Algebra is required (understand and manipulate equations, manipulate exponents and logarithms using their basic rules, full understanding of functions and inverse functions, understand limits, derivatives and integrals, know rules for product and summation, etc).

Course contents

Theory:

1. Descriptive Statistics and Data Analysis.
2. Elements of Probability.
3. Discrete Probability Models.
4. Continuous Probability Models. Stochastic processes.
5. Sampling.
6. Statistical Inference. Point and Confidence Interval Estimation.
7. Statistical Inference. Hypothesis Testing.
8. Probability distribution fitting. Random number generation.

Textbook

- **Montgomery, D.C. and Runger, G.C.** (2010). *Probability and Statistics Applied to Engineering*. Fifth Edition. Wiley. New York.
- **Peebles, P.** (2000). *Probability, Random Variables, and Random Signal Principles*. Fourth Edition. McGraw-Hill.

Grading

The following conditions must be accomplished to pass the course:

- A minimum overall grade of at least 5 over 10.
- A minimum grade in the final exam of 4 over 10.

The overall grade is obtained as follows:

- Final exam accounts for 50% of the final grade if the grade in this exam is at least 4. In other case, final exam accounts for 100 % of the overall grade.
- Other exams accounts for 35%. Typically there is 1 mid-term exam (2-hour long) and 2 additional short exams (1-hour long). They are weighted according to their duration. Mid-term exam accounts for 20%, whereas short exams accounts for 15% in total.
- Practical assignment account for 15% of the final grade.