



COURSE PRESENTATION FORM – ACADEMIC YEAR 2010/2011

COURSE NAME	Laboratory in Statistics
COURSE CODE	72020 (MSc 270)
LECTURER	Enrico Di Bella
TEACHING ASSISTANTS	--
TEACHING LANGUAGE	English
CREDIT POINTS	4
LECTURE HOURS	24
EXERCISE HOURS	12
TIME SPAN	27.09.2010 - 21.01.2011
TIME TABLE	See Timetable Page
OFFICE HOURS LECTURER	During the lecture time, Friday, 9:00-10:30, Faculty of CS, POS Building, piazza Domenicani 3 , office 2.10
OFFICE HOURS TEACHING ASSISTANT	--
PREREQUISITES	Basic concepts of Descriptive Statistics, Probability Theory and Inference.
OBJECTIVES	To learn how to correctly use statistical tools appropriate for various research designs and data types.
SYLLABUS	<ul style="list-style-type: none">• Probability: Sample space, events and probability; rules of Probability; Conditional Probability; Independence.• Discrete random variables and their distributions.• Continuous Distributions: Probability Density, Families of Continuous distributions, Central Limit Theorem.• Computer simulations and Monte Carlo Methods.• Stochastic Processes: Definition and Classifications; Markov processes and Markov Chains; Counting processes; Simulation of stochastic processes.• Queuing Systems.• Statistical Inference: Parameter estimation; Confidence Intervals; Hypotheses testing.• Introduction to Linear Models.• Statistical Inference and Normality assumptions.• Goodness-of-fit tests: Normality Tests• Maximum likelihood.



- **Introduction to non parametric statistics:** bootstrap, permutation tests, Wilcoxon rank sum test, Wilcoxon Signed Rank Test, Kruskal-Wallis Test.

TEACHING FORMAT

Lectures plus exercises in laboratory.

ASSESSMENT

This course is graded Pass/Fail.

A Pass grade requires a positive evaluation of a final written exam. The written exam will consist of 4 exercises and 4 theoretical questions.

READING LIST

Textbooks:

- Baron M., Probability and Statistics for Computer Scientists, Chapman and Hall. (all the chapters)
- Moore D.S., McCabe G. P., Introduction to the practice of Statistics, fifth edition, W. H. Freeman & C. (Chapters 14 and 15 only)

SOFTWARE USED

- Excel

LEARNING OUTCOME

Awareness of the key role of the assumptions made in order to correctly analyze data.
Development of the critical spirit needed to select the most adequate methodology to analyze a given data-set.
Development of self-sufficiency for the study of other advanced statistical topics.

COURSE PAGE

[CASE-Teaching](#)