COURSE DESCRIPTION – ACADEMIC YEAR 2017/2018

Course title	**Statistical Methods**
Course code	72127
Scientific sector	MAT/06
Degree	Master in Computer Science (LM-18)
Semester	1
Year	1
Credits	4
Modular	No

Total lecturing hours	24
Total lab hours	--
Total exercise hours	12
Attendance	Not compulsory
Prerequisites	Basic mathematical skills.
Course page	None. Students should refer to their notes taken during lectures and exercise classes, and consult the suggested textbook and readings.

Specific educational objectives	The course belongs to the type "affini o integrative – formazione affine". Specific educational objectives are theoretical and applied knowledge of descriptive and inferential statistics for applications in computer science.

Lecturer	Leonardo Ricci
Contact	Piazza Domenicani 3, Room 1.04, Leonardo.Ricci@unibz.it and leonardo.ricci@unibz.it
Scientific sector of lecturer	FIS/01
Teaching language	English
Office hours	During the lecture time span: Tuesday, 12.45-13:45
Lecturing Assistant (if any)	--
Contact LA	--
Office hours LA	--
List of topics	• Discrete random variables and their distributions: probability; random variables; probability distributions; expected values. • Statistical Inference: tests of significance and p-values; Bayes' theorem; a short account on decision-making. • Correlation and regression. • Time series analysis: basic smoothing techniques (averaging methods, exponential smoothing techniques); short account on more advanced fitting techniques. • Dynamic systems and Markov chains: Markov processes, states, transition probabilities and matrices; remarkable applications.
Teaching format	Frontal lectures and project work during the exercise hours.

Learning outcomes	Knowledge and understanding:

	• Thoroughly understand the scientific method of investigation. • Understand methods of mathematics and of statistics that support Information Technology and its applications. Applying knowledge and understanding: • Be able to design and execute experimental analyses on information systems or their components. Making judgments • Be able to work autonomously according to the own level of knowledge Communication skills • Be able to structure and write scientific documentation. Learning skills • Have developed learning capabilities to pursue further studies with a high degree of autonomy. • Be able to learn the innovative features of state-of-the-art technologies and information systems

Assessment	Written final exam only [100 % of mark]. The exam consists of 4-6 exercises.
Assessment language	English
Evaluation criteria and criteria for awarding marks	Correctness of answers / calculations.

Required readings	1. D. Freedman, R. Pisani, R. Purves, "Statistics" (International student edition, 4th edition), W.W. Norton & Company, 2007; 2. I. Miller, M. Miller, "John E. Freund's Mathematical Statistics with Applications" (7th Edition), Pearson; 3. M. Baron, "Probability and Statistics for Computer Scientists" (1st edition), Chapman and Hall/CRC, 2006.
Supplementary readings	--
Software used	--