# Course Description – Academic Year 2016/2017

**Course title** | Statistical Methods  
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**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**
2. I. Miller, M. Miller, "John E. Freund's Mathematical Statistics with Applications" (7th Edition), Pearson;

**Supplementary readings**
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**Software used**
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