# Syllabus

## *Course Description*

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| **Course Title** | Statistics for TSE |
| **Course Code** | 30171 |
| **Course Title Additional** | |
| **Scientific-Disciplinary Sector** | STAT-01/A |
| **Language** | Italian |
| **Degree Course** | Bachelor in Tourism, Sport and Event Management |
| **Other Degree Courses (Loaned)** | |
| **Lecturers** | Prof. Alessandro Casa,<br>Alessandro.Casa@unibz.it<br>https://www.unibz.it/en/faculties/economics-management/academic-staff/person/46549 |
| **Teaching Assistant** | |
| **Semester** | First semester |
| **Course Year/s** | 2 |
| **CP** | 6 |
| **Teaching Hours** | 36 |
| **Lab Hours** | 18 |
| **Individual Study Hours** | - |
| **Planned Office Hours** | 18 |
| **Contents Summary** | The course introduces students to the fundamental concepts of descriptive and inferential statistics, with a particular focus on applications in economics and social sciences. Methods for synthesising and interpreting data, the basics of probability theory, sampling and the main inferential techniques, such as point and interval estimation, hypothesis testing and simple linear regression, are covered. Students will develop the ability to analyse real datasets and draw conclusions, effectively applying basic statistical tools. Some concepts of statistical software are introduced to support data analysis. |

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| **Course Topics** | - Descriptive statistics: basic definitions, classification of variables, overview of sampling techniques, frequency distributions, graphical representations, measures of central tendency and variability.<br><br>- Probability: introduction to probability, basic axioms, conditional probability, independence, Bayes' theorem, introduction to discrete and continuous random variables, expected values and variance, introduction to known distributions for discrete and continuous random variables, central limit theorem.<br><br>- Inference: Sample statistics and sample distributions, introduction to estimators and their properties, point estimation, interval estimation (mean, proportion, difference between means, paired samples), hypothesis testing (mean, proportion, difference between means, paired samples)<br><br>- Additional topics: analysis of bivariate dependencies between variables using correlation and regression, introduction to R software for descriptive analysis, statistical inference and regression. |
| **Keywords** | probability, inference, hypothesis testing, confidence intervals, descriptive statistics |
| **Recommended Prerequisites** | There are no formal prerequisites; however, attendance of the Mathematics for Economists course is strongly encouraged. |
| **Propaedeutic Courses** | |
| **Teaching Format** | Lectures and exercises. |
| **Mandatory Attendance** | - |
| **Specific Educational Objectives and Learning Outcomes** | ILO (Intended Learning Outcomes)<br><br>ILO 1 - Knowledge and understanding<br>ILO 1.1. of descriptive statistics and how to summarise data: variables, frequency distributions, measures of central tendency and variability.<br>ILO 1.2. of the concept of uncertainty and the basic elements of probability theory.<br>ILO 1.3. of the basic concepts of sampling theory.<br>ILO 1.4. of the basic concepts of inferential statistics: point estimation; confidence intervals; hypothesis testing; linear |

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| | regression.<br>ILO 1.5. of the relationships between variables and the basic concepts in hypothesis testing.<br>ILO 1.6. Statistical terminology<br>ILO 1.7. Software available for data analysis in the social sciences.<br>ILO 1.8. The basics of the concepts of uncertainty, ambiguity and robustness in the context of data analysis.<br>ILO 1.9. Fundamental methods and algorithms for data analysis, as well as machine learning methods.<br><br>ILO 2 - Ability to apply knowledge and understanding<br>ILO 2.1. basic concepts useful for following courses in economics, business and administration<br>ILO 2.2. economic problems with multiple variables in a formalised way; ability to identify (optimal) solutions and interpret the results based on existing theories.<br>ILO 2.3. defining economic problems in a formalised manner; finding (optimal) solutions and interpreting results based on existing theories.<br>ILO 2.4. using mathematical tools for the analysis of static and dynamic models.<br>ILO 2.5. mathematical problems and models and ideas for solving them.<br>ILO 2.6. Use mathematical tools to analyse static and dynamic models with multiple variables.<br>ILO 2.7. Statistical methods as useful research tools in the social sciences.<br>ILO 2.8. Descriptive and inferential statistics to synthesise information, analyse and interpret relationships between variables, and test hypotheses.<br>ILO 2.9. At least one statistical application to develop a simple data analysis.<br>ILO 2.10. Understanding the basic principles of modern data analysis concepts, e.g. machine learning.<br><br>ILO 3 - Independent judgement<br>ILO 3.1. Identifying the most relevant variables to use when making decisions in complex situations;<br>ILO 3.2. Report analytically and critically on information, empirical evidence and data in order to make appropriate economic and |

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| | managerial decisions.<br>ILO 3.3. Evaluate the most appropriate quantitative and qualitative analysis tools to assist the decision-making process.<br>ILO 3.4. Use logical arguments and relate information and analytical tools to find solutions.<br><br>ILO 4 - Independent judgement (Communication skills)<br>ILO 4.1. Graduates of the degree course in Tourism, Sport and Event Management will develop communication and presentation skills to explain, argue and summarise, in a professional context, the complex interdisciplinary issues of the tourism, sport and events sector.<br>ILO 4.2. The achievement of this objective will be assessed through written exams, individual and group assignments, and the final degree thesis.<br><br>ILO 5 - Learning skills<br>ILO 5.1. ability to analyse, critically evaluate and integrate data, information and experiences;<br>ILO 5.2. ability to develop possible solutions to economic and management problems in the operational contexts relevant to the employment opportunities of graduates. |
| **Specific Educational Objectives and Learning Outcomes (additional info.)** | |
| **Assessment** | Assessment (for attending and non-attending students): - Mid-term written examination (optional): Covers approximately half of the course topics. Contributes 40-50% to the final mark, depending on the content (ILOs 1, 2, 3, 4, 5).<br>- Final written exam: Covers the remaining topics if the midterm exam was taken (50-60% of the final mark), or the entire course if the midterm exam was not taken (100% of the final mark) (ILOs 1, 2, 3, 4, 5).<br>Note: the midterm exam mark will remain valid for one year. |
| **Evaluation Criteria** | Both the mid-term and final written examinations consist of theoretical questions and exercises. They will be assessed on the basis of clarity of presentation, knowledge and understanding of statistical methods, ability to apply appropriate statistical procedures, and correctness of results. The ability to read and |

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| | interpret R results will be essential for solving some exercises. |
| **Required Readings** | Moore, S. D., Basic Statistics, Apogeo 2nd Edition, ISBN-10 8850331975<br><br>Lecture notes and exercises will be provided. |
| **Supplementary Readings** | Borra, S., Di Ciaccio, A. (2008). Statistics. Methodologies for economic and social sciences. McGraw-Hill. Statistical analysis of data with R. Apogeo. Pasetti, P. (2002). Tourism Statistics. Carocci. |
| **Further Information** | |
| **Sustainable Development Goals (SDGs)** | Good health and well-being, Climate action, Reduced inequalities, Affordable and clean energy |