Libera Università Internazionale
degli Studi Sociali Guido Carli

LUISS

Syllabus

Academic Year	2021/2022
Program	Politics: Philosophy and Economics
Course	Statistics
Term	I semester
Year	1
SSD	SECS-S/01 - Statistica
Credits	8

INSTRUCTIONAL GOALS	The main aim of the course is to endow students with basic statistical tools for collecting and analysing univariate and bivariate data for political, economic and social sciences applications. Descriptive statistics provide methods for data explorative analysis. Probability theory provides models for phenomena which are subject to uncertainty. Statistical inference provides methods for analysing data obtained from random experiments. Practical lessons dealing with real-world examples are designed to allow students to improve abilities in collecting, analysing, interpreting and presenting findings and data also using statistical software and advanced spreadsheet (EXCEL). The EU digital competences DIGCOMP 2.1 are developed (Competence area 1: information and data literacy; Competence area 2: communication and collaboration; Competence area 3: digital content creation).
INTENDED LEARNING OUTCOMES They describe what a learner is expected to know, understand and be able to demonstrate after completion of a learning path.	**Knowledge and understanding**: Knowledge of data types and related univariate analysis techniques (frequency distributions, graphical representations, central tendency and dispersion measures), Probability theory, Statistical inference, association in two way tables, linear regression. **Applying knowledge and understanding**: Ability to select appropriate data analysis methods analyze the relationship between variables in economics, finance and business. **Making judgements**: Ability to collect, use and critically interpret quantitative and qualitative data relating to economics and social sciences, achieved through the analysis of documents issued by official national and international statistics, scientific articles on statistical methods and applications, case studies. Digital competences are developed.

	Communications Skills: Effective communication skills of data analysis works - achieved through written tests and the presentation of research results on empirical data.s **Learning skills**: Ability to learn autonomously data analysis techniques, in professional activities or subsequent studies, achieved through the analysis of statistical methods applied in economics and social sciences
Pre-requisites	None.
Course content	Theoretical lessons: Statistical variables. Frequency distributions. Data Graphical representations. Measures of position. Variability. Random experiment and events. Probability axioms and theorems. Conditional probability. Independence. Univariate and bivariate random variables, discrete and continue random variables. Probability distributions. Central limit theorem. Introduction to random sampling. Point Estimation. Interval Estimation. Statistical hypothesis testing. Correlation. Practical lessons dealing with real-world examples in social sciences.
Reference Books	Authors: Alan Agresti / Christine A. Franklin / Bernhard Klingenberg. Title: “Statistics: The Art and Science of Learning from Data” Global Edition, Pearson, Edition 4 Additional text-book (English and Italian version available) Authors: G. Cicchitelli, P. D'Urso, M. Minozzo. Title: "Statistica: principi e metodi" III Ed. con MyLab – Pearson Seeing Theory: https://seeing-theory.brown.edu.
Teaching Methods	Lectures, exercises, applied exercises, interactive visualization, case studies in social sciences based on real data, also using statistical and econometric packages and advanced spreadsheet.
Assessment	The final examination is the in the form of a written test consisting of both theoretical and empirical questions, and a project work on real data. DEVELOPED SKILLS with the Project Work: Making Judgments, Digital competences (1, 2, 3), work in group, respect of time, problem solving. WRITTEN EXAMINATION: this type of examination ("scritto verbalizzante") consists in a written test without a subsequent oral examination. The student must book for the written test. At the end of the final examination, the teacher corrects the homework and publishes the results on the dedicated VOL web page (within one week from the end of the written examination). The students enrolled in the final exam will receive a communication with the results of the final examination (the outcomes of the written examination will also be displayed on the web self service). Since the publication of the results, the student has 3 days to reject the grade. Once the 3-day period is elapsed, the rule of "tacit consent" applies and the examination result is verbalized by the teacher. The teacher has to close down the verbal through the digital signature. Once the verbal is closed down, the student receives an e-mail communication reporting the mark obtained. The text of the final proof and the corresponding solution are made available on the class website before the publication of the results.

Each candidate can access the solution of the written exam in a way that, independently from the final outcome of the exam, the student will be on time so to be able to reject the proposed vote.

An intermediate written assessment will be held in the week 19-24 October. In the case the written assessment is passed and the student accepts the corresponding vote, then the final examination will only consist of the subjects concerning the second half of the course.

The final grade of the written assignment is computed as the arithmetic average of the marks obtained in the two tests.

Students attending the course are requested to solve 1 problem set (in groups of three students) on real data based on material already taught at home using advanced spreadsheet (EXCEL) and to hand to the teacher by a due date. Each problem set will be graded out of 1 point. The final assessment of the exam is obtained by adding to the grade on the final exam the grade on the problem set (0, 1 points), for the sustained exam - any result - of the first session.