Bachelor Degree in Business Administration (L-18)

Statistics

a.y. 2023-2024, 2nd year, 2nd semester, 6 ECTS Credits

Prof. Francesco Rania

Course Information	Statistics (SECS-S/01) 6 ECTS – 42 hours Lesson period: 2nd year, 2nd semester 6 ECTS, a.y. 2023-2024
Professor Information	Prof. Francesco Rania Department of Law, Economy and Sociology Website: https://www.diges.unicz.it/web/docenti/rania-francesco/ Email: raniaf@unicz.it Phone: +39 0961 3694 4987 Office hours: during the lesson period; before and after the lessons and every month before the examination
Course Description	The course aims to provide mathematical, probabilistic and statistical tools in order to perform social and economic investigations.
Course goals and Expected Learning Outcomes	Upon course completion, a student will be able to: • Know and apply the tools of the theory of descriptive statistics, of probability and inferential statistics.; • Understand and use the basic techniques to measure, represent and analyze a quantitative variable; • Estimate the statistics of the population through a sample; • Built confidence intervals and check hypothesis test of statistics; • Make a simple quantitative analysis.
Program	• Elements of univariate descriptive statistics: frequency tables, graphical summaries (plots), summary statistics (mean, mode, median and quantiles), variability indexes (variance, standard deviation, coefficient of variation). • Elements of bivariate descriptive statistics: contingency table, statistical independence and chi-square index for association. Covariance and correlation coefficient, regression line and goodness of fit. Pearson and Spearman indices. • Elements of probability: definition of probability, probability theorems, independent events, conditional probability, law of total probability, Bayes' theorem. • Random variables: definition, probability distribution, density function, cumulative distribution, expected value and variance. • Examples of random variable: Bernoulli, Binomial, Geometric, Poisson, Uniform, Normal, T-Student, Chi-square, Fisher, Log-normal. • Linear combination of random variables and central limit theorem. • Sampling and distribution of samples. • Elements of point estimate statistics: sample mean, sample variance, sample proportion and their properties. • Confidence intervals: general theory confidence intervals for the mean, the difference of means, the proportion, the variance, the ratio of variances. • Hypothesis testing: general theory and hypothesis test for the mean, the difference of means, the proportion, the variance, the ratio of variances. Non-parametric test: independence test and goodness test.
Expected student workload	Approximately 90 hours.

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<tr><td>Teaching methods</td><td>- Lectures
- Case studies
- Exercises during the classroom lessons</td></tr>
<tr><td>Learning resources (textbooks, eventual further reading, …)</td><td><u>Textbook</u>
- F. Rania, Appunti di Statistica, Cacucci Editore 2010.

<u>Further reading</u>
- D. Piccolo, Statistica, terza edizione il Mulino Strumenti 2010.</td></tr>
<tr><td>Support activities</td><td>Subject-specific seminars</td></tr>
<tr><td>Attendances policy</td><td>The attendancy policy is established by art. 8 of the University teaching regulation: http://www.unicz.it/pdf/regolamento_didattico_ateneo_dr681.pdf.</td></tr>
<tr><td>Assessment Methods</td><td>The course includes intermediate assessment tests for attending students. Passing these tests requires a score of 14/30 or higher.
The examination is written and oral. The student must have obtained a score of 14/30 in the written part to be able to sit for the final (oral) part.
<table>
<tr><th>Grade</th><th>Grade knowledge and understanding of the topic</th><th>Ability to analyze and synthesize</th><th>Use of references</th></tr>
<tr><td>Fail</td><td>Severe shortcomings and inaccuracies</td><td>Irrelevant frequent generalizations. Inability to synthetize</td><td>Completely inappropriate</td></tr>
<tr><td>18-20</td><td>Sufficient. Important shortcomings.</td><td>Sufficient capabilities</td><td>Sufficient</td></tr>
<tr><td>21-23</td><td>Basic knowledge</td><td>The student is capable of correct analysis and synthesis, he argues logically and consistently</td><td>The student uses standard references</td></tr>
<tr><td>24-26</td><td>Satisfactory. Good knowledge</td><td>The student has good analysis and synthesis skills. The arguments are expressed consistently</td><td>The student uses standard references</td></tr>
<tr><td>27-29</td><td>Very good</td><td>The student has considerable skills in analysis and synthesis</td><td>The student studies in depth the topics of the exam</td></tr>
<tr><td>30-30L</td><td>Excellent</td><td>The student has Excellent analysis and synthesis skills</td><td>Important insights</td></tr>
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