UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Psicologiche, Pedagogiche, dell'Esercizio Fisico e della Formazione
ACADEMIC YEAR	2024/2025
BACHELOR'S DEGREE (BSC)	PSYCHOLOGICAL SCIENCES AND TECHNIQUES
SUBJECT	SOCIAL STATISTICS
TYPE OF EDUCATIONAL ACTIVITY	C
AMBIT	10687-Attività formative affini o integrative
CODE	06702
SCIENTIFIC SECTOR(S)	SECS-S/05
HEAD PROFESSOR(S)	PARROCO ANNA MARIA Professore Ordinario Univ. di PALERMO MENDOLA DARIA Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	8
INDIVIDUAL STUDY (Hrs)	146
COURSE ACTIVITY (Hrs)	54
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	2
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**MENDOLA DARIA** Tuesday 10:00 11:00 Ricevimento Online su piattaforma Teams (codice di accesso 5u94trz). Occorre *sempre* prenotarsi tramite portale unipa Thursday 09:30 10:30 Dipartimento SPPEFF (campus di viale delle scienze, Palermo), edificio 15, piano 6, stanza P6 010. Occorre *sempre* prenotare almeno 2 gg prima tramite piattaforma. **PARROCO ANNA MARIA** Tuesday 09:00 12:30 Il ricevimento si svolge in presenza presso lo studio 610, al 6 piano dell'ed.15 oppure a distanza su piattaforma TEAMS. Dopo essersi prenotati, si prega di inviare una mail all'indirizzo annamaria.parroco@unipa.it specificando la modalita prescelta e per concordare un appuntamento orario.

PREREQUISITES	Prerequisites ensure that you will have the necessary academic background for a course. Students are required to have basic notions of mathematics at the high school level. Particularly: order relations, equivalence relations; natural, rational, real numbers and their properties. Then, absolute value, exponentiation, power; dealing with negative and positive numbers. The notion of a mathematical function. The orthogonal Cartesian reference system, the linear function: geometric meaning of slope and intercept. These prerequisites are acquired autonomously by each student or via the attendance of the first-year courses in "BASIC SKILLS FOR QUANTITATIVE ANALYSIS" and "BASIC INFORMATICS". Students must take a self-evaluation test on the course's first day to verify whether they meet the prerequisites. Students lacking the required competencies will be provided with a textbook to fill in their gaps.
LEARNING OUTCOMES	DUBLIN DESCRIPTORS: * Knowledge and understanding: Knowledge and understanding of the basic models and techniques of statistics. * Applying knowledge and understanding: Acquirement of theoretical and methodological skills to support the analysis of psychological contexts. * Making judgements: Acquirement of the capacity to work independently, with a discerning and aware approach, demonstrating to have got the ability to organize the knowledge learned in order to autonomously choose the best actions and solutions according to different situations. *Communication: Acquirement of skills to describe and summarize statistical data and the results of statistical analysis. Acquirement of technical statistical lexicon. Acquirement of the ability to express statement of problems in a formal language (mathematical/statistical). *Lifelong learning skills: Achieving an expertise in autonomous learning. Achieving good ability to apply knowledge to solve concrete prospective problems.
ASSESSMENT METHODS	ASSESSMENT METHODS: Written and oral tests. The written test is in the Italian language and is a multiple-choice test that includes 20 empirical exercises that need a spreadsheet (Excel, Calc or similar ones). It will be aimed at assessing acquisitions reached during the course and, in particular, the ability to apply knowledge and understanding, independence of judgment and communication skills. The written test takes about one hour. Any right answer is given a score of 1.5. Only right answers are scored positively, while a penalty of 0.5 is given to any incorrect answers. Missing answers do not contribute to the final grade. Grades are expressed out of thirty. The pass mark is reached whether the students got a mark of at least 16/30. Answering correctly to all questions allows for gaining the maximum score (30/30). The oral examination is an interview aiming at assessing the acquirement of skills, technical language proficiency and knowledge provided by the course. Candidates have to answer at least two/three questions posed orally, covering bivariate statistics and statistical inference. The final assessment aims to evaluate whether students have knowledge and understanding of the topics as well as whether they acquired the capacity to interpret and independently judge real case studies. The pass mark has been reached when students show knowledge and understanding of the subjects at least in general terms and have the minimal application of knowledge regarding the presentation of case studies. In addition, students have to demonstrate presentation and argumentative skills to allow the transmission of their knowledge to the examiner. Below this threshold, the examination will be insufficient. Grades of the oral exam are expressed in thirtieths. The final assessment is the average of written and oral grades. Erasmus students will be given the same test as local students (i.e., in Italian). However, they can choose to give the oral exam in Italian or English. No additional marks are in this case granted according to the language chosen. ONLY FOR STUDENTS WHO DECIDE TO TAKE THE MID-COURSE TEST: During the week of suspension of didactic activity, a mid-course test is administered to students who freely decide to participate. It is a multiple-choice test that includes 8 questions consisting in exercises via using a spreadsheet (Excel, Calc or similar ones). It refers to topics imparted up to that time of the

	course (descriptive statistics and probability). The allotted time is 25 minutes. Any right answer is given a score of 1.5. Only right answers are scored positively, while a penalty of 0.5 is given to any incorrect answers. Missing answers do not contribute to the final grade. Grades are expressed out of thirty. To get the minimum evaluation and pass the mid-term test, the candidate must got at least a mark of 16/30. The student who passes the mid-course test will be able to take the final written test on the contents of the program that are not part of the first test, as long as this takes place within the first useful exam session (the one immediately following the end of the course). Whether students are not satisfied with the mark received, they can renounce and answer the complete (full) test. The final evaluation is calculated as the average of the marks obtained in the written / practical tests and the oral one (with weights given by: mid-term and end of course test 50%, oral test 50%). Compensatory tools and dispensatory measures will be guaranteed by the Disability and Neurodiversity Center - University of Palermo (Ce.N.Dis.) to students with disabilities and neurodiversity, based on specific needs and in implementation of current legislation.
EDUCATIONAL OBJECTIVES	The course addresses the basic instruments and notions of Social Statistics. This course considers both theoretical and methodological aspects as well as practical ones.
TEACHING METHODS	Theoretical-practical lessons with the personal computer. Excel (or Calc) labs. Every lesson is made up by both theoretical notions and practice. Students are requested to bring with them their own devices in order to participate in lab activities. To share study materials and for some lab activities we use the e-learning platform, provided by the University of Palermo.
SUGGESTED BIBLIOGRAPHY	(Uno a scelta/ choose one among these) a) Mecatti F. Statistica di base. Come, quando, perche'. McGraw-Hill (terza edizione, 2022) b) Agresti A., Franklin C., Statistica. L'arte e la scienza di imparare dai dati. Pearson, 2016. (qualunque edizione). ISBN: 9788865189511 c) Borra S., Di Ciaccio A., Statistica, metodologie per le scienze economiche e sociali, McGraw-Hill, 2008 (qualunque edizione). EAN: 9788838696329

SYLLABUS

Hrs	Frontal teaching
2	Quantitative methods in social science: an introduction
1	Statistical unit, population and variable
3	Taxonomy of variables. Variables x cases framework. Statistical data sources. Frequencies distribution.
3	Grouped frequency distributions. Graphics of frequency distributions.
2	Mode, percentiles, arithmetic mean and their properties
1	The shape of a distribution. Skewness. Box-plot.
3	Statistical variability: range, interquartile interval; standard deviation; variance: coefficient of variation. Their property and interpretation.
2	Elements of probability.
2	Random variables. The normal and t di Student distributions.
2	Population and parameters. Probabilistic and non probabilistic sampling. Basic concept of classical inference.
3	Estimators and their properties (unbiasedness, efficiency, consistency). Sampling distributions. Point estimate , standard error. Confidence intervals.
2	Point estimation of the mean, the proportion and the variance. Confidence intervals for the mean and the proportion
5	Hypothesis testing; p-value, significance level; type I and type II error.
2	Two-way tables: construciton and interpretation. Frequencies and percentual (row/column) frequencies.
1	Introduction to the study of variables relationship
2	Relationship between categorical variables. X square index. The V Index
4	Statistical relations between quantitative variables: scatterplot, covariance, linear correlation and regression.

Hrs	Practice
7	Using spreadsheets for preparing, manipulating and analysing data: simple and bivariate statistics
7	Tutorials on probability and inference.

PREREQUISITES	Prerequisites ensure that you will have the necessary academic background for a course. Students are required to have basic notions of mathematics at the high school level. Particularly: order relations, equivalence relations; natural, rational, real numbers and their properties. Then, absolute value, exponentiation, power; dealing with negative and positive numbers. The notion of a mathematical function. The orthogonal Cartesian reference system; the linear function: the geometric meaning of slope and intercept. T Basic command on Excel (or similar spreadsheet). These prerequisites are acquired autonomously by each student or via the attendance of the first-year courses "BASIC SKILLS FOR QUANTITATIVE ANALYSIS" and "ALFABETIZZAZIONE INFORMATICA". Students must take a self-evaluation test on the course's first day to verify whether they meet the prerequisites. To those students lacking the required competencies, study materials will be suggested to help them to fill in their gaps.
LEARNING OUTCOMES	DUBLIN DESCRIPTORS: * Knowledge and understanding: Knowledge and understanding of the basic models and techniques of statistics. * Applying knowledge and understanding: Acquirement of theoretical and methodological skills to support the analysis of psychological contexts. * Making judgements: Acquirement of the capacity to work independently, with a discerning and aware approach, demonstrating to have got the ability to organise the knowledge learned to autonomously choose the best actions and solutions according to different situations. *Communication: Acquirement of skills to describe and draw information from statistical data and the results of statistical analysis. Acquirement of technical statistical lexicon. Acquirement of the ability to express statements of problems in a formal language (mathematical/statistical). *Lifelong learning skills: Achieving an expertise in autonomous learning. Achieving a good ability to apply knowledge to solve concrete prospective problems.
ASSESSMENT METHODS	ASSESSMENT METHODS: Written and oral tests. The written test is in the Italian language and is a multiple-choice test that includes 20 empirical exercises that need a spreadsheet (Excel, Calc or similar ones). The written test aims to assess student's acquisitions reached during the course and, in particular, the ability to apply knowledge and understanding, independence of judgment and communication skills. The written test takes about one hour. Any right answer is given a score of 1.5. Only right answers are scored positively, while a penalty of 0.5 is given to each incorrect answers. Missing answers do not contribute to the final grade. Grades are expressed out of thirty. The pass mark is reached whether the students got a mark of at least 16/30. Answering correctly to all questions allows for gaining the maximum score (30/30). The oral examination is an interview aiming at assessing the acquirement of skills, technical language proficiency and knowledge provided by the course. Candidates are required to answer at least two/three questions posed orally, covering bivariate statistics and statistical inference. The final assessment aims to evaluate whether students know and understand the topics as well as whether they acquired the capacity to interpret and independently judge real case studies. The pass mark has been reached when students show knowledge and understanding of the subjects at least in general terms and have the minimal application of knowledge regarding the presentation of case studies. In addition, students have to demonstrate presentation and argumentative skills to allow the transmission of their knowledge to the examiner. Below this threshold, the examination will be insufficient. Grades of the oral exam are expressed in thirtieths. The final assessment is the average of written and oral grades. ONLY FOR STUDENTS WHO DECIDE TO TAKE THE MID-COURSE TEST: During the week of suspension of didactic activity, a mid-course test is administered to students who freely decide to participate. It is a multiple-choice test that includes 8 questions consisting of exercises via using a spreadsheet (Excel, Calc or similar ones). It refers to topics imparted up to that time of the course (usually, descriptive statistics and probability). The allotted time is 25 minutes. Each right answer is scored 1.5 points. Only right answers are scored positively, while a penalty of 0.5 is given to each incorrect answer. Missing answers do not contribute to the final grade. Grades are expressed out of thirty. To get the minimum evaluation and pass the mid-term test, the candidate must get at least a mark of 16/30. The student who passes the mid-course test will be able to take the final written

	test on the contents of the program that are not part of the first test, as long as this takes place within the first useful exam session (the one immediately following the end of the course).
	Whether students are not satisfied with the mark received, they can renounce and answer the complete (full) test.
	The final evaluation is calculated as the average of the marks obtained in the written / practical tests and the oral one (with weights given by: mid-term and end-of-course test 50%, oral test 50%).
	** Erasmus students will be given the same test as local students (i.e., in Italian). However, they can freely opt to take the oral exam in Italian or English. No additional marks are in this case granted according to the language chosen.
	** Compensatory tools and dispensatory measures will be guaranteed by the Disability and Neurodiversity Center - University of Palermo (Ce.N.Dis.) to students with disabilities and neurodiversity, based on specific needs and in implementation of current legislation.
EDUCATIONAL OBJECTIVES	The course addresses the basic instruments and notions of Social Statistics. This course considers both theoretical and methodological aspects as well as practical ones. It is aimed to develop methods of scientific quantitative analyses in psychology.
TEACHING METHODS	TEACHING METHODS -Theoretical-practical lessons with the use of a personal computer or tablet. Excel (or Calc) labs.
	Every lesson is made up by both theoretical notions and practice.
	Students are requested to bring their own devices to participate in lab activities. Alternatively, study material will be suggested to acquire autonomously these competencies.
SUGGESTED BIBLIOGRAPHY	(Uno a scelta tra i seguenti)
	a) Mecatti F. Statistica di base. Come, quando, perche'. McGraw-Hill (terza edizione, 2022) - disponibile anche per il prestito online su Biblioteche UNIPA-
	b) Agresti A., Franklin C., Statistica. L'arte e la scienza di imparare dai dati. Pearson, 2016. (qualunque edizione). ISBN: 9788865189511
	c) Borra S., Di Ciaccio A., Statistica, metodologie per le scienze economiche e sociali, McGraw-Hill, 2008 (qualunque edizione). EAN: 9788838696329
	Per la condivisione del materiale didattico e di alcune attivita' laboratoriali si utilizzera' il portale di Unipa dedicato all'insegnamento di Statistica Sociale.
	E' fortemente sconsigliato lo studio su appunti, dispense o altri materiali diversi da quelli forniti dalla docente.

SYLLABUS

Hrs	Frontal teaching
2	Quantitative methods in psychological sciences: an introduction. Quantifying in social sciences: measurement scales.
2	2. Population, statistical units, variables. Measurement, scales (ordinal and non-ordinal scales, interval scales, ratio scales)
3	3. Data Matrix: variables x cases framework. Frequency distributions (simple and in classes). Plotting your data (pie charts, Histograms, column charts, cartograms).
4	3b. Using spreadsheets for preparing, manipulating and analysing data. Pivot tables and graphs in Excel
2	4. Mean values: mode, median, quantiles, arithmetic mean. Use and properties.
2	5. Statistical variability: range, interquartile interval; standard deviation; variance: coefficient of variation
2	6. Graphs: pie chart, Histogram, column chart, The shape of a distribution. Skewness. Box-plot.
2	7. Introduction to probability, main theorems. Population and its parameters. A brief introduction to probability sampling schemes.
4	8. Discrete and continuous random variables. Gaussian (Normal) distribution; Student t distribution. Using Excel to find percentiles and probabilities of Gaussian and Student distribution.
2	9. Population and its parameters. Introduction to statistical inference and sample estimation. Estimators and their properties (unbiasedness, efficiency and consistency)
8	10. Estimators and their properties (unbiasedness, efficiency, consistency). Sampling distributions. Point estimate, standard error. Confidence intervals.
3	10b. Using Excel to produce confidence intervals for the means and the proportion.
5	11. Hypothesis testing in statistics. Type I and type II errors. The statistical test; p-value and significance level. Procedure to test an hypothesis on the mean or on the the proportion of the population
3	11b. Using Excel to test a statistical hypothesis
6	12. Introduction to bivariate statistics: existence, intensity, link's direction and functional form of the relationship between two variables. Statistical relations between quantitative variables: scatterplot, covariance, linear correlation and regression model. Theoretical basis and Excel Labs.

SYLLABUS

Hrs	Frontal teaching
2	13. Two-way tables: construction and interpretation. Absolute and relative frequencies, conditional (row/ column) frequencies.
2	14. Relationship between categorical variables. Chi-squared index. The Cramer V Index