



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Psicologiche, Pedagogiche, dell'Esercizio Fisico e della Formazione		
ACADEMIC YEAR	2015/2016		
MASTER'S DEGREE (MSC)	SOCIAL, OCCUPATIONAL AND ORGANISATION PSYCHOLOGY		
SUBJECT	DATA ANALYSIS LABORATORY		
TYPE OF EDUCATIONAL ACTIVITY	C		
AMBIT	20969-Attività formative affini o integrative		
CODE	17940		
SCIENTIFIC SECTOR(S)	SECS-S/05		
HEAD PROFESSOR(S)	FERRANTE MAURO	Professore Associato	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	6		
INDIVIDUAL STUDY (Hrs)	110		
COURSE ACTIVITY (Hrs)	40		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	FERRANTE MAURO Wednesday 10:00 12:00 Stanza del docente: edificio 15, sesto piano, stanza 608, oppure su Piattaforma Microsoft Teams. E' preferibile che gli studenti interessati contattino il docente tramite mail qualche giorno prima per essere aggiunti al team del ricevimento.		

DOCENTE: Prof. MAURO FERRANTE

PREREQUISITES	
LEARNING OUTCOMES	<p>Conoscenza e capacità di comprensione (Knowledge and understanding) We expect that students will strengthen their ability in understanding and they will be able to write critically elaborate texts which will include the use of statistical techniques for analyzing mass behaviours and attitudes. Such techniques are in fact largely used in evaluation processes within communities and all other contexts where psychologists work.</p> <p>Capacità di applicare conoscenza e comprensione (Applying knowledge and understanding) Psychologists are expected to critically use statistics within their work environment. We refer, for example, to the observation of the behaviour of individuals and groups within families and institutions; to the prevention of hardships and to the facilitation of wellness at work and in society, and to the evaluation of related policies; to the personnel selection, training and evaluation for both public and private organizations.</p> <p>Autonomia di giudizio (Making judgements) The course is designed for the achievement of this ability. All the phases of the research path are analyzed, so that students can acquire the expertise necessary to critically select, among many data analysis tools, the more suitable to the nature of the investigated phenomena.</p> <p>Abilità comunicative (Communication skills) At the end of the course, students are expected to be able to interpret and communicate the results of their work, both as research results and in any other format. In order to do that, students have to reinforce the elements of their statistical language, and to acquire the capabilities required to produce scientific and professional reports.</p> <p>Capacità d'apprendimento (Learning skills) Critical thinking and the selection of the most suitable research designs (among many possible options) represent the most relevant purposes of this course. People able to do this, can also develop the ability to learn by themselves in further steps of their academic and professional career.</p>
ASSESSMENT METHODS	Open book PC session.
EDUCATIONAL OBJECTIVES	<p>This course offers students the chance to think about some fundamental issues related to the research methodology and to data analysis, with a particular focus on direct applications.</p> <p>The main purpose of the course consists of orientating students to the critical use of statistical analysis tools for producing research reports. Case-studies, obtained from the psychological field, will be used in order to explain the close connection among the researcher's questions, the choice of one among many research designs and statistical tools. Applications will be encouraged through the LibreOffice Calc and RStudio and R softwares.</p>
TEACHING METHODS	The course will be held in English through lectures and practical lessons.
SUGGESTED BIBLIOGRAPHY	<p>Review of Statistics (concepts and methods). All academic books on descriptive and inferential statistics used by students during their BA degree courses fit the requirements of this course; some additional papers and/or online resources will be suggested by the teacher to interested students.</p> <p>Data analysis using LibreOffice Calc. Manual downloadable from: https://www.libreoffice.org/get-help/documentation/</p> <p>Data analysis using R and RStudio: Materials distributed to students during lessons.</p> <p>An excellent elective resource, useful also for professional use of the software, is: Dalgaard P. (2008), Introductory statistics with R, Springer, http://www.springer.com/us/book/9780387790534</p>

SYLLABUS

Hrs	Frontal teaching
2	Review of descriptive statistics: univariate analysis
2	The analysis of the relationship between variables. Causation and covariation.
3	Review of inferential statistics: estimating parameters, testing hypotheses
Hrs	Practice
2	Introduction to LibreOffice Calc.
4	Introduction to R and RStudio.

Hrs	Workshops
7	Univariate descriptive statistics: mean, median, quantiles, mode; standard deviation, variance, coefficient of variation, Gini's heterogeneity index. From data matrices to frequency distributions: cumulative and non-cumulative frequency distributions (discrete values and classes, counts, relative frequencies, percentages). Graphs: bar plot, pie chart, histogram, vertical lines plot, stair step plot, ogive. The shape of a distribution: right-skewed, left-skewed, bell-shaped; boxplot.
8	Bivariate descriptive statistics, the linear regression model. Crosstabulations: counts, row, column and total percentages. Distributions for qualitative and discrete or continuous quantitative variables. Stacked bar plot, scatter diagram. Chi-square, Cramer's V, Spearman's rho, covariance, linear correlation. The regression line: slope and intercept. The coefficient of determination.
10	Probability and statistical inference. Theoretical continuous distributions: Normal distribution, Student's t distribution, Chi-square distribution, Fisher-Snedecor's distribution. Probabilities, densities, percentiles. Sampling distributions: expected value (EV), standard error. Point estimates, confidence intervals: for the population mean, the population proportion, the population variance. Hypotheses testing: about a population mean, about a population proportion (large samples), about two population means (matched-pairs data, independent samples, equal or unequal population variances), about two population proportions (matched-pairs data, independent samples), about more than two population proportions. The Chi-square test for independence. Testing for other statistical relations: Spearman's rho, Pearson's linear correlation index, and regression slope. Non-parametric tests: Kolmogorov-Smirnov, Mann-Whitney, Wilcoxon. Interpreting the software output.
2	Self-evaluation test.