



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Scienze Psicologiche, Pedagogiche, dell'Esercizio Fisico e della Formazione		
<b>ACADEMIC YEAR</b>	2018/2019		
<b>MASTER'S DEGREE (MSC)</b>	SOCIAL, OCCUPATIONAL AND ORGANISATION PSYCHOLOGY		
<b>SUBJECT</b>	DATA ANALYSIS LABORATORY		
<b>TYPE OF EDUCATIONAL ACTIVITY</b>	C		
<b>AMBIT</b>	20969-Attività formative affini o integrative		
<b>CODE</b>	17940		
<b>SCIENTIFIC SECTOR(S)</b>	SECS-S/05		
<b>HEAD PROFESSOR(S)</b>	FERRANTE MAURO	Professore Associato	Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>			
<b>CREDITS</b>	6		
<b>INDIVIDUAL STUDY (Hrs)</b>	110		
<b>COURSE ACTIVITY (Hrs)</b>	40		
<b>PROPAEDEUTICAL SUBJECTS</b>			
<b>MUTUALIZATION</b>			
<b>YEAR</b>	1		
<b>TERM (SEMESTER)</b>	2° semester		
<b>ATTENDANCE</b>	Not mandatory		
<b>EVALUATION</b>	Out of 30		
<b>TEACHER OFFICE HOURS</b>	<b>FERRANTE MAURO</b> 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

<b>PREREQUISITES</b>	Students are expected to have knowledge on basic statistical concepts, acquired during the three-year degree.
<b>LEARNING OUTCOMES</b>	<p>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>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>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>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>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>
<b>ASSESSMENT METHODS</b>	<p>Open book PC session. Assessment Methods: Excellent - 30/30 cum laude - Excellent knowledge of course topics and of statistical language, the student is able in applying the acquired knowledge for solving the proposed problems.</p> <p>Very good - 26/29 - Good Knowledge of course topics, Very good knowledge of statistical language; the Student can apply the acquired knowledge for solving the proposed problems.</p> <p>Good - 24/25 - Basic knowledge of course topics, Discreet knowledge of statistical language, with a certain capability in the application of acquired knowledge for solving the proposed problems.</p> <p>Acceptable - 21/23 - Minimum knowledge of main course topics. Acceptable knowledge of statistical language. Minimum capability in the application of acquired knowledge for solving the proposed problems.</p> <p>Sufficient - 18/20 - Minimum knowledge of main course topics. Acceptable knowledge of statistical language. Low or no capability in the application of acquired knowledge for solving the proposed problems.</p> <p>Inadequate - Student doesn't have the minimum knowledge of the main contents of the course topics.</p>
<b>EDUCATIONAL OBJECTIVES</b>	<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 RStudio and R softwares.</p>
<b>TEACHING METHODS</b>	The course will be held in English through lectures and practical lessons.
<b>SUGGESTED BIBLIOGRAPHY</b>	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.

Navarro, D. (2015) Learning Statistics with R: A tutorial for psychology students and other beginners (ver. 0.5). A free copy of the book can be downloaded at the following link: <https://health.adelaide.edu.au/psychology/ccs/docs/lsr/lsr-0.5.pdf>  
Materials distributed to students during lessons.

## 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
2	Introduction to R and R studio
Hrs	Practice
2	Self-evaluation test
Hrs	Workshops
4	Importing dataset, inputting data; Basic R functions
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 noncumulative 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: rightskewed, left-skewed, bell-shaped; boxplot.
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 noncumulative 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: rightskewed, 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, FisherSnedecor'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.