UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Biomedicina, Neuroscienze e Diagnostica avanzata
ACADEMIC YEAR	2023/2024
MASTER'S DEGREE (MSC)	MEDICINE AND SURGERY
SUBJECT	MEDICAL STATISTICS
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50405-Inglese scientifico e abilità linguistiche, informatiche e relazionali, pedagogia medica, tecnologie avanzate e a distanza di informazione e comunicazione
CODE	06692
SCIENTIFIC SECTOR(S)	MED/01
HEAD PROFESSOR(S)	MATRANGA DOMENICA Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	90
COURSE ACTIVITY (Hrs)	60
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	2
TERM (SEMESTER)	2° semester
ATTENDANCE	Mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**MATRANGA DOMENICA** Friday 12:00 13:30 Stanza della docente, Dipartimento di Promozione della Salute, Materno-Infantile, Medicina interna e specialistica di eccellenza "G. D'Alessandro", Via del Vespro, 133, piano terra

PREREQUISITES	The student must have the skills and knowledges required to overcome the admission test.
LEARNING OUTCOMES	Knowledge and ability to understand At the end of the course, students will need to demonstrate: • knowledge and ability to understand both observational and experimental study design; • knowledge and ability to understand descriptive statistics, probability and assessment of diagnostic tests accuracy; • knowledge and ability to understand statistical tests and confidence intervals of one mean, one frequency, two means, two frequencies, one variance, two variances; • knowledge and ability to understand the sample size calculation; • knowledge and ability to understand the epidemiological and frequency measurements in health-care setting; • knowledge and ability to understand the R software for statistical analysis Ability to apply knowledge and understanding At the end of the course, students will be able to read and interpret critically the most relevant scientific literature in the clinical and epidemiologic field, they will have analytical, synthesis and argument ability, and critical and connecting capabilities, related to treated issues. Students will be able to execute autonomously simple statistical analyses of data from clinical or epidemiologic studies and will be able to calculate the correct sample size. They will be able to use the R software for statistical analysis. Making judgements At the end of the course, students will be able to judge autonomously the correctness of study design and statistical analysis related to the research question. Communication skills Students will be able to communicate the results of a clinical or epidemiological study using the specific language of medical statistics. Learning capacity Students will build their ability to keep themselves up-to-date by reading the most important scientific national and international publications, which use rigorous statistical methods. They will gain a wealth of knowledge that they could use to attend profitably post-graduate education courses.
ASSESSMENT METHODS	The assessment test of Medical Statistics consists of 1 statistical analysis using R and 2/3 oral questions about theory that aim to evaluate the "knowledge" and the "know-how" acquired by the student, about all topics included in the programme, with regards to the suggested references and the materials provided by the teacher. The test aims to assess if the student has knowledge and comprehension of the topics, autonomy of judgement, capacity of application of the acquired skills, specific language of the subject. Statistical analysis using R will be requested during an assessment interim test, with assessment "Satisfactory/Unsatisfactory". Length of the interim test: 30-60 minutes. In case of "Satisfactory" assessment, the oral exam will consider only theoretical questions. Assessment criteria The assessment is carried out of thirty. The pass mark will be reached when the student shows knowledge and understanding of the subject at least in general terms; furthermore, the student will also have to show presentation and argumentative skills as to allow the transmission of his/her knowledge to the examiner. Below this threshold, the examination will be insufficient. The more, however, the student will be able to find own connections between the topics of the course and be able to go into detail about discipline, the more the assessment is positive. The assessment is done according to the following scheme: A – A+ (Excellent)=30-30 cum laude=Excellent knowledge of teaching contents; students should show high analytical and synthetic capabilities and should be able to apply their knowledge to solve highly complex problems. B (Very good)=27-29=Very good knowledge of the teaching contents and excellent language control; students should show analytical and synthetic skills and be able to apply their knowledge to solve problems of medium and, in some cases, even higher complexity. C (Good)=24- 26=Good knowledge of teaching contents and good language control; the students should be able to apply their knowledge to solve problems of medium complexity D (Satisfactory)=21-23=Average knowledge of the teaching contents, in some cases limited to the main topic; acceptable ability to use the specific discipline language and independently apply the acquired knowledge. E (Sufficient)=18-20=Minimum teaching content knowledge, often limited to the main topic; modest ability to use the subject specific language and independently apply the acquired knowledge. F (Fail)=1-17=Lack of an acceptable knowledge of the main teaching content knowledge; very little or no ability to use the specific subject language and apply independently the acquired

	knowledge.
EDUCATIONAL OBJECTIVES	The course aims to introduce the basic concepts of statistical methodology with application to the clinical and epidemiological context. The training course is aimed at the knowledge and comprehension of basic concepts of descriptive and inferential statistics, of observational and experimental study design, and of epidemiologic measures of frequency and risk of diseases. Students will be able to execute and interpret simple statistical analyses, also by using the R software.
TEACHING METHODS	Teaching is based on lectures and practice, also with informatics aid and supported by slides, downloadable by the unipa website
SUGGESTED BIBLIOGRAPHY	Bland M., Statistica Medica, II Edizione, Maggioli Editore, ISBN 978-88-916-2973-9 Altri Libri consigliati 1. Daniel W.W., Cross C.L., Biostatistica, III Edizione EdiSES, ISBN 978-88-3319-041-9 2.Triola MM Triola MF Roy F, Fondamenti di statistica per le discipline biomediche, 2022 Pearson Italia. ISBN 97888891915443 3. Bacchieri A., Della Cioppa G. Fondamenti di ricerca clinica, Springer. ISBN 88-470-0211-7

SYLLABUS

Hrs	Frontal teaching
7	Descriptive statistics: Definitions, Variable Classifications. Data synthesis through tables, graphics. Measures of central tendency and variability.
7	Probability calculus. Bayes Theorem. Measures of accuracy of screening tests.
15	Inferential statistics: Statistical sampling. Theoretical distributions for a random variable: Normal Distribution, Binomial Distribution. Central limit theorem. Statistical estimation of mean and frequency, of two means, of two frequencies, of one variance, of two variances. Test of statistical hypothesis on the mean and on the frequency, on two means, on two frequencies, on one variance, on two variances. Sample size calculation for estimation and test of hypothesis
4	Linear Correlation and Regression
5	Observational and experimental studies
4	Epidemiological measures of occurrence and risk of disease. Statistical tests of association.
18	Statistical analysis of data with R