UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Economiche, Aziendali e Statistiche
ACADEMIC YEAR	2019/2020
MASTER'S DEGREE (MSC)	STATISTICS AND DATA SCIENCE
INTEGRATED COURSE	STATISTICAL AND ECONOMIC EVALUATION IN HEALTHCARE - INTEGRATED COURSE
CODE	20616
MODULES	Yes
NUMBER OF MODULES	2
SCIENTIFIC SECTOR(S)	SECS-S/03, SECS-S/05
HEAD PROFESSOR(S)	VASSALLO ERASMO Professore Associato Univ. di PALERMO
OTHER PROFESSOR(S)	VASSALLO ERASMO Professore Associato Univ. di PALERMO GIAMBALVO ORNELLA Professore Ordinario Univ. di PALERMO
CREDITS	9
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	2
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**GIAMBALVO ORNELLA** Tuesday 10:00 12:00 Il servizio prenotazione ricevimento e sospeso. Per fissare un appuntamento con la docente si prega di inviare una mail all'indirizzo ornella.giambalvo@unipa.it Wednesday 12:00 13:00 Il servizio prenotazione ricevimento e sospeso. Per fissare un appuntamento con la docente si prega di inviare una mail all'indirizzo ornella.giambalvo@unipa.it **VASSALLO ERASMO** Monday 14:30 15:30 Ufficio docente o da remoto via Teams Tuesday 14:30 15:30 Ufficio docente o da remoto via Teams

DOCENTE: Prof. ERASMO VASSALLO

PREREQUISITES	The course requires knowledge of statistical inference and statistical modeling, as well as basic principles of the health systems and of the major statistical software such as R or SAS.
LEARNING OUTCOMES	Knowledge and understanding Acquisition: 1. essential tools for analysis of the healthcare market; 2. Proper language of the economic health disciplines; 3. knowledge of the general problems related to clinical trials (limits and opportunities); 4. principles of performance measurement; 5. principles of the cost and production functions in health. Applying knowledge and understanding Be able to: 1. Evaluate the relevant areas for intervention in the public health system; 2. Identify relevant information to assess the degree of effectiveness of a policy; 3. Making elementary analysis on capacity of the health systems to meet the needs of a community; 4. Understanding when it is appropriate / possible to conduct a randomized study and when it is not possible, and knowing limits and possibilities of some methods for bias reduction; 5. Search, extract and comment the statistical data related to evaluation and performance of the health system in a regional, national and international context. Making judgments Recognize the advantages / disadvantages of randomized and non-randomized trials; provide a critical reading of the results obtained through different analysis models. Use proper indices and proper performance indicators in line with the structure of public finances and Regional Public Accounts. Communication skills Know how to expose the characteristics of clinical studies in statistical terms and of the statistical performance; expose results obtained through the economic, social and statistical analysis and to highlight the socio-economic effects of expenditure programs; Summarize and report the main issues on the economic and statistical analysis in health. Learning skills Be able to: critically evaluate, using the knowledge acquired in the course, both the specialist studies that the institutional structure of health systems by comparing different countries. Be able to: consult official reports and statistics from Istat, OECD, Eurostat, etc. and relative scientific publications with analysis of the national and international literature on the health sector and relative performances. Use the knowledge acquired in the course to attend advanced master or specialized seminars.
ASSESSMENT METHODS	Written and oral test for each module. The final mark takes into account both tests. The written exam focuses on practical skills and interpretation about the resolution of a problem usually with the use of a statistical model for time series or cross-section series. The written test takes about an hour and it is structured so that the student can successfully use different strategies and alternatives analysis. In particular, it is required attention to meaning and interpretation of the data and results with the support of statistical software. The oral exam is focused on all the topics of the syllabus and, besides, mathematical and statistical proofs or short exercises can be requested. The oral exam takes about half an hour. The student's assessment takes into account some factors in both written exam and oral exam: knowledge of concepts and subjects, practical use skills, proper use of statistical language. For each of these 3 dimensions is given a rating: absent, poor, adequate, good, excellent. The minimum positive rating (18) is given in the case of sufficient knowledge of the arguments, whereas the maximum rating (30) is attributed to a full and mature knowledge of the arguments. The overall evaluation is a simple mean of the two evaluations for the two modules.
TEACHING METHODS	Lessons in classroom, specific lectures, tutorials, labs and homeworks with wide use of R and/or SAS statistical software and eletronic spreadsheets. Preparation of teaching materials and slides uploaded on the course website.

MODULE
STATISTICAL EVALUATION METHODS IN HEALTHCARE

Prof. ERASMO VASSALLO

SUGGESTED BIBLIOGRAPHY

- Hollingsworth B. e Peacock S.J. (2008) “Efficiency Measurement in Health and Health Care”, Routledge: New York. (Capp. 2, 3 e 4 per gli argomenti introduttivi, concetti e definizioni; capp.5 e 6 per misure di efficienza ed applicazioni)
- Jacobs R., Smith P.C. e Street A. (2009) “Measuring Efficiency in Health Care Analytic Techniques and Health Policy”, Cambridge University Press: Cambridge. (Capp.1 e 2, concetti e definizioni; capp. 3 e 4, modelli di efficienza; capp.5, 6 e 7, approfondimento sui modelli e confronti)

AMBIT	21031-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	108
COURSE ACTIVITY (Hrs)	42

EDUCATIONAL OBJECTIVES OF THE MODULE

The student must attain knowledge and skills useful and necessary to the professional activities involved in measurement and statistical analysis of the characteristics and performance of the healthcare institutions both locally and nationally / internationally. In particular, the student must acquire the statistical tools used and usable by health professionals. In addition, an objective is to acquire the theoretical and practical elements for the search of the statistical data, analysis and interpretation of the statistical information through appropriate indices and indicators in the context of parametric and non-parametric modeling. The student who learns the structure of the main health institutions and the performance evaluation methods should be able to know the main features of these health systems and to have the ability to assess the specific characteristics, highlighting the improvement paths and adaptation to the highest standards.

SYLLABUS

Hrs	Frontal teaching
2	Principles of performance measurement
2	economic and statistical factors of performance in health
4	statistical sources of data for European, national and regional comparisons
2	Production, productivity and efficiency in health
4	parametric and non-parametric models for performance measures
4	univariate and multivariate control charts for quality in healthcare
6	Statistical analysis on real data and implementation of correction policies

Hrs	Practice
4	performance measurement
4	productivity and efficiency
4	control charts
6	Applications with real data and use and comparison of statistical software (R, SAS, GRETL, STATA, etc.)

MODULE
EXPERIMENTAL PLANS AND CLINICAL TRIALS

Prof.ssa ORNELLA GIAMBALVO

SUGGESTED BIBLIOGRAPHY

Meinert C. Clinical Trial , Overview 37-51, voce nel volume Biostatistics in Clinical Trials, Carol K. Redmond (Editor), Theodore Colton (Editor) Wiley.

Machin D, Campbell M. Walters S (2007) Medical Statistics capp 12, 13, 14, 15, Wiley

AMBIT	21031-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	54
COURSE ACTIVITY (Hrs)	21

EDUCATIONAL OBJECTIVES OF THE MODULE

The student must i) know basics of randomised and non-randomised trials, ii) be able to interpret relevant elements of the trial (sample size, study quality, statistical analysis of results), iii) apply some methods devoted to bias in non-randomised studies.

SYLLABUS

Hrs	Frontal teaching
2	Introduction
4	Randomised clinical trials
3	non-randomised clinical trials, and quasi-randomised clinical trials
3	Methos for bias reduction in randomised clinical trials

Hrs	Practice
3	study-case of ransomised clinical trials
3	study-case of non-ransomised clinical trials
3	propensity score