UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT			
ACADEMIC YEAR			
ANNO ACCADEMICO EROGAZIONE			
SUBJECT			
CODE			
SCIENTIFIC SECTOR(S)			
HEAD PROFESSOR(S)	CRACOLICI MARIA FRANCESCA	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	CRACOLICI MARIA FRANCESCA	Professore Ordinario	Univ. di PALERMO
	GIAMBALVO ORNELLA	Professore Ordinario	Univ. di PALERMO
CREDITS			
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR			
TERM (SEMESTER)			
ATTENDANCE			
EVALUATION			
TEACHER OFFICE HOURS	**CRACOLICI MARIA FRANCESCA** Monday 15:00 16:30 Online attraverso piattaforma Teams **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		

DOCENTE: Prof.ssa MARIA FRANCESCA CRACOLICI

PREREQUISITES	Basic concepts of Statistics and Business Economics.
LEARNING OUTCOMES	Knowledge and Understanding: a) to identify suitable data and surveys for exploring the economic and social context; b) to identify suitable statistical methods to analyze economic and social phenomena. Applying knowledge and understanding: a) To describe and to explore economic and social phenomena; b) to apply statistical methods for analyzing economic and social issues. Critical thinking: a) to interpret, in plain language, the application and outcomes of statistical techniques; b) to interpret computer output and use it to solve problems. Communicative skills: a) to illustrate and discuss, in plain language, the results of empirical analyses; b) to comment critically on the appropriateness of the methods used. Learning skills: a) to complete and apply the knowledge of statistics and applied statistics learnt in undergraduate courses; b) to enrich such knowledge by the reading of scientific papers on statistics methods for economic and social phenomena.
ASSESSMENT METHODS	An oral test is conducted to assess the student's knowledge of the subject and verbal communication skills. The oral exam aims to evaluate the ability of the student: a) to link theory to statistical methods; b) to interpret the application of statistical tools and their implications; c) to discuss empirical outcomes. The exam will be evaluated sufficient if the student shows a basic knowledge of the subject, and good verbal communication and analytic skills.
TEACHING METHODS	The course uses lectures and practical classes. The lectures provide an overview of the course content. The practical classes will comprise discussion, problem solving activities, group work, student questions and student participation. Students are expected to have done the required reading before the practical.

MODULE
STATISTICS FOR ECONOMIC AND BUSINESS ANALYSIS

Prof.ssa MARIA FRANCESCA CRACOLICI

SUGGESTED BIBLIOGRAPHY

Biggeri L., Bini M., Coli A., Grassini L., Maltagliati M. (2017). Statistica per le decisioni aziendali. Pearson: Torino (Capp. 1, 2, 5 e pp. 8.1-8.4).
Bracalente B., Cossignani M., Mulas A. (2009). Statistica aziendale. McGraw- Hill: Milano (Cap. 6).
Appunti del docente e articoli scientifici.

AMBIT	84543-Discipline Statistico-applicate
INDIVIDUAL STUDY (Hrs)	108
COURSE ACTIVITY (Hrs)	42

EDUCATIONAL OBJECTIVES OF THE MODULE

The course aims to provide students with a sound understanding of theoretical statistical principles as well as advanced practical skills in the application of statistics in order to support managers in the decision making process.
The student will be able to:
-identify suitable data and surveys for exploring the economic and business context;
-identify suitable statistical methods that support business decision making.
-explore the macro context where firms operate and to examine the economic performance of firms;
-apply statistical methods for supporting managers in the decision making process.
-interpret computer output and use it to solve problems.
-evaluate implications of a decision-making choice.

SYLLABUS

Hrs	Frontal teaching
2	Introduction to Business and Economic Statistics: essential concepts and definitions. Business Information System.
10	Data collection in economic and business statistics. Financial Ratios: Uses and limitations. Statistical analysis of financial ratios. Quantitative Benchmarking.
12	Technical performance measures: productivity and efficiency. Definitions and measures of efficiency. The Econometric approach to efficiency measurement. The mathematical programming approach to efficiency. measurement.

Hrs	Practice
9	Statistical analysis of economic and annual financial statements data.
9	The measurement of productivity and efficiency.

MODULE
STATISTICAL METHODS FOR CONSTRUCTING INDICATORS

Prof.ssa ORNELLA GIAMBALVO

SUGGESTED BIBLIOGRAPHY

- Nardo M, Saisana M, Saltelli A, Tarantola S, Hoffmann A, Giovannini E. Handbook on Constructing Composite Indicators: Methodology and User Guide. Paris (France): OECD publishing; 2008. JRC47008;
- Becker et al., (2022). COINr: An R package for developing composite indicators. Journal of Open Source Software, 7(78), 4567, https://doi.org/10.21105/joss.04567
- F. Aiello, M.Attanasio (2004), How to transform a batch of simple indicators to make up a unique one?, Atti della XLII Riunione Scientifica della SIS, Bari, giugno 2004

AMBIT	84543-Discipline Statistico-applicate
INDIVIDUAL STUDY (Hrs)	108
COURSE ACTIVITY (Hrs)	42

EDUCATIONAL OBJECTIVES OF THE MODULE

The primary objective of the course is to acquire statistical skills for the analysis of multidimensional data in the evaluative field. The student will be able to:
- Define a simple indicator and a composite indicator,
- Recognize and understand the utility of a simple indicator or, alternatively, a composite indicator;
- Identify the constituent elements of a composite indicator (most commonly used linear and non-linear transformations and merging function) starting from various simple indicators;
- Understand the advantages/disadvantages of the most common mathematical functions used for the construction of indicators with respect to the type of data and objective;
- Recognize the use (and utility) of indicators in comparative terms over time and space, highlighting the limits and properties.

SYLLABUS

Hrs	Frontal teaching
2	Introduction to the Course: An Overview of Key Definitions; Essential Steps for Constructing Composite Indicators; A introduction to the Theoretical Framework
4	Theoretical framework; data selection; proxy data; data quality; measurement scales
2	Imputation of missing data; missing completely at random; missing at random; not missing at random
4	Imputation techniques; multivariate analysis; PCA; Cronbach Coefficient Alpha
4	Data normalization; Ranking; z-score; min-max normalization; distance to reference; categorical scale normalization; indicators above or below the mean
4	Weighting and aggregation; deal with correlation and weights; budget allocation approach; principal component analysis; data envelopment analysis; benefit of doubt approach; analytic hierarchy process;
2	Additive aggregation methods; linear aggregation; geometric aggregation
2	Uncertainty and sensitivity analysis; steps of the uncertainty analysis; visualisation of the results

Hrs	Practice
2	Application of imputation techniques
4	Application of multivariate analysis techniques; PCA; Cronbach’s Alpha
2	Application of normalization and standardization techniques
4	Application of weighting techniques
2	Application of aggregation techniques
4	Application of uncertainty and sensitivity analysis