UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Economiche, Aziendali e Statistiche
ACADEMIC YEAR	2023/2024
MASTER'S DEGREE (MSC)	ECONOMIC AND FINANCIAL SCIENCES
INTEGRATED COURSE	ECONOMIC ANALYSIS C.I.
CODE	22568
MODULES	Yes
NUMBER OF MODULES	2
SCIENTIFIC SECTOR(S)	SECS-P/01
HEAD PROFESSOR(S)	GIANSANTE SIMONE Ricercatore a tempo determinato Univ. di PALERMO
OTHER PROFESSOR(S)	MAGGIO GIUSEPPE Professore Associato Univ. di PALERMO GIANSANTE SIMONE Ricercatore a tempo determinato Univ. di PALERMO
CREDITS	8
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**GIANSANTE SIMONE** Tuesday 10:00 12:00 dSEAS, primo piano, stanza 105 **MAGGIO GIUSEPPE** Monday 9:00 11:00

DOCENTE: Prof. SIMONE GIANSANTE

PREREQUISITES	Introductory statistics. Students are expected to be familiar with mean, variance, marginal and joint probability; density and cumulative probability distribution function; matrix algebra.
LEARNING OUTCOMES	1) Knowledge and understanding. Students will familiarize with quantitative methods aiming at assessing systemic risk, market risk as well as micro and macro prudential regulation. Moreover, students will familiarise with numerical techniques to estimate systemic risk 2) Applying knowledge and understanding. At the end of the module, students will be able to employ quantitative methods to evaluate risk associated with different levels of aggregation. The students will then obtain the basic skills necessary to provide consultancy regarding quantitative-financial issues. 3) Making judgements. Students will be able to fully understand and critically evaluate financial markets and their structure. The will be able select the appropriate mathematical model to estimate systemic risk. 4. Communication skills. At the end of the module, students will get the necessary skills to write reports analysing the performance and limitation of several pricing techniques. 5. Learning skills. Student will be able to conduct research and analysis in the field of economics and finance using mathematical models.
ASSESSMENT METHODS	Individual or group coursework and final oral exam. The coursework aims at detecting the knowledge and skills possessed by the student. The assignment aims at analysing systemic risk on data and metrics chosen by the unit convenor. The coursework is well-defined and solely interpretable, allowing the student to formulate the answer autonomously and is structured to allow comparison with that provided by other students. The oral exam aims to deepen the written work and to better evaluate the student's learning through an additional question. The sufficiency threshold (equal to a score of 18 on a scale of 18-30) is, overall, obtained on the basis of a weighted average of the written and oral tests (with the weights indicated above). This threshold is reached if the student shows an adequate use of the terms relating to the basic concepts of the course.
TEACHING METHODS	lectures and seminars in person

MODULE
ADVANCED MICROECONOMICS

Prof. GIUSEPPE MAGGIO

SUGGESTED BIBLIOGRAPHY

1) Cunningham, S. (2021). Causal inference: The mixtape. Yale university press.

2) Ravallion, M. (2007). Evaluating anti-poverty programs. Handbook of development economics, 4, 3787-3846.

3) Ravallion, M. (1999). The mystery of the vanishing benefits: Ms Speedy analyst's introduction to evaluation (Vol. 2153). World Bank Publications.

4) Gertler, P. J., Martinez, S., Premand, P., Rawlings, L. B., & Vermeersch, C. M. (2016). Impact evaluation in practice. World Bank Publications.

Altro materiale fornito in classe dal docente.

AMBIT	20979-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	70
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

This module aims to introduce the concept of causal inference starting from quasi-experimental and experimental conditions. The course will pay particular attention to the assumptions and conditions necessary to estimate causal relationships in microeconomics, focusing on the methods recently used in the literature for the estimation of such impacts. Finally, the final part of the module will focus on and apply the techniques discussed in class for the case of impact assessment of projects aimed at economic development, climate resilience and poverty eradication.

SYLLABUS

Hrs	Frontal teaching
2	Introduction: a) what is causal inference? b) Correlation and causality.
8	Causal impact identification approaches: a) matching; b) regression discontinuities; c) instrumental variables; d) Diff-in-Diff; e) Synthetic control
2	Impact assessment: foundations and application to projects aiming at economic development, climate resilience and poverty eradication

Hrs	Practice
14	Applications of causal inference models
4	Application of impact evaluation approaches

MODULE
ADVANCED FINANCE

Prof. SIMONE GIANSANTE

SUGGESTED BIBLIOGRAPHY

1. Černý, A. (2009), Mathematical Techniques in Finance: Tools for Incomplete Markets,2nd ed., Princeton University Press[Chapters1,2,5,6] 2. Paolo Brandimarte: Numerical Methods in Finance and Economics, 2nd ed., Wiley 2006 3. Jim Gatheral: TheVolatility Surface, Wiley 2006[Chapters 7,8] 4. John C. Hull: Options, futures, and other derivatives, 8th ed., Pearson, 2012[Chapter12] 5. Paul Wilmott, Sam Howison and Jeff Dewyne: The Mathematics of Financial Derivatives, Cambridge University Press 1995[Chapters 2,3,10]

AMBIT	20979-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	76
COURSE ACTIVITY (Hrs)	24

EDUCATIONAL OBJECTIVES OF THE MODULE

At the end of the course the student will be able: 1) To evaluate the completeness of a market 2) To exploit arbitrage opportunities 3) To price complex derivative products and implement numerical techniques to evaluate derivative products 4) To distinguish between continuous and discrete pricing

SYLLABUS

Hrs	Frontal teaching
2	Presentation of the objectives of the course. Representation of asset payoffs. Arrow-Debreu securities. Portfolio of assets. Hedging.
2	Representation of returns. Types of arbitrage. Arbitrage Price Theorem. Risk-neutral probabilities
2	Hedging. Arbitrage. Risk-neutral probabilities
2	Pricing in multi-period models. Replicating strategies.
2	Towards continuous-time. IID returns and volatility. Time scaling of mean and variance. Brownian motion. Black–Scholes option pricing formula.
2	Ito's lemma. Deriving Black-Scholes. Beyond Black-Scholes: stochastic volatility and jump-diffusion process
4	Numerical techniques for option pricing
2	Implied volatility. Volatility smile and skew. Volatility indices
2	Numerical technique 1: Binomial Lattice. Calibration, performance and extension to other derivatives
2	Numerical technique 2: Monte-Carlo simulation. Calibration, performance and hedging.
2	Numerical technique 3: Finite differences. Calibration, performance and comparison with other numerical techniques