Academic subject: Econometrics and Portfolio Theory				
Degree Class:LM-40 – Matematica		**Degree Course:** Mathematics	**Academic Year:** 2017/2018	
		Kind of class: Mandatory/Optional depending on the Curriculum	**Year:** 2	**Period:** 1
			ECTS: 7 divided into **ECTS lessons: 6.5** **ECTS exe: 0.5**	
Time management, hours, in–class study hours, out–of–class study hours lesson: 52 exe: 8 in–class study: 60 out–of–class study: 115				
Language: Italian	**Compulsory Attendance:** no			
SubjectTeacher: Nicola Basile (Econometrics) Mario Michele Coclite (Portfolio Theory)	**Tel:** **e–mail:** nicola.basile@dm.uniba.it mariomichele.coclite@uniba.it	**Office:** Department of Mathematics Room 3, II Floor Room 10, II Floor	**Office days and hours:** by appointment	
Prerequisites: Linear Algebra; A First Course of Statistics and Calculus of Probability				
Educational objectives: **Econometrics:** Economic data analysis – Design and estimate of suitable econometric models. **Portfolio Theory:** Analysis of assets protfolios.				
Expected learning outcomes (according to Dublin Descriptors)	**Knowledge and understanding:** 1) Estimate methods and estimator properties. 2) Test design for linear and nonlinear hypotheses. 3) Design of some diagnostic tests. **Applying knowledge and understanding:** Design of a suitable econometric model starting from real or simulated economic data, by using gretl **Making judgements:** Know how to provide theoretical grounds for the employed methodologies. **Communication:** Know how to use a suitable language to describe and solve problems. **Lifelong learning skills:** Operate independently to design models for economic data analysis			

Course program

Econometrics

1. Regression Models
2. The Geometry of Linear Regression
3. The Statistical Properties (finite and asymptotic) of Ordinary Least Square
4. Hypothesis Testing in Linear Regression Models
5. Nonlinear Regression
6. Generalized Least Square
7. Models for Panel Data
8. Autoregressive and Moving-Average Processes
9. Instrumental Variables Estimation

Portfolio theory

1. Introduction. Earnings of a stock and a portfolio. Risk and risk aversion. Selling out. Diversification. Open sale. Set of minimal variance. Efficient portfolios. Efficient frontiers.

2. Risky securities portfolios. Portfolios consisting of two risky titles. Convenience and connection of the possible set of wallets with any number of risky titles. Structure of minimal resource and border boundaries efficiently with any number of risky titles. Portfolio of minimal variance and portfolio of diversification. Efficient border equation.

Portfolio Theorem composed only of risky securities (the theorem of the two funds).

3. Wallets with a non-risky title. Efficient, minimal variance and borderline structure structure with a non-risky title. The theorem of the two funds with a non-risky title (single fund theorem).

4. Capital Asset Pricing Model. Balance of the market. Capital market line. Beta of a portfolio. CAPM and price formula.

Teaching methods:
Lectures and exercise sessions

Auxiliary teaching:

Assessment methods:
Econometrics: Oral exam

Bibliography:
Econometrics

1) R. Davidson – J.G. MacKinnon, Econometric Theory and Methods, Oxford University Press, 2004
2) Lecturer's notes

Portfolio Theory

D. Luenberger, Investimenti e Finanza, Casa Editrice Apogeo, Milano, 2007