UNIVERSITÀ DEGLI STUDI DI PALERMO

DIPARTIMENTO	Scienze Economiche, Aziendali e Statistiche
ANNO ACCADEMICO OFFERTA	2015/2016
ANNO ACCADEMICO EROGAZIONE	2016/2017
CORSO DILAUREA MAGISTRALE	SCIENZE STATISTICHE
INSEGNAMENTO	MODELLI MATEMATICI PER LA GESTIONE DEL RISCHIO
TIPO DI ATTIVITA'	C
AMBITO	21031-Attività formative affini o integrative
CODICE INSEGNAMENTO	18168
SETTORI SCIENTIFICO-DISCIPLINARI	SECS-S/06
DOCENTE RESPONSABILE	CONSIGLIO ANDREA Professore Ordinario Univ. di PALERMO
ALTRI DOCENTI	
CFU	6
NUMERO DI ORE RISERVATE ALLO STUDIO PERSONALE	108
NUMERO DI ORE RISERVATE ALLA DIDATTICA ASSISTITA	42
PROPEDEUTICITA'	
MUTUAZIONI	
ANNO DI CORSO	2
PERIODO DELLE LEZIONI	1° semestre
MODALITA' DI FREQUENZA	Facoltativa
TIPO DI VALUTAZIONE	Voto in trentesimi
ORARIO DI RICEVIMENTO DEGLI STUDENTI	**CONSIGLIO ANDREA** Martedì 12:00 13:00 Edificio 13, I piano, stanza 108; Building 13, I floor, room 108 Giovedì 12:00 13:00 Edificio 13, I piano, stanza 108; Building 13, I floor, room 108

DOCENTE: Prof. ANDREA CONSIGLIO

PREREQUISITI	
RISULTATI DI APPRENDIMENTO ATTESI	INTENDED LEARNING OUTCOMES 1. Knowledge and understanding. Definition of financial risks and measurements. Classification of risk. Comparison of different risk measurement models. 2. Applying knowledge and understanding. Analysis of the risks associated to a given financial product. Extension of the analysis to a simple portfolio of financial products. Formulation of the standard mathematical models to measure the portfolio risk. Implementation in R of the standard risk measurement models. 3. Making judgements. Evaluate the results of a risk model and justify the assumptions made. Explain the implications of wrong assumptions. 4. Communication skills. Outline and report the results using figures and highlight the main modelling assumptions 5. Learning skills. Conduct research and analysis in the field of risk management using mathematical models.
VALUTAZIONE DELL'APPRENDIMENTO	A written examination devoted to the theoretical part of the subject. Part of the written exam consists in writing and run a code in R on risk management issues. The latter is due on a computer. An oral exam to assess the theoretical issues of the subject.
OBIETTIVI FORMATIVI	TEACHING OBJECTIVES At the end of the course the student will be able: 1) To distinguish among the different type of risks 2) To determine the necessary data to estimate risk exposure 3) To write an R code to compute the loss distribution
ORGANIZZAZIONE DELLA DIDATTICA	Lectures and workshops
TESTI CONSIGLIATI	A.J. McNeil, R. Frey, and P. Embrechts. Quantitative Risk Management: Concepts, Techniques and Tools. Princeton University Press, 2015. P Jorion. Value at Risk: The New Benchmark for Managing Financial Risk: Third Edition. McGraw Hill, 2007 T.S. Coleman. Quantitative Risk Management: A Practical Guide to Financial Risk. Wiley, 2012.

PROGRAMMA

ORE	Lezioni
1	Presentation of the objectives of the course
1	Definition of risk and the relation with randomness
2	A taxonomy of financial risk: market risk, credit risk, operational risk.
2	Risk measurement and management. The regulatory framework. The Basel and Solvency II framework.
2	Risk management for a financial firm. Assets, liabilities and balance sheet. Capital.
2	Modelling value and value change. Risk mapping. Valuation methods. Loss distributions.
2	Approaches to risk measurement. Value-at-Risk (VaR). VaR in risk capital calculation.Other risk measures.
2	Stylized facts for univariate and multivariate returns
2	Dimension reduction techniques
2	Introduction to copula and dependencies
2	Market risk: the Var-Cov method, the historical simulation method, the Montecarlo method
2	Credit risk instruments, probability of default, loss given default, exposure at default. Credit risk quality and credit migration
2	The Merton model
2	The Creditmetrics model
2	Operational risk definition. The elementary approach. The advanced approach. The total loss amount and distribution. The dependent case.
2	The compound Poisson. The negative binomial. The moment approximation. The Poisson mixtures, Tails of aggregated loss distributions

ORE	Laboratori
4	Implementing market risk models and backtesting in R
4	Implementing a Credit risk model in R
4	Implementing an operational risk model in R