Master's Degree in Business Administration and Management (LM-77)
Quantitative Methods for Economics and Finance
a.y. 2023-2024, 1st year, 1st semester, 9 ECTS Credits

Prof. Francesco Rania

Course Information	Quantitative Methods for Economics and Finance (SECS-S/06) 9 ECTS – 63 hours Lesson period: 1st year, 1st semester, a.y. 2023-2024
Professor Information	Prof. Francesco Rania Department of Law, Economy and Sociology Website: https://www.diges.unicz.it/web/docenti/rania-francesco/ Email: raniaf@unicz.it Phone: +39 0961 3694 4987 Office hours: during the lesson period; before and after the lessons and every month before the examination
Course Description	Quantitative Methods for Economics and Finance aims to provide mathematical statistical tools and prediction methods, which allow the investigation on economic, financial, and social phenomena.
Course goals and Expected Learning Outcomes	Upon course completion, a student will be able to: • Calculate and interpret confidence interval estimates of population parameters • Formulate and conduct tests of significance for population parameters; • Describe and apply the classical regression model and its application to cross-section data. • Competently use regression, logit and probit analysis to quantify economic relationships using standard regression programmes in simple applications. • Apply regression analysis to fit time-series models with awareness of some of the econometric problems. • Describe and apply the stochastic – geometric processes with awareness of some of the financial problems.
Program	Elements of Statistics: Organization and representation of data; synthetic indicators of central position, variability, skewness, and kurtosis; Statistical ratios; random variables; estimation, tests of hypothesis. Bivariate analysis: cross tables of categorical variables, independence test; the linear regression of a cardinal variable with a single regressor, assumptions, OLS method, regressor estimate and test, model test. Multivariate analysis: linear regression of a cardinal variable with several regressors, OLS method, regressor estimates and tests, model test; logistic regression of a categorical variable, Odds ratio; regression with time effects; the assumptions and standard errors in the regression with fixed effects. Stochastic processes: Gauss, Markov, and Wiener processes. Financial data analysis: prices, returns, shares; Markowitz model; Efficient frontier; Risk aversion; Single index model; Selection of the optimal portfolio in a downside risk context. The event study method: the model; statistical analysis; Multi-title analysis; Application of the event study methodology to a business case. Black-Litterman model: the equilibrium approach, investor view and confidence level, the Bayesian approach, Black-Littermann model. Elements of Social Finance. Integrated risk management: Market risk, Value at risk, Methods to

	compute Var, Credit risk, Credit Metrics method, Credit derivatives, operational risk, operational risk exposure, basic method, standardized method, advanced methods.
Expected student workload	Approximately 150 hours.
Teaching methods	- Lectures - Case studies - Exercises during the classroom lessons
Learning resources (textbooks, eventual further reading, ...)	Textbook - James H. Stock, Mark W. Watson, Introduzione all'econometria, redatto da F. Peracchi, Pearson Addison Wesley (2009 edition or next). - Marco Micocci, Giovanni Battista Masala, Manuale di Matematica Finanziaria Metodi e strumenti quantitativi per il risk management, Carocci editore 2012. Further reading - Hansjoerg Albrecher, Andreas Binder, Volkmar Lautscham, Philipp Mayer, Introduction to Quantitative Methods for Financial Markets, Birkauser Basel Springer 2013. - Gujarati: Basic Econometrics, Fourth Edition McGraw-Hill 2004
Support activities	Subject-specific seminars
Attendancy policy	The attendancy policy is established by art. 8 of the University teaching regulation: http://www.unicz.it/pdf/regolamento_didattico_ateneo_dr681.pdf.
Assesment Methods	The course does not include intermediate assessment tests. The examination is written and oral. The student must have obtained a score of 14/30 in the written part to be able to sit for the final (oral) part.

Grade	Grade knowledge and understanding of the topic	Ability to analyze and synthesize	Use of references
Fail	Severe shortcomings and inaccuracies	Irrelevant frequent generalizations. Inability to synthetize	Completely inappropriate
18-20	Sufficient. Important shortcomings.	Sufficient capabilities	Sufficient
21-23	Basic knowledge	The student is capable of correct analysis and synthesis, he argues logically and consistently	The student uses standard references
24-26	Satisfactory. Good knowledge	The student has good analysis and synthesis skills. The arguments are expressed consistently	The student uses standard references
27-29	Very good	The student has considerable skills in analysis and synthesis	The student studies in depth the topics of the exam
30-30L	Excellent	The student has Excellent analysis and synthesis skills	Important insights