Syllabus

Course Description

Course Title	Financial Engineering and quantitative investment strategies
Course Code	25424
Course Title Additional	
Scientific-Disciplinary Sector	SECS-S/06
Language	English
Degree Course	Master in Accounting and Finance
Other Degree Courses (Loaned)	
Lecturers	Prof. Dr. Peter Alfons Schmid, PeterAlfons.Schmid@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/44766
Teaching Assistant	
Semester	First semester
Course Year/s	2
CP	6
Teaching Hours	36
Lab Hours	-
Individual Study Hours	-
Planned Office Hours	18
Contents Summary	• Purpose: Introduction to a broad array of topics from financial engineering and provision of tools and methodologies for implementing quantitative investment strategies • Main contents: quantitative methods, credit risk transfer, structured products, alternative investments, especially real assets, private equity & hedge funds, active management and investment strategies (theoretical foundations and empirical testing) • Overall: Knowledge and skills to solve real world quantitative finance problems
Course Topics	• Quantitative methods: Review of financial mathematics

	and modelling. • Credit risk transfer: Determination of credit risk and usage of instruments like credit default swaps, total return swaps, asset backed securities, etc. • Structured products: Development and pricing of products - based on equities and fixed income securities - that exhibit specific return, risk or other attributes. • Alternative investments: Fundamentals of the alternative investment space, especially real assets, private equity & hedge funds. Adding value through active management (absolute & relative returns, risk reduction through diversification). • Investment strategies: Theoretical foundation and empirical testing of trend following, and momentum strategies, fixed-income strategies and relative value & event driven strategies
Keywords	credit risk transfer, structured products, alternative investments, investment strategies
Recommended Prerequisites	
Propaedeutic Courses	
Teaching Format	lectures and empirical applications
Mandatory Attendance	Highly recommended
Specific Educational Objectives and Learning Outcomes	Knowledge and understanding: Master's degree graduates should be able to acquire an advanced level of preparation that allows for an articulate and integrated view of the finance issues of companies, financial intermediaries, financial institutions and markets. These learning outcomes are achieved through an advanced knowledge and understanding - of the economic-financial planning and evaluation of new investments; - of the characteristics associated with extraordinary moments in corporate management, such as capital transactions, recourse to financial markets, mergers and acquisitions, corporate crisis and reorganisation; - the problems and techniques of the organisation and financial management of companies and financial intermediaries; - the fundamentals of corporate finance for the correct application of, for example, decision-making models and financial data and risk

	management to treasury management; - the management and economic models of the different types of intermediaries, market microstructure, the operational efficiency of financial markets and the impact of financial markets on the economic conditions of intermediaries; - a wide range of investment, financing and risk management instruments, starting with the fundamentals of portfolio diversification and classical asset pricing and risk measurement models; - the specific finance topics that characterise the profession of financial analyst, portfolio manager, chief financial officer (CFO), chief administrative officer, controller, internal auditor and business consultant. Applying knowledge and understanding: Ability to apply knowledge in the area of Finance to be able to carry out analysis of complex problems in a national and international interdisciplinary context Ability to apply knowledge in the area of Finance for the design and implementation of corporate restructuring and other extraordinary transactions Ability to apply knowledge in the area of Finance for the identification, evaluation and management of investments in financial markets Ability to apply knowledge in the area of Finance for the design of coherent financial management strategies in companies or financial intermediaries, competently applying acquired knowledge in risk management techniques, asset valuation, handling of derivatives Making judgements: Ability to apply acquired knowledge to make managerial and operational decisions and to solve problems in the administration and finance of companies, intermediaries and financial markets, jointly taking into account multiple perspectives of analysis, from economic to legal, financial, strategic, managerial Ability to select data and use appropriate information to describe a problem concerning the management of companies, intermediaries and financial markets. Ability to relate models and empirical evidence in the study of companies, intermediaries and financial markets.

	Communication skills: Ability to communicate effectively in oral and written form the specialised contents of the individual disciplines, using different registers according to the recipients and the communicative and didactic purposes, and to evaluate the formative effects of its communication Learning skills: a) ability to use information technology autonomously to carry out bibliographic research and investigations and for one's own training and updating b) ability to identify thematic links and establish relationships between different cases and contexts of analysis c) ability to frame a new problem systematically and to generate appropriate taxonomies d) ability to develop general models from the phenomena studied.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	Students may opt between two different types of assessment: 1) Standard assessment for the course is an obligatory final written examination (100% of the final grade). 2) Moreover, there is the possibility of an optional assessment, where students write a project paper and have their performance assessed by both the project paper (50% of the final grade) and the obligatory final examination (50% of the final grade). The optional assessment is only available for attending students having notified the lecturer of their choice at the latest on the date of the 9thlecture. The optional course project can be done in groups of 2 students.
Evaluation Criteria	Theoretical knowledge of models and concepts covered in the class as well as knowledge of their empirical applications.
Required Readings	Selected chapters from:

	• Financial Engineering and Computation: Principles, Mathematics, Algorithms by Y.-D. Lyuu, 2002, Cambridge University Press. • Principles of Financial Engineering by R. Kosowski and S.N. Neftci, 2015, Academic Press. • Alternative Investments: CAIA Level I, 4th edition, by D.R. Chambers, M.J.P. Anson, K.H. Black, H.B. Kazemi, 2020, Wiley Finance Editions.
Supplementary Readings	
Further Information	
Sustainable Development Goals (SDGs)	Quality education, Responsible consumption and production, Industry, innovation and infrastructure, Decent work and economic growth