

Syllabus

Course description

Course title	Quantitative Finance
Course code	27205
Scientific sector	SECS-P/11
Degree	Bachelor in Economics and Management
Semester and academic year	2nd semester, ay 2022/2023
Year	Optional
Credits	6
Modular	No

Total lecturing hours	36
Total lab hours	-
Total exercise hours	-
Attendance	Recommended, but not mandatory. The lectures will be recorded and be available in TEAMS in case you cannot attend regularly.
Prerequisites	A basic understanding of statistics is necessary. There are no general prerequisites.
Course page	

Specific educational objectives	<p>The course refers to the complementary educational activities chosen by the student and belongs to the scientific area of Economics.</p> <p>The course provides coverage of important topics in modern Quantitative Finance at the advanced undergraduate level. Special interest is given to asset pricing theory and its empirical applications. Factor models, portfolio theory and option pricing are core elements of the course. All concepts and models are applied in R with real world data. Thus, students learn to implement financial models from start to finish.</p> <p>As a result, students develop the theoretical knowledge and practical skills required for coping with various problems encountered in finance.</p>
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Lecturer	Peter Alfons Schmid e-mail: peteralfons.schmid@unibz.it Tel: 049 176 207 35606 https://www.unibz.it/it/faculties/economics-management/academic-staff/
Scientific sector of the lecturer	SECS-P/09
Teaching language	English
Lecturing assistant	Not foreseen
Teaching assistant	Not foreseen
Office hours	Office hours will be held in TEAMS and in the office. There

	will be 18 office hours in total.
List of topics covered	<p>Theory</p> <ul style="list-style-type: none"> • Risk-Return Trade-Off • Risk measures (Value-at-Risk & Expected Shortfall) • Portfolio Theory • Factor Models (CAPM, Fama & French) • Options (Black Scholes, Binomial option pricing) • Credit risk (Merton model) <p>Applications</p> <ul style="list-style-type: none"> • Introduction to R • Data exploration, estimation and simulation
Teaching format	Lectures and applications in R
Learning outcomes	<p>Knowledge and understanding:</p> <ul style="list-style-type: none"> • Students shall excel at modern finance topics. They are able to use advanced quantitative methods. • Based on the risk-return trade-off students understand asset pricing based on factor models. • Students are able to apply the Black-Scholes-formula and binomial models for option pricing. • Students understand equity as a call option and are able to evaluate credit risk. • Students are able to use the Monte Carlo simulation. <p>Applying knowledge and understanding:</p> <ul style="list-style-type: none"> • Students learn to apply the theoretical concepts and models to real world data. • Therefore, students learn to program in R. The course covers all topics from the import of data to various applications and statistical challenges. <p>Making judgments</p> <ul style="list-style-type: none"> • Students are able to choose the appropriate methods and techniques. • As a result, students are able to make financial decisions under uncertainty. <p>Communication skills</p> <ul style="list-style-type: none"> • Students are able to communicate their financial decisions based on empirical evidence. <p>Learning skills</p> <ul style="list-style-type: none"> • Students understand financial problems and find solutions to these problems. • Students apply analytical reasoning and empirical asset pricing.
Assessment	Closed book written exam: 100%
Assessment language	English
Evaluation criteria and criteria for awarding marks	Theoretical knowledge of models and concepts covered in the class as well as knowledge of their empirical applications.

Required readings	<ul style="list-style-type: none">• Ang, C. S., Analyzing Financial Data and Implementing Financial Models Using R, 2nd edition, Springer, 2021.
Supplementary readings	<ul style="list-style-type: none">• Benninga, S., Financial Modeling, MIT Press, 4th edition, 2014.• Research papers are provided during the course.