Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

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	1st semester, ay 2020/2021
Year	Optional
Credits	6
Modular	No

Total lecturing hours	36
Total lab hours	-
Total exercise hours	-
Attendance	Strongly recommended
Prerequisites	There are no prerequisites. It is advisable, however, that the students attended the course of Financial Analysis in order to properly follow these lectures.
Course page	**https://www.unibz.it/en/faculties/economics-management/bachelor-economics-management/course-offering/**

Specific educational objectives	The course refers to the complementary educational activities chosen by the student and belongs to the scientific area of Economics. 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, fixed income analysis 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. As a result, students develop the theoretical knowledge and practical skills required for coping with various problems encountered in finance.

Lecturer	Peter Schmid **Office hours: Zoom meetings. Fixed office hours via Zoom meetings can be announced.** e-mail: peter.alfons.schmid@outlook.de 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

Office hours	Office hours are scheduled as online meetings.
Lecturing assistant	Not foreseen
Teaching assistant	Not foreseen
Office hours	Not foreseen
List of topics covered	**Theory** • Prices and Returns • Risk-Return Trade-Off • Factor Models • Performance Measures • Portfolio Theory • Bond Valuation • Option Pricing **Applications** • Introduction to R • Data exploration, estimation and simulation • Time series analysis, Cross-sectional analysis
Teaching format	Frontal lectures and applications in R

Learning outcomes	Knowledge and understanding: • 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. The efficient frontier as a result of mean-variance optimization is elaborated. • Students are able to apply methods for bond valuation. Concepts like duration and convexity are discussed. • Students are able to apply the Black-Scholes-formula for option pricing. Applying knowledge and understanding: • 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 in time series and cross-sectional regression. Making judgments • Students are able to choose the appropriate methods and techniques. • As a result, students are able to make investment decisions under uncertainty. Communication skills • Students are able to communicate their investment decisions based on empirical evidence. Learning skills • 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	Relevant for exam assessment: Theoretical knowledge of

criteria for awarding marks	models and concepts covered in the class as well as knowledge of their empirical applications.

Required readings	• Ang, C. S., Analyzing Financial Data and Implementing Financial Models Using R, Springer, 2015. • Benninga, S., Financial Modeling, MIT Press, Fourth Edition, 2014.
Supplementary readings	• Cochrane, J. H., Asset Pricing, Princeton University Press, Revised Edition, 2005.