

## Syllabus

### Course description

<b>Course title</b>	<b>Financial Engineering and quantitative investment strategies</b>
<b>Course code</b>	<b>25424</b>
<b>Scientific sector</b>	SECS-S/06
<b>Degree</b>	LM 77 A&F
<b>Semester</b>	2
<b>Year</b>	2
<b>Credits</b>	6
<b>Modular</b>	No

<b>Total lecturing hours</b>	36
<b>Total lab hours</b>	-
<b>Total exercise hours</b>	-
<b>Attendance</b>	suggested, but not required
<b>Prerequisites</b>	Prior attendance and successful completion of Asset Management and Performance Analysis course (25074) is highly recommended
<b>Course page</b>	<a href="#">TBA</a>

<b>Specific educational objectives</b>	<p>The course refers to the typical educational activities and belongs to the scientific area of Business Administration.</p> <p>The course provides coverage of important topics in modern Financial Engineering and Quantitative Finance at the advanced postgraduate level. Being a subject of truly multidisciplinary field involving financial theory, methods of engineering, tools of mathematics and elements of programming, it attempts to build a coherent picture and detailed understanding of current industry trends and methods used by sophisticated investment market players to earn abnormal returns and hedge risks.</p> <p>The course focuses on Alternative Investments strategies, that target investments in assets other than stocks, bonds and cash or investments using strategies that go beyond traditional ways of investing, such as long/short or arbitrage strategies.</p> <p>The course will enable the students to develop the theoretical knowledge and practical skills required for coping with various problems encountered in modern financial markets.</p> <p>To provide a practice-oriented approach, two thirds of the course material will be delivered by invited industry professionals, who will share their experience on the topic and deliver theoretical material using real world case</p>
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	studies from financial engineering and quants field.
<b>Lecturer</b>	Dmitri Boreiko Office E302 e-mail: <a href="mailto:dmitri.boreiko@unibz.it">dmitri.boreiko@unibz.it</a> Tel: 0471/013277 <a href="http://www.unibz.it/en/economics/people/StaffDetails.html?personid=1070&amp;hstf=1070">http://www.unibz.it/en/economics/people/StaffDetails.html?personid=1070&amp;hstf=1070</a>
<b>Scientific sector of the lecturer</b>	SECS-S/06
<b>Teaching language</b>	English
<b>Office hours</b>	please refer to the lecturer's web page
<b>Lecturing assistant</b>	Not foreseen
<b>Teaching assistant</b>	Not foreseen
<b>Office hours</b>	TBA
<b>List of topics covered</b>	<ul style="list-style-type: none"> <li>• Introduction to alternative investments</li> <li>• Financial mathematics review</li> <li>• Hedge funds industry</li> <li>• Quant models overview</li> <li>• Introduction to statistical computing languages (R)</li> <li>• Trend-following and momentum strategies</li> <li>• Mean-reversion strategies</li> <li>• Fixed income strategies</li> <li>• Relative value and Event-driven strategies</li> <li>• Structured products and real assets</li> </ul>
<b>Teaching format</b>	Frontal lectures and computer-based sessions.
<b>Learning outcomes</b>	<p><u>Knowledge and understanding:</u></p> <ul style="list-style-type: none"> <li>• Knowledge of modern finance topics with advanced use of quantitative methods. Understanding and knowledge of the tools necessary to estimate and manage financial markets perplexities. Knowledge how to solve real-world quantitative finance problems using the statistical computing languages R</li> </ul> <p><u>Applying knowledge and understanding:</u></p> <ul style="list-style-type: none"> <li>• analyze and solve complex portfolio problems individually and as a member of a group</li> <li>• find the necessary literature and data to solve complex portfolio and general financial problems</li> <li>• being able to program in R in order to solve various problems of quantitative finance</li> </ul> <p><u>Making judgments</u></p> <ul style="list-style-type: none"> <li>• Being able to choose the appropriate methods and techniques to be applied in various real-life situations common to financial industry</li> </ul> <p><u>Communication skills</u></p> <ul style="list-style-type: none"> <li>• Prepare an investment strategy report</li> </ul> <p><u>Learning skills</u></p> <ul style="list-style-type: none"> <li>• being able to understand and find a solution for particular financial problem of a particular investor</li> </ul>

	<p>using analytical reasoning and statistical programming</p> <ul style="list-style-type: none"> <li>• identify and obtain the necessary data to be used as an input for problem-solving tasks.</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>• Coursework report – 60% The report will be focused on implementation of some financial engineering strategy and presentation of the results in written format.</li> <li>• Written exam – 40% The exam will test the knowledge acquired in theoretical lectures and lab sessions.</li> </ul>
<b>Assessment language</b>	English
<b>Evaluation criteria and criteria for awarding marks</b>	<p>Investment report preparation (60%) Final mark from exam assessment (40%)</p> <p>Relevant for exam assessment: mastering the material introduced in class</p>
<b>Required readings</b>	<p>Selected chapters from:</p> <ul style="list-style-type: none"> <li>• CFA Institute Curriculum 2018 edition, Level I –III, CFA Institute, Wiley. ISBN 978-1-946442-43-7</li> <li>• Alternative Investments: CAIA Level I, 3rd Edition, by D.R. Chambers, M. J. P. Anson, K. Black, H. Kazemi, CAIA Association, 2015. Wiley. ISBN: 978-1-119-00336-6</li> <li>• Principles of Financial Engineering by Robert Kosowski and Salih N. Neftci, 2014</li> <li>• Financial engineering and arbitrage in the financial markets. Robert Dibil. 2011.</li> </ul>
<b>Supplementary readings</b>	To be defined