

CURRICULUM

FOR THE MASTER DEGREE PROGRAM IN QUANTITATIVE FINANCE

AT WU WIRTSCHAFTSUNIVERSITÄT WIEN

VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS

On January 29, 2014, pursuant to § 25 (1) item 10 of the Universities Act 2002 (*Universitätsgesetz* 2002), the Senate of WU Wirtschaftsuniversität Wien approved the following resolution of the Committee for Academic Programs dated January 14, 2014, on the curriculum for the Master Degree Program in Quantitative Finance.

§ 1 Objectives

The Master Degree Program in Quantitative Finance provides students with the necessary knowledge and skills to use mathematical models to comprehend economic and business administration-related topics and to apply mathematical models in the field of the economic sciences.

Building on and supplementing a bachelor or other first degree in mathematics/natural sciences or in the social and economic sciences, the Master Degree Program in Quantitative Finance provides graduates with well-founded academic qualifications in combination with a professionally-oriented specialization in the field of capital market-oriented finance. Graduates of the Master Degree Program in Quantitative Finance have comprehensive qualifications in the field of financial sciences and advanced specialized skills in quantitative capital market-related models and methods as well as computational methods in the relevant fields.

The Master Degree Program in Quantitative Finance is aimed particularly at:

- Students who wish to obtain not only immediate practical qualifications but also methodological and academic skills, qualifying them for specialist and management positions in diverse areas of capital market-oriented finance, e.g. asset management, credit and market risk management, treasury positions, financial instrument trading, asset liability management, insurance, financial market analysis and financial engineering
- Students who wish to obtain the necessary prerequisites for higher scientific qualifications (particularly PhD/doctoral programs), for example (future) research and teaching staff at universities

Graduates of the Master Degree Program in Quantitative Finance have the ideal qualifications to prepare them for a career as a quantitative-oriented specialist in the field of finance or for an academic career. After completing the degree program, graduates have the necessary skills to:

- Gain a comprehensive understanding of issues in the field of finance, particularly capital market-related issues, and to analyze these issues using mathematical and statistical methods
- Apply mathematical and statistical methods to solve finance-related problems, and computationally implement these methods

- Obtain and apply relevant information from specialist academic and practical literature
- Take a critical but considered approach to financial market-related data and information systems, and know how and when to apply them
- Work constructively in teams and participate actively in interactive problem-solving processes
- Continually develop and foster individual skills in the sense of life-long learning

In addition, graduates of the Science Track should have the skills to:

- Comprehend and critically discuss current scientific work in the field of finance
- Independently produce academic papers and present them adequately and appropriately for the intended target group
- Advance their specialized theoretical and methodological skills in the context of a relevant PhD program

Graduated of the Industry track should also have the necessary skills to:

- Apply current models and methods for the evaluation and risk analysis of financial instruments and the analysis of financial time series
- Develop and/or apply computational processes to solve finance-related problems in practice, particularly Monte Carlo simulations, non-linear optimization procedures and recursive processes
- Translate theoretical knowledge into management decisions in practice

§ 2 Admission to the program

(1) The prerequisite for admission to the Master Degree Program in Quantitative Finance is the successful completion of a bachelor degree program or a *Fachhochschule* (university of applied sciences) bachelor program or an equivalent first-degree program in a relevant discipline at a recognized post-secondary educational institution in Austria or abroad. Admission to the Master Degree Program in Quantitative Finance is regulated by a selection procedure pursuant to § 64 (6) of the Universities Act 2002.

(2) Dual application of examinations to the Master Degree Program in Quantitative Finance through recognition of examinations completed in the first-degree program in a relevant discipline pursuant to (1) is not permissible.

§ 3 Classification, Structure, Total Credit hours and ECTS

(1) The Master Degree Program in Quantitative Finance is a degree program in social and economic sciences within the meaning of § 54 (1) of the 2002 University Act.

(2) The 4-semester Master Degree Program in Quantitative Finance is made up of 120 ECTS credits and 46 credit hours. The master thesis is worth 20 ECTS credits, and the subjects of the Master Degree Program in Quantitative Finance account for the remaining 100 ECTS credits.

(3) The Master Degree Program in Quantitative Finance will be held entirely in English.

§ 4 Types of Examinations

The types of examinations named in this Curriculum are defined in the Exam Regulations of WU Wirtschaftsuniversität Wien. This Curriculum, together with the Exam Regulations, forms a curriculum pursuant to § 25(1) item 10 of the 2002 University Act.

§ 5 Common Courses and Examinations

The following courses and examinations are compulsory subjects in the Master Degree Program in Quantitative Finance:

<i>Course title</i>	<i>ECTS</i>	<i>Credit hours</i>	<i>Type of examination</i>
<i>In Introduction to Quantitative Finance (14 ECTS)</i>			
Financial Markets and Instruments	4	2	PI*
Mathematics I	5	2	PI
Statistics I	5	2	PI
<i>In Mathematics (15 ECTS)</i>			
Mathematics II	5	2	PI
Optimization	5	2	PI
Computing	5	2	PI
<i>In Probability and Statistics (15 ECTS)</i>			
Statistics II	5	2	PI
Econometrics	5	2	PI
Probability	5	2	PI
<i>In Finance and Economics (12 ECTS)</i>			
Microeconomics	4	2	PI
Principles of Finance	4	2	PI
Continuous Time Finance I	4	2	PI

* PI = *prüfungsimmanent*, class with continuous assessment of student performance

§ 6 Specializations

Students in the Master Degree Program in Quantitative Finance must also complete a Specialization worth a total of 44 ECTS credits in either the Science Track or the Industry Track, as stipulated by the provisions below.

§ 7 Science Track Specialization

(1) The following courses and examinations are compulsory subjects in the Science Track Specialization:

<i>Course title</i>	<i>ECTS</i>	<i>Credit hours</i>	<i>Type of examination</i>
<i>In Quantitative Methods (4 ECTS)</i>			
Financial Econometrics	4	2	PI*
<i>In Finance (12 ECTS)</i>			
Game Theory	4	2	
Corporate Finance	4	2	PI
Asset Pricing	4	2	PI
<i>In Research Methods (16 ECTS)</i>			
Paper Reading and Writing	8	2	PI
Research Seminar I	2	2	PI
Research Seminar II	2	2	PI

Master Thesis Seminar	4	2	PI
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* PI = *prüfungsimmanent*, class with continuous assessment of student performance

(2) A total of 12 ECTS credits in one of the following electives must be completed during the course of the Science Track Specialization:

<i>Course and elective subject title</i>	<i>ECTS</i>	<i>Credit hours</i>	<i>Type of examination</i>
Advanced Topics in Asset Pricing	4	2	PI*
Advanced Topics in Computing	4	2	PI
Advanced Topics in Corporate Finance	4	2	PI
Advanced Topics in Financial Econometrics	4	2	PI
Advanced Topics in Financial Economics	4	2	PI
Advanced Topics in Financial Mathematics	4	2	PI
Advanced Topics in Statistics	4	2	PI
Continuous Time Finance II	4	2	PI
Credit Risk Modeling	4	2	PI
Financial Engineering	4	2	PI
Market Risk Modeling	4	2	PI
Portfolio Management	4	2	PI
Quantitative Risk Management	4	2	PI

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§ 8 Industry Track Specialization

(1) The following courses and examinations are compulsory subjects in the Industry Track Specialization:

<i>Course title</i>	<i>ECTS</i>	<i>Credit hours</i>	<i>Type of examination</i>
<i>In Quantitative Methods (4 ECTS)</i>			
Financial Econometrics	4	2	PI*
<i>In Finance (12 ECTS)</i>			
Game Theory	4	2	PI
Corporate Finance	4	2	PI
Asset Pricing	4	2	PI
<i>In Projects in Quantitative Finance (8 ECTS)</i>			
Industry Lab	8	4	PI
<i>In Academic Writing (4 ECTS)</i>			
Master Thesis Seminar	4	2	PI

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(2) A total of 16 ECTS credits in one of the following electives must be completed during the course of the Industry Track Specialization:

<i>Course and elective subject title</i>	<i>ECTS</i>	<i>Credit hours</i>	<i>Type of examination</i>
Advanced Topics in Asset Pricing	4	2	PI
Advanced Topics in Computing	4	2	PI
Advanced Topics in Corporate Finance	4	2	PI
Advanced Topics in Financial Econometrics	4	2	PI
Advanced Topics in Financial Economics	4	2	PI
Advanced Topics in Financial Mathematics	4	2	PI

Advanced Topics in Statistics	4	2	PI
Continuous Time Finance II	4	2	PI
Credit Risk Modeling	4	2	PI
Financial Engineering	4	2	PI
Market Risk Modeling	4	2	PI
Portfolio Management	4	2	PI
Quantitative Risk Management	4	2	PI

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§ 9 Specific Requirements for Admission to Courses and Examinations

(1) The successful completion of the courses *Financial Markets and Instruments* and *Mathematics I* is the prerequisite for admission to all other courses and examinations of the Master Degree Program in Quantitative Finance. This requirement does not apply to the course *Computing*.

(2) The successful completion of at least 42 ECTS credits from the compulsory common courses as stipulated in § 5 is the prerequisite for admission to courses from either of the two Specializations.

§ 10 Master Thesis

(1) Every student is required to write a master thesis worth 20 ECTS credits.

(2) In their master theses, the students have to demonstrate their ability to independently handle a topic using academic research methods.

(3) The topic of the master thesis is to be chosen from the subjects that make up the Master Degree Program in Quantitative Finance and in agreement with the Academic Director. The students are entitled to propose a topic themselves or to select one from a number of suggestions made by the available supervisors. Apart from that, § 33 of the By-Laws of WU Wirtschaftsuniversität Wien applies.

§ 11 Completion of the Master Program

After a student has successfully completed all required examinations and the master thesis, he or she shall be issued a certificate documenting the successful completion of the Master Degree Program in Quantitative Finance.

§ 12 Academic Degree

Graduates of the Master Degree Program in Quantitative Finance will be awarded the academic degree Master of Science (WU), abbreviated as MSc (WU).

§ 13 Entry into Force

(1) This Curriculum shall enter into force on October 1, 2014.

(2) This Curriculum shall replace the Curriculum for the Master Degree Program in Quantitative Finance based on the resolution of the Committee for Academic Programs dated December 11, 2008, May 14, 2009, and June 5, 2012, approved by the Senate of the Vienna University of Economics and Business on December 17, 2008, May 27, 2009, and June 20, 2012.

§ 14 Transitional Provisions

Students who were enrolled in the enrolled in the Master Degree Program in Quantitative Finance based on the resolution of the Committee for Academic Programs dated December 11, 2008, May 14, 2009, and June 5, 2012, approved by the Senate of the Vienna University of Economics and Business on December 17, 2008, May 27, 2009, and June 20, 2012 when this Curriculum comes into effect are entitled to complete the program by the end of the 2016/17 winter semester under the provisions of the curriculum valid on September 30, 2014.

If the program is not completed within the allotted time, the student will automatically be subject to the provisions of the new Curriculum for the duration of his/her studies. Students are entitled to change to the new curriculum during any enrollment period.