

O3 Newly Developed and Updated Double/Joint Degree Agreements

O3/A1 Mapped Curricula

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1 Objectives

This output complements the curriculum reform leading to a harmonized structure for the 4th semester, which is presented in the package: O2/A1 ‘Curriculum Design for the 4th Semester’. The curriculum reform focuses on the fourth semester, aiming at creating an overlapping formal structure and, at the same time, a diversified offer in terms of specialization.

The following sections provide a curriculum mapping of all the other semesters for the following Master programs of the participating institutions:

- University of Applied Sciences bfi Vienna (UAS) – Master Programme: Quantitative Asset and Risk Management
- University of Bologna (UNIBO) – Master Programme: Quantitative Finance
- University of Economics in Katowice (UEK) – Master Programme: Quantitative Asset and Risk Management
- Alexandru Ioan Cuza University of Iasi (UAIC) - Master Programme: Finance and Risk Management

The core goal of this mapping is to compare the whole curricula at all four institutions. Amongst others, the following aspects are considered:

- The structure and content of the curricula (including allocated ECTS)
- Possible mobility windows (including academic added value)

The aims of the curriculum mapping are the following:

- It is an indispensable tool to design the newly developed and updated double/joint degree agreements, which are part of a separate intellectual output (O3). Although the 4th semester is the primary suggestion for the mobility window, other mobility windows are possible in view of the curriculum mapping that is created in the following section. On the other hand, a successful completion of the Double Degree programme requires that all the fundamental notions in Finance have been covered in both the partner universities that will release the diploma, which can be easily verified throughout the comparison table of the curricula of interest.
- It will facilitate student exchanges also outside the double degree program (for example, students participating in Erasmus+ exchanges), by helping them choosing a study path abroad and by making the reciprocal recognition of the passed exams easier.
- It improves international transparency.
- It highlights similarities and differences of the courses content, thus providing a useful guideline for future cooperation in teaching and research.

2 General rules

The curriculum mapping is based on the following principles.

- A correspondence group is a set of learning activities to be performed at the host university and a set of learning activities at the home university that are recognized as equivalent. In the simplest case, the correspondence can be one-to-one between courses or modules of courses, but more complex situations are allowed, for example, a group of foreign activity corresponding to one or more activities at the home university.
- The gap between the ECTS of two correspondence groups cannot exceed 3 ECTS.
- Courses (or blocks of courses) offered in two different years in the partner universities can be part of correspondence groups.
- Courses or block of courses that are mapped into each other, exhibit a similar content in terms of methodology and learning outputs.

In order to represent the correspondence groups in the Course Structure Diagram of the partner Degree Programs the following colours are adopted.

Colour codes:

Yellow: Fundamentals of Mathematics and Financial Mathematics
Orange: Computer programming
Clear Blue: Financial product
Bright Green: Economics
Lime (Olive Green): Regulation
Pink: Pricing
Sky Blue: Econometrics and quantitative methods in finance
Teal: Risk management
Lavender: Asset management
Grey: Insurance
White: other

3 Mapping UAS-UEK

3.1 Chart of correspondence between the curricula

UAS and UEK are offering almost the same curriculum. Therefore a chart of correspondence is not necessary.

Please find below the curriculum offered by both universities.

		ECTS	Semester
M1 Fundamentals in Quantitative Methods and Finance	Fundamentals of Mathematics and Statistics	4	1
Year 1	Fundamentals of Finance	5	1
	Fundamentals of Economics	3	1
	Programming and Databases	4	1
M2 Financial Econometrics	Multivariate Methods	5	1
Year 1	Time Series Analysis	3	1
M3 Derivative pricing	Equity and Foreign Exchange Derivatives	2	1
Year 1	Fixed Income and Credit Derivatives	4	1
M9 (year 2)	Legal Framework and Ethics	3	1
M4 Risk Measurement	Measurement of Market Risk	4	2
Year 1	Measurement of Credit Risk	4	2
	Measurement of Non-Life Risk	2	2
	Measurement of Life Risk	3	2
M7 Asset Liability Management and Risk Mgmt for banks	Bank Management	5	1
	Risk Controlling and Organisation of Market Risk	2	1
Year 2	Risk Controlling and Organisation of Credit Risk	3	1
	Operational Risk for Banks	2	1
M5 Asset Management	Introduction to Asset Management	2	2
Year 1	Asset class Interest Rate Products	2	2
	Asset class Equity	2	2
	Asset class Foreign Exchange	1	2
	Asset class Credit Products	2	2
	Alternative Investments	2	2
	Structured Products	2	2
M8 Asset Liability Management and Risk Management for Insurances and Pension Funds	ALM and Insurance Management	3	1
Year 2	Management Life Risk	3	1
	Management Non-Life Risk	3	1

M9 Applied Asset Management	Integrating Aspects of Asset Management	6	1
year 2			1
M6 Research Methods (**)	Research Methods	1	2
Year 1	Research Seminar	3	2
M10 Applied Research in Asset and Risk Management Year 2	Advanced Topics in Asset Management Advanced Topics in Insurance Management	6	2 (*)

(*) In the 4th semester UAS offers the Asset management stream in the form of the subject *Advanced Topics in Asset Management*, while UEK offers the insurance stream in the form of the subject *Advanced Topics in Insurance Management*.

(**) In UEK the *Module 6: Research Methods* consists of:

- Financial Reporting Standards – 2 ECTS
- Research Seminar – 2 ECTS

3.2 Possible mobility windows and academic added value

Because curriculum offered in the first three semesters is the same, student exchange is easily possible. There will be a mandatory exchange in the 4th semester: short and long term mobility. During the 4th semester UAS and UEK are offering two different tracks. UAS is offering a specialisation in asset management, UEK in insurance management.

Moreover, students can visit partner universities in 2nd and 3rd semester to get additional international experience. As the partner universities are managed differently - UEK is an old traditional scientific university whereas UAS is a quite new practical oriented university - students can benefit from different teaching approaches.

As the UAS is not allowed currently to offer PhD programmes students from UAS have the possibility to follow a PhD programme at UEK. What is more, in the 4th semester there is a possibility to participate in a course 'Advanced Issues in Corporate Finance' which let students enlarge their knowledge about firm valuation.

3.3 Requirements to obtain degrees and degrees awarded

To get a (JD)/DD students have to spend at least one semester at the host university. Exchange is possible in the 2nd, 3rd and 4th semester. They have to acquire in each semester 30 ECTS to be eligible for the (JD)/DD.

At UAS the students get awarded the degree "Master of Arts in Business (MA)".



At UEK the students get awarded the degree “Magister (mgr.) in Quantitative Asset and Risk Management”.

4 Mapping UNIBO-UEK

4.1 Chart of correspondence between the curricula

UNIBO:

1st year	Hours	ECTS	Semester
MATHEMATICS AND PROBABILITY (I.C.)			
CALCULUS	30	6	1
PROBABILITY	30	6	1
ACTUARIAL AND FINANCIAL MATHEMATICS (I.C.)			
FINANCIAL MATHEMATICS	30	6	2
ACTUARIAL MATHEMATICS	30	6	2
ECONOMICS AND FINANCE (I.C.)			
CORPORATE FINANCE	30	6	2
FINANCIAL PRODUCTS AND MARKETS	30	6	2
ECONOMICS OF FINANCIAL MARKETS	30	6	2
STATISTICS AND ECONOMETRICS (I.C.)			
ECONOMETRICS	30	6	1
STATISTICS	30	6	1
FINANCIAL MARKET REGULATION	30	6	1
2nd year			
NUMERICAL ANALYSIS (I.C.)			
COMPUTER PROGRAMMING	30	6	1
NUMERICAL METHODS	30	6	1
Choose 12 ECTS among			
ECONOMETRICS OF FINANCIAL MARKETS	30	6	1
STATISTICS OF FINANCIAL MARKETS	30	6	1
CREDIT DERIVATIVES	30	6	1
INTEREST RATE MODELS	30	6	1
FINANCIAL ENGINEERING FOR ASSET MANAGEMENT	30	6	1
STATISTICAL METHODS FOR ASSET MANAGEMENT	30	6	1
ADVANCED METHODS OF RISK MANAGEMENT 1	30	6	1
ADVANCED METHODS OF RISK MANAGEMENT 2	30	6	1
ADVANCED METHODS OF INSURANCE 1	30	6	1
ADVANCED METHODS OF INSURANCE 2	30	6	1
WORKSHOP IN QUANTITATIVE FINANCE		6	2
FREE COURSE	30	6	2
ADVANCED TOPICS IN QUANTITATIVE METHODS IN FINANCE		6	2

UEK:

		ECTS	Semester
M1 Fundamentals in Quantitative Methods and Finance	Fundamentals of Mathematics and Statistics	4	1
Year 1	Fundamentals of Finance	5	1
	Fundamentals of Economics	3	1
	Programming and Databases	4	1
M2 Financial Econometrics	Multivariate Methods	5	1
Year 1	Time Series Analysis	3	1
M3 Derivative pricing	Equity and Foreign Exchange Derivatives	2	1
Year 1	Fixed Income and Credit Derivatives	4	1
M9 (year 2)	Legal Framework and Ethics	3	1
M4 Risk Measurement	Measurement of Market Risk	4	2
Year 1	Measurement of Credit Risk	4	2
	Measurement of Non-Life Risk	2	2
	Measurement of Life Risk	3	2
M7 Asset Liability Management and Risk Mgmt for banks	Bank Management	5	1
	Risk Controlling and Organisation of Market Risk	2	1
Year 2	Risk Controlling and Organisation of Credit Risk	3	1
	Operational Risk for Banks	2	1
M5 Asset Management	Introduction to Asset Management	2	2
Year 1	Asset class Interest Rate Products	2	2
	Asset class Equity	2	2
	Asset class Foreign Exchange	1	2
	Asset class Credit Products	2	2
	Alternative Investments	2	2
	Structured Products	2	2
M8 Asset Liability Management and Risk Management for Insurances and Pension Funds	ALM and Insurance Management	3	1
Year 2	Management Life Risk	3	1
	Management Non-Life Risk	3	1
M9 Applied Asset Management	Integrating Aspects of Asset Management	6	1
Year 2			1
M6 Research Methods	Financial Reporting Standards	2	2
Year 1	Research Seminar	2	2
M10 Applied Research in Asset and Risk Management Year 2	Advanced Topics in Insurance Management	6	2

4.2 Possible mobility windows and academic added value

On the basis of the above-designed correspondences of the Course Structure Diagram of the Partner Degree Programs, the following exchange periods are suggested.

In the 4th semester: all activities (Advanced Topics, thesis and final exam).

In the 3rd semester:

From UEK to UNIBO:

Adv. Methods of Risk Mgmt (12 or 6)
Adv. Methods of Insurance (6 or 12)
Statistical Methods or Financial Engineering for Asset Mgmt (6)
Financial market regulation (6)

From UNIBO to UEK:

Programming and databases (4)
Multivariate methods (5)
Time series and analysis (3)
Bank management (5)
Risk controlling and Organisation of Market Risk (2)
Risk controlling and Organisation of Credit Risk (3)
Operational Risk for Banks (2)
Choose between:
M8 (ALM, Insurance) (9)
Integrating Aspects of Asset Management (6)

Both universities are not located in the main cities of their respective countries, but boast a long tradition of industry development and innovation. The bilateral exchange of students allows for building the fundamentals for further societal development – in the form of applications by better understanding market behaviour as well as education by creation of an excellent specialisation. The mobility period allows to experience a different management system and teaching approach. In both institutions adequate facilities are available (rooms, labs, libraries, offices for visiting professors, portable computers, printers). More importantly, the mobility windows creates the option to select some specialized courses that are not offered at the home university, thus allowing for a better achievement of one's own cultural and professional target. In particular, the added academic value of each mobility window in the third semester can be shortly described as follows.

- The exchange period from UEK to UNIBO increases the number of courses that can be selected, as UNIBO offers a larger number of alternatives in the 3rd semester. Moreover, the methodology builds on more advanced quantitative tools (mathematics for stochastic processes and advanced econometrics)

- The exchange period from UNIBO to UEK allows students to benefit from a more practical approach, especially in the field of risk controlling.
- During the 4th semester UEK and UNIBO are offering two different tracks. UEK is offering a specialisation in insurance, UNIBO in quantitative methods in finance.

4.3 Requirements to obtain degrees and degrees awarded

Regulations at UNIBO:

To get a DD students have to spend at least one semester at the host university. Exchange is possible in the 3rd and 4th semester. Students have to acquire in each semester 30 ECTS to be eligible for the DD.

At UNIBO the students get awarded the degree “Laurea Magistrale in Quantitative Finance”.

Regulations at UEK:

To get a DD students have to spend one or two semesters at the host university. Exchange is possible in the 3rd or/and 4th semester. Students have to acquire in each semester 30 ECTS to be eligible for the DD.

At UEK the students get awarded the degree “Magister (mgr.) in Quantitative Asset and Risk Management”.

Comparison and results:

The core goal of this mapping was to compare the curricula between UNIBO and UEK along predefined dimensions:

- The structure and content of the curricula (including allocated ECTS and workload)
- Possible mobility windows (including academic added value)
- The requirements to obtain degrees and the degree awarded

As a result it can be stated that all dimensions described above are fulfilled: the structure and content of the curricula are corresponding in major parts, the mobility windows could easily be defined and the requirements to obtain a degree are quite similar in each of the institutions.

5 Mapping UEK-UAIC

5.1 Chart of correspondence between the curricula

UEK:

		ECTS	Semester
M1 Fundamentals in Quantitative Methods and Finance	Fundamentals of Mathematics and Statistics	4	1
Year 1	Fundamentals of Finance	5	1
	Fundamentals of Economics	3	1
	Programming and Databases	4	1
M2 Financial Econometrics	Multivariate Methods	5	1
Year 1	Time Series Analysis	3	1
M3 Derivative pricing	Equity and Foreign Exchange Derivatives	2	1
Year 1	Fixed Income and Credit Derivatives	4	1
M9 (year 2)	Legal Framework and Ethics	3	1
M4 Risk Measurement	Measurement of Market Risk	4	2
Year 1	Measurement of Credit Risk	4	2
	Measurement of Non-Life Risk	2	2
	Measurement of Life Risk	3	2
M7 Asset Liability Management and Risk Mgmt for banks	Bank Management	5	1
	Risk Controlling and Organisation of Market Risk	2	1
Year 2	Risk Controlling and Organisation of Credit Risk	3	1
	Operational Risk for Banks	2	1
M5 Asset Management	Introduction to Asset Management	2	2
Year 1	Asset class Interest Rate Products	2	2
	Asset class Equity	2	2
	Asset class Foreign Exchange	1	2
	Asset class Credit Products	2	2
	Alternative Investments	2	2
	Structured Products	2	2
M8 Asset Liability Management and Risk Management for Insurances and Pension Funds	ALM and Insurance Management	3	1
Year 2	Management Life Risk	3	1
	Management Non-Life Risk	3	1
M9 Applied Asset Management	Integrating Aspects of Asset Management	6	1
Year 2			1
M6 Research Methods	Financial Reporting Standards	2	2
Year 1	Research Seminar	2	2
M10 Applied Research in Asset and Risk Management Year 2	Advanced Topics in Insurance Management	6	2

UAIC:

Course Name	ECTS credits	Semester
Year 1		
Financial Markets and Instruments	5	1
Research Methods in Economics and Business	10	1
Financial Reporting and Analysis	5	1
Electives (2)	10	
Programming and Databases	5	1
Quantitative Methods in Finance and Risk Management	5	1
Organization Theory and Design	5	1
Information Systems and Business Processes	5	1
Financial Decisions and Corporate Strategy	5	2
Advanced Mathematics for Economics	5	2
Financial Econometrics	10	2
Electives (2)	10	
Monetary and Financial Macroeconomics	5	2
Microeconomics of Financial Institutions	5	2
International Financial Management	5	2
Fundamentals of Risk Measurement	5	2
Year 2		
Research Methods in Finance	10	3
Electives (4)	20	
Corporate Valuation	5	3
Responsible Finance and Investing	5	3
Portfolio Theory	5	3
Theory of Corporate Finance	5	3
Derivative Instruments	5	3
Banking, Insurance and Risk Management	5	3
Credit Risk Management	5	3
Market Risk Management	5	3
Operational Risk Management	5	3
Taxes and Business Strategy	5	3
Business Ethics	5	3
Master's Thesis Preparation	18	4
Advanced Topics in Bank Risk Management	6	4
Electives (1)	6	
Governance and Regulation	6	4
Institutional and Personal Investment	6	4

5.2 Possible mobility windows and academic added value

In the 4th semester: all activities (Advanced Topics, Thesis or Master's Thesis Preparation and final exam or elective course).

In the 3rd semester:

From UEK to UAIC:

Market Risk Management (5), Credit Risk Management (5), Operational Risk Management (5)
Banking, Insurance, and Risk Management (5)
Portfolio Theory (5)
Responsible Finance and Investing or Business Ethics (5)

From UAIC to UEK:

Multivariate Methods (5), Time Series Analysis (3)
Bank Management (5), Risk Controlling and Organization of Market Risk (2), Risk Controlling and Organization of Credit Risk (3), Operational Risk for Banks (2)
Integrating Aspects of Asset Management (6)
Fixed Income and Credit Derivatives (4)

UAIC and UEK are old higher education institutions with a tradition of excellence in research and education: Both institutions are not located in the main cities of their respective countries.

The bilateral exchange will allow students to experience a different culture and teaching approach from another country with a similar path of EU integration.

The mobility windows organized during the 3rd or 4th semester will give students the possibility to select some specialized courses that are not offered at the home university:

- during the 3rd semester, exchange students from UAIC to UEK will benefit from a more practical approach, especially in the field of risk controlling, whilst exchange students from UEK to UAIC will benefit from courses in ethics and management of credit, market and operational risks, while preserving a good preparation in the core specialization.
- during the 4th semester, UEK and UAIC are offering two different tracks. UEK is offering a specialisation in insurance management, UAIC in bank risk management. In addition, students from the both universities will be able to participate in one of the elective courses offered by the host institution.

5.3 Requirements to obtain degrees and degrees awarded

Regulations at UEK:

To get a DD students have to spend one or two semesters at the host university. Exchange is possible in the 3rd or/and 4th semester. Students have to acquire in each semester 30 ECTS to be eligible for the DD.

At UEK the students get awarded the degree “Magister (mgr.) in Quantitative Asset and Risk Management”.

Regulations at UAIC:

To get a DD students have to spend at least one semester at the host university. Exchange is possible in the 3rd and 4th semester. Students have to acquire in each semester 30 ECTS to be eligible for the DD.

At UAIC the students get awarded the degree “Master (in Finance and Risk Management)”.

Comparison and results:

The core goal of this mapping was to compare the curricula between UEK and UAIC along predefined dimensions:

- The structure and content of the curricula (including allocated ECTS and workload)
- Possible mobility windows (including academic added value)
- The requirements to obtain degrees and the degree awarded

As a result it can be stated that all dimensions described above are fulfilled: the structure and content of the curricula are corresponding in major parts, the mobility windows could easily be defined and the requirements to obtain a degree are quite similar in each of the institutions.