Course title: Principles of Economics and Mathematics

Professors: Micael Castanheira and Bram De Rock

1. Description
Describe the course. What is it about? What competences will be developed?

The insights of economics and basic mathematical and statistical tools are needed to understand the underlying fundamentals of financial markets.
Economic principles and econometric techniques can therefore be useful to develop the regulation of these markets and to apply them in practice.
The course Principles of Economics and Mathematics provides a short and accessible introduction to postgraduate students that are not familiar with the basic insights of Economics, Mathematics and Statistics. This will allow the students to better understand the models and techniques used in the courses taught in the Advanced Master in Financial Markets.

2. Learning outcomes/Objectives of the course

At the end of the 24h-courses, the students will be able to:
- Understand and interpret basic notions of Economics, Mathematics and Statistics
- Apply Economic and mathematic insights to explain behavior of firms, consumers, governments,…

3. Course structure

Per session, what is the general theme taught to reach the objectives, and which subjects will be developed during that session?

Session	General theme	Subjects
1	Session 1 of Mathematics part:	- Functions - Derivatives - Concavity and convexity
2	Session 2 of Mathematics part:	- Optimization - Financial mathematics
3	Session 3 of Mathematics part:	- Matrices - Solving system of linear equations -
4	Session 4 of Mathematics part:	- Fundamentals of probability theory - -
5	Session 1 of Economics part	-Supply and Demand -Elasticity -
6	Session 2 of Economics part	- Inter-Market Linkages - Market Structures -
7	Session 3 of Economics part	- Market Structures - -
8	Session 4 of Economics part	- International Trade - Market Failures and Public Economics -

4. Learning methods

What type of learning methods will you use during your 24h? Please cross or underline.

o <u>Lectures</u>
o Case Studies
o Classroom Workshop
o Personal project
o Group project
o Labs
o Internship
o E-learning
o <u>Others</u>: exercises in class and at home

5. Evaluation

Evaluation type
What type of evaluation will you do? And what is the ponderation if different methods?
Highly recommended: 40% of the grading should be the result of individual work.

o	Written exam	100 %	
o	Oral exam	%	
o	Groupwork assignment	%	
o	Individual assignment	%	
o	Groupwork presentation	%	
o	Individual presentation	%	
o	Continuous assessment	%	
o	Project	%	
o	Paper	%	
o	Class participation	%	
o	Others	%	

= 100% of the evaluation

Evaluation criteria
What criteria will you use for grading the evaluation?

• Can you reproduce some key aspects of the material reviewed in class
• Can you apply the insights of the course to concrete questions
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Resit
What do you propose to the student in case of resit? (50% is needed to succeed).

There will be an oral exam to evaluate if the student grasps the basic insights.

Please be aware you have to be present for the evaluation.

6. Professor information

Programme	Advanced Master in Financial Markets
Course title	Principles of Economics, Mathematics and Statistics
Professor name	Micael Castanheira and Bram De Rock
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Biography – *In maximum 5-10 lines, resume a biography synopsis in a narrative text (mainly your experiences & background)*	Micael Castanheira *is Professor of Economics at the Solvay Brussels School of Economics and Management. He also teaches at Louvain and Namur universities. He taught previously macroeconomics at Bocconi University (Milan).* Mr. Castanheira has published extensively in international journals on various economic topics. *He is S*cientific Advisor for the *Institut des Comptes Nationaux* (Belgian Ministry of Economy) and was Director of the *European Network for Training in Economic Research* (ENTER) from 2006 to 2011. He is a member of the *Institut Belge des Finances Publiques.* Bram De Rock *is Professor of Mathematical Economics at Solvay Brussels School of Economics and Management and Professor of Statistics at KU Leuven. He is also* Honorary Senior Research Associate at University College London (UCL) and International research fellow at the Institute for Fiscal Studies (IFS). Mr. De Rock has received numerous prestigious

	academic awards, including Winner of the Research Council Award of the KU Leuven (2012) and recipient of a starting grant of the European Research Council (ERC) (2010). He has written several books and has contributed chapters to other books. He has published extensively in reputed international journals and several of his articles have received awards, including on the revealed preference approach to collective consumption behaviour.