



5 credits

30.0 h

Q2

Teacher(s)	Vrins Frédéric ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	<ol style="list-style-type: none"> <li>1. Part I : Black-Scholes Model (discrete time Cox-Ross-Rubinstein, continuous time model Black-Scholes-Merton, greeks)</li> <li>2. Part II: arbitrage-free pricing (fundamental theorem of asset pricing).</li> <li>3. Part III : Interest rates products (FRAs, Swaps, caps, floors) and pricing (affine short rate model, arbres binomiaux).</li> <li>4. Part IV : Limits of the model and advanced methods.</li> </ol>
Aims	<p><b>During their programme, students of the LSM Master's in management or Master's in Business engineering will have developed the following capabilities'</b></p> <p>2.2 Master highly specific knowledge in one or two areas of management : advanced and current research-based knowledge and methods.</p> <p>2.3 Articulate the acquired knowledge from different areas of management.</p> <p>2.4 Activate and apply the acquired knowledge accordingly to solve a problem.</p> <p>3.1 Conduct a clear, structured, analytical reasoning by applying, and eventually adapting, scientifically based conceptual frameworks and models, to define and analyze a problem.</p> <p>1 6.1 Work in a team :Join in and collaborate with team members. Be open and take into consideration the different points of view and ways of thinking, manage differences and conflicts constructively, accept diversity.</p> <p>8.1 Express a clear and structured message, both orally and in writing in their mother tongue, in English and ideally, in a third language, adapted to the audience and using context specific communication standards.</p> <p>8.3 Persuade and negotiate :understand the needs and viewpoints of others, put forward their reasoning in an appropriate, relevant and persuasive manner, able to bring out points of agreement, even in antagonistic situations.</p> <p>-----</p> <p><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>
Evaluation methods	<p><b>Continuous evaluation</b></p> <ul style="list-style-type: none"> <li>• Date: Will be specified later</li> <li>• Type of evaluation: Project</li> <li>• Comments: 35% of pts: includes intermediate presentations, final presentation and report</li> </ul> <p><b>Evaluation week</b></p> <ul style="list-style-type: none"> <li>• Oral: No</li> <li>• Written: No</li> <li>• Unavailability or comments: No</li> </ul> <p><b>Examination session</b></p> <ul style="list-style-type: none"> <li>• Oral: 3 Students/hour</li> <li>• Written: No</li> <li>• Unavailability or comments: The students receive the questions, prepare for 1 hour and come to present their answers.</li> </ul>
Teaching methods	<ul style="list-style-type: none"> <li>• 15 courses of 2 hours including exercices and programming sessions.</li> <li>• Team works on R and Bloomberg. The students will also be invited to introduce themselves some financial products and discuss some methods to value and hedge those</li> </ul>
Content	The objective of this course is to introduce fundamental concepts valuing derivatives using the no-arbitrage assumption.

Bibliography	<ul style="list-style-type: none"><li>• Slides, Excel workbook and R code.</li><li>• <b>Lectures conseillées :</b><ul style="list-style-type: none"><li>- Hull, J. Options, Futures and Other derivatives.</li><li>- Portrait &amp; Poncet, Finance de marché, Dalloz, 2009.</li><li>- Joshi, M. : Concepts and Practice of Mathematical Finance, Cambridge University Press, 2003.</li><li>- Shreve, S. : Stochastic calculus for Finance I &amp; II, Springer 2004.</li></ul></li></ul>
Faculty or entity in charge	CLSM

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Business Engineering	INGE2M	5		
Master [120] in Economics: General	ECON2M	5		
Master [120] in Business Engineering	INGM2M	5		