

## Hong Kong Baptist University

Programme:	<b>Master of Science in Mathematical Finance</b>																		
Department:	Mathematics																		
Course Code:	<b>MFFM7050</b>	Level:	Graduate level																
Course Title:	Mathematical Finance																		
Prerequisites:																			
Duration:	42 hours	Units:	3 (3,3,0)																
Course Description:	Topics from replication of trading strategies, arbitrage, completeness, martingale representation theorem, fundamental theorem of finance, stochastic differential equations, and Black - Scholes formula of option pricing.																		
Texts & References: <i>(* recommended textbook(s))</i>	<ul style="list-style-type: none"> <li>*1. Tomas Bjork. (1998). <i>Arbitrage theory in continuous time</i>. Oxford U.P.</li> <li>*2. Stanley R. Pliska. (1997). <i>Introduction to mathematical finance: discrete time models</i>. Blackwell Publisher.</li> <li>3. Martin Baxter. (1996). <i>Financial calculus: an introduction to derivative pricing</i>. Andrew Rennie.</li> <li>4. P. Wilmott, S. Howinson, J Dewunne. (1995). <i>The mathematics of financial derivatives: A student introduction</i>. Cambridge U.P.</li> <li>5. John Hull. (1992). <i>Options, futures and other derivative securities</i>. Prentice-Hall.</li> <li>6. D. Lamberton, B. Lapevre. (1996). <i>Introduction to Stochastic Calculus Applied to Finance</i>. Chapman Hall/CRC Press.</li> <li>7. L. Clewlow, Ch. Strickland. (1998). <i>Implementing derivative models</i>. John Wiley and Sons, Ltd.</li> </ul>																		
Learning Outcomes (LO):	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. understand the existing, as well as proposed new, mathematical models of financial processes and instruments;</li> <li>2. have a working knowledge of financial markets;</li> <li>3. have a working knowledge of financial contracts;</li> <li>4. perform simple trading and implement investment strategies.</li> </ol>																		
Pedagogical Methods:	<table style="width: 100%; border: none;"> <tr> <td><input checked="" type="checkbox"/> Lecture</td> <td><input type="checkbox"/> Service learning</td> </tr> <tr> <td><input type="checkbox"/> Guest speakers</td> <td><input type="checkbox"/> Internship</td> </tr> <tr> <td><input type="checkbox"/> Case study</td> <td><input type="checkbox"/> Field study</td> </tr> <tr> <td><input type="checkbox"/> Role playing</td> <td><input type="checkbox"/> Company visits</td> </tr> <tr> <td><input type="checkbox"/> Student presentation</td> <td><input type="checkbox"/> e-learning</td> </tr> <tr> <td><input type="checkbox"/> Project</td> <td><input type="checkbox"/> Independent study</td> </tr> <tr> <td><input type="checkbox"/> Simulation game</td> <td><input type="checkbox"/> Others_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Exercises and problems</td> <td></td> </tr> </table>			<input checked="" type="checkbox"/> Lecture	<input type="checkbox"/> Service learning	<input type="checkbox"/> Guest speakers	<input type="checkbox"/> Internship	<input type="checkbox"/> Case study	<input type="checkbox"/> Field study	<input type="checkbox"/> Role playing	<input type="checkbox"/> Company visits	<input type="checkbox"/> Student presentation	<input type="checkbox"/> e-learning	<input type="checkbox"/> Project	<input type="checkbox"/> Independent study	<input type="checkbox"/> Simulation game	<input type="checkbox"/> Others_____	<input checked="" type="checkbox"/> Exercises and problems	
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Major Assessment Methods: For each Major Assessment Method below, please indicate the specific pedagogical /assessment methods involved (by putting a ✓ in the relevant box(es) on the right-hand side).	Case Study	Role Playing	Student Presentation	Individual project/paper	Group	Simulation Game	Exercises & problems	Service learning	Internship	Field Study	Company visits	Written examination	Oral examination	Others (please specify)
Class Participation/ Discussion ( %)														
Assignment(s) (40%)							✓							
Test(s) ( %)														
Examination (60%)												✓		
Others (please specify) _____ ( %)														
Course Content:												Hours	LO no.	
	I. Review of the stochastic integral											5	1	
	II. Stochastic differential equations											6	1	
	III. Arbitrage pricing											10	1,2,3,4	
	IV. Black-Scholes hedging (completeness, Delta-hedging, and incompleteness)											10	1,2,3,4	
	V. Continuous time models for Foreign Exchange											7	1,3,4	
	VI. Discrete models (binomial)											4	1,4	
Total											42 hrs.			

Course Coordinators:	Prof. Michael Ng
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