Faculty	Natural S	ciences		
Home Department	Mathematics and Applied Mathematics			
Module Topic	Mathematics			
Generic Module Name	Mathematics 322			
Alpha-numeric Code	MAT322			
NQF Level	7			
NQF Credit Value	30			
Duration	Year			
Proposed semester to be	Both Sen	nesters		
offered	Dour Con			
Programmes in which the	BSc (Mathematical and Statistical Sciences) (3227, 3031)			
module will be offered	BSc (Physical Science) (3233, 3120)			
	BSc (Computer Science) (3221, 3023)			
Year Level	3			
Main Outcomes	On completion of this module students should be able to:			
	 Implen 	nent the basic tools of	the	geometric Brownian
	motion	of stock prices.		
	 Use th 	eir knowledge of eleme	enta	ry cases of pricing via
	arbitra	ge of options to solve p	prob	lems.
	Use th	eir knowledge of vanill	a ar	id exotic options and their
	valuati	on to solve problems.		
	Use th	e Black-Scholes formu	lla to	o solve option pricing
	proble	MS.		
	 Use th 	e n-period binomiai mo	odei	method to solve
	proble	MS. Anto Corlo aimulation (each to colve antion
	 Use IVI 		appi	oach to solve option
Main Contant	pricing	propierns.		
Wain Content	Elementary probability theory			
	Normal random variables Cosmetrie Brownian motion			
	Preser	t value analysis		
	 Fieseill value alialysis Introduction to derivatives 			
	Pricing	contract via arhitrade	Th	e arbitrage theorem
	The Black-Scholes formula			
	Vanilla ontions			
	 Vanilla 	ontions		
	 Vanilla Multi-r 	options	meth	nod
	 Vanilla Multi-p Option 	options period binomial model r valuations by expecte	meth ed ut	nod ility
	 Vanilla Multi-p Option Exotic 	eriod binomial model r valuations by expecte options	meth ed ut	nod ility
	 Vanilla Multi-p Option Exotic Portfol 	options eriod binomial model r valuations by expecte options io optimization	meth ed ut	nod ility
	 Vanilla Multi-p Option Exotic Portfol Autore 	options eriod binomial model r valuations by expecte options io optimization gressive models and n	meth ed ut mea	nod ility n reversion
	 Vanilla Multi-p Option Exotic Portfol Autore Simula 	options eriod binomial model r valuations by expecte options io optimization gressive models and n ations-random walk, Mo	meth ed ut mea onte	nod ility n reversion Carlo methods
Pre-requisite modules	 Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 	options veriod binomial model r valuations by expecte options io optimization gressive models and n ations-random walk, Mo and (MAT212 OR MAT	meth ed ut mea onte T221	nod ility n reversion Carlo methods
Pre-requisite modules Co-requisite modules	 Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None 	a options beriod binomial model r valuations by expected options io optimization gressive models and r titions-random walk, Ma and (MAT212 OR MAT	meth ed ut mea <u>onte</u> T221	nod ility n reversion Carlo methods
Pre-requisite modules Co-requisite modules Prohibited module	Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None None	a options beriod binomial model r valuations by expected options io optimization gressive models and r titions-random walk, Mo and (MAT212 OR MAT	methed ut	nod ility n reversion Carlo methods
Pre-requisite modules Co-requisite modules Prohibited module Combination	Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None None	a options beriod binomial model r valuations by expecte options io optimization gressive models and n titons-random walk, Mo and (MAT212 OR MAT	meth ed ut mea <u>onte</u> T221	nod ility n reversion Carlo methods
Pre-requisite modules Co-requisite modules Prohibited module Combination Breakdown of Learning	Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None None Hours	a options beriod binomial model r valuations by expecte options io optimization gressive models and n titons-random walk, Mo and (MAT212 OR MAT	meth ed ut mea <u>onte</u> T221	nod ility Carlo methods
Pre-requisite modules Co-requisite modules Prohibited module Combination Breakdown of Learning Time	Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None None Hours	a options beriod binomial model r valuations by expecte options io optimization gressive models and n titions-random walk, Mo and (MAT212 OR MAT Time-table Requirement per	meth ed ut nea onte	nod ility Carlo methods
Pre-requisite modules Co-requisite modules Prohibited module Combination Breakdown of Learning Time	Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None None Hours	a options beriod binomial model r valuations by expecte options io optimization gressive models and n titions-random walk, Mo and (MAT212 OR MAT Time-table Requirement per week	methed ut	nod ility Carlo methods
Pre-requisite modules Co-requisite modules Prohibited module Combination Breakdown of Learning Time Contact with lecturer / tutor:	Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None None Hours 39	Time-table Requirement per Waluations by expected options io optimization gressive models and n and (MAT212 OR MAT	meti mea onte T221	nod ility Carlo methods
Pre-requisite modules Co-requisite modules Prohibited module Combination Breakdown of Learning Time Contact with lecturer / tutor: Assignments & tasks:	Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None None Hours 39 90	Time-table Requirement per week Lectures p.w.	methed ut mea <u>onte</u> T22 ⁻ 2 1	nod ility Carlo methods) Other teaching modes that does not require time-table
Pre-requisite modules Co-requisite modules Prohibited module Combination Breakdown of Learning Time Contact with lecturer / tutor: Assignments & tasks: Practicals:	Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None None Hours 39 90 27	Time-table Requirement per week Lectures p.w. Tutorials p.w.	methed ut mea onte T22 ²	nod ility n reversion Carlo methods) Other teaching modes that does not require time-table
Pre-requisite modules Co-requisite modules Prohibited module Combination Breakdown of Learning Time Contact with lecturer / tutor: Assignments & tasks: Practicals: Assessments:	 Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None None Hours 39 90 27 0 	Time-table Requirement per week Lectures p.w. Tutorials p.w.	methed ut mea onte T22 ¹ 1 0	nod ility n reversion Carlo methods) Other teaching modes that does not require time-table
Pre-requisite modules Co-requisite modules Prohibited module Combination Breakdown of Learning Time Contact with lecturer / tutor: Assignments & tasks: Practicals: Assessments: Self-study:	 Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None None Hours 39 90 27 0 144 	Time-table Requirement per week Lectures p.w. Tutorials p.w.	methed ut mea onte T221	nod ility n reversion Carlo methods)) Other teaching modes that does not require time-table
Pre-requisite modules Co-requisite modules Prohibited module Combination Breakdown of Learning Time Contact with lecturer / tutor: Assignments & tasks: Practicals: Assessments: Self-study: Other: Tutorials	 Vanilla Multi-p Option Exotic Portfol Autore Simula MAT211 None None Hours 39 90 27 0 144 0 	Time-table Requirement per week Lectures p.w. Tutorials p.w.	methed ut mea <u>onte</u> <u>2</u> 1 0	nod ility n reversion Carlo methods)) Other teaching modes that does not require time-table

Method of Student	Continuous Assessment (CA): 100%
Assessment	Final Assessment (FA): 0%
Assessment Module Type	Continuous Assessment (CA)