Lecture Plan

Name of the College: Government College of Arts, Science and Commerce, Sanquelim-Goa

Name of Faculty: Minoshka D'Souza	**Subject:** Mathematics	
Paper code: MAT-624, Mathematics for Financial Market	**Program:** M.Sc.	**Division: -**
Academic year: 2024-25	**Semester:** III	**Total Lectures:** 60

Course Objectives: At the end of this course the student will gain knowledge of basic concepts in financial markets

Expected Course Outcome: On completion of this course the learner will be familiar with various concepts in finance including risk-free assets, risky assets, discrete time market models, portfolio management, forward and futures contracts and options

Student Learning Outcome: The the end of the course the student will be able to

1. Recall and explain concepts in simple market models, risk free assets, risky assets, dynamics of stock prices, portfolio management, forward contracts, futures contracts, options and variable interest rates.
2. Prove important theorems related to topics studied.
3. Apply knowledge gained to solve basic mathematical problems in finance.
4. Analyse, compare and differentiate between various concepts studied in order to solve problems.

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
June	18/06/2024	22/06/2024	4	**Introduction: A Simple Market Model:** Basic Notions and Assumptions, No-Arbitrage Principle, One-Step Binomial Model, Risk and Return, Forward Contracts	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
	24/06/2024	29/06/2024	4	**Introduction: A Simple Market Model:** Call and Put Options, Managing Risk with Options **Risk-Free Assets:** Time Value Money, Money Market	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
July	01/07/2024	06/07/2024	4	**Risk-Free Assets:** Money Market	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
	08/07/2024	13/07/2024	4	**Risky Assets:** Dynamics of Stock Prices, Binomial Tree Model	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
	15/07/2024	20/07/2024	4	**Risky Assets:** Binomial Tree Model	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering

				Discrete Time Market Models: Stock and Money Market Models			by Marek Capinski and Tomasz Zastawniak
	22/07/2024	27/07/2024	4	**Discrete Time Market Models:** Stock and Money Market Models, Extended Models	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
July August	29/07/2024	03/08/2024	4	**Portfolio Management:** Risk, Two Securities	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
August	05/08/2024	10/08/2024	4	**Portfolio Management:** Two Securities, Several Securities	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
	12/08/2024	17/08/2024	4	**Portfolio Management:** Capital Asset Pricing Model	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
	19/08/2024	24/08/2024	4	**Forward and Futures Contracts:** Forward Contracts, Futures	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
	26/08/2024	31/08/2024	4	**Forward and Futures Contracts:** Futures **Options: General Properties:** Definitions, Put-Call Parity	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak

September	02/09/2024	07/09/2024	2	**Options: General Properties:** Bounds on Option Prices	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
	09/09/2024	14/09/2024	2	**Options: General Properties:** Variables Determining Option Prices	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
	16/09/2024	21/09/2024	4	**Options: General Properties:** Variables Determining Option Prices, Time Value of Options	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
	23/09/2024	28/09/2024	4	**Option Pricing:** European Options in the Binomial Tree Model	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
September October	30/09/2024	05/10/2024	4	**Option Pricing:** American Options in the Binomial Tree Model, Black-Scholes Formula	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak
October	07/10/2024	12/10/2024	2	Revision	Exercises on topics covered	Latex, Smart Board	An Introduction to Financial Engineering by Marek Capinski and Tomasz Zastawniak

*** Assessment Rubrics**

Component	Max Marks
ISA 1	20
ISA 2	20
ISA 3	20
Semester End Exam	40