

UNIVERSITY OF MADRAS
B.Sc. DEGREE PROGRAMME IN MATHEMATICS
 SYLLABUS WITH EFFECT FROM 2023-2024

Title of the Course		FINANCIAL MATHEMATICS					
Paper Number		SKILL ENHANCEMENT COURSE - I					
Category	SEC	Year	I	Credits	2	Course Code	134S1A
		Semester	I				
Instructional Hours per week		Lecture	2	Tutorial	0	Lab Practice	--
				Total	2		
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		<ul style="list-style-type: none"> • Understand the concept of time value of money and its applications in finance • Analyse different types of annuities and calculate their present and future values • Understand the principles of bond valuation and pricing • Analyse different types of stocks and evaluate their performance • Understand the principles of option valuation and hedging 					
Course Outline		<p>Unit – I: Time Value of Money: Simple & Compound Interest, Present Value & Future Value, Annuities & Perpetuities Hours: 6</p> <p>Unit – II: Bonds: Net Present Value and Internal Rate of Return, Price and Yield of a Bond, Term Structure, Duration, Immunization Hours: 6</p> <p>Unit – III: Stocks: Common Stock Valuation, Preferred Stock Valuation, Stock Price Validity Hours: 6</p> <p>Unit – IV: Stock Price Models: Geometric Brownian Motion, Binomial Tree Hours: 6</p> <p>Unit – V: Options: Option Basics, Option Pricing Models, Option Trading Strategies Hours: 6</p>					
Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)		<p style="text-align: right;">Total Hours: 30</p> <p>Questions related to the above topics, from various competitive examinations UPSC / TNPSC / others to be solved (To be discussed during the Tutorial hour)</p>					

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Skills acquired from this course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill
Recommended Text	1. An Introduction to Mathematics of Finance: A Deterministic Approach by Stephen Garrett. 2. An Elementary Introduction to Mathematical Finance by Sheldon. M. Ross
Reference Books	1. Mathematics for Finance by M. Capinski and T. Zastawniak, Springer (International Edition), 2003 2. The Calculus of Finance by Amber Habib, Universities Pres, 2011 3. Options, Futures and Other Derivatives, 7 th Edition by John C. Hull and Sankarshan Basu, Pearson 2009 4. Investment Science by David Luenberger, Oxford University Press (Indian Edition), 1997
Website and e-Learning Source	1. https://ocw.mit.edu/courses/15-401-finance-theory-i-fall-2008/ 2. Investopedia Financial-Education: https://www.investopedia.com/financial-education-4689775 EC – Financial Mathematics 3. https://www.edx.org/course/financial-analysis-decision-making-0

Course Learning Outcome (for Mapping with POs and PSOs)

Students will be able to

CLO 1: Apply mathematical concepts and techniques to solve financial problems.

CLO 2: Analyse different types of financial instruments and evaluate their risks and returns.

CLO 3: Construct investment portfolios and manage risks.

CLO 4: Communicate business information effectively to stakeholders

CLO 5: Understand the ethical and professional standards in the finance industry.

	POs						PSOs		
	1	2	3	4	5	6	1	2	3
CLO 1	3	1	3	1	1	--	3	2	1
CLO 2	2	1	3	1	1	--	3	2	1
CLO 3	3	1	3	1	1	--	3	2	1
CLO 4	3	1	3	1	1	--	3	2	1
CLO 5	3	1	3	1	1	--	3	2	1