Shri Vile Parle Kelavani Mandal's

Dwarkadas J. Sanghvi College of Engineering

(Autonomous College Affiliated to the University of Mumbai)

Scheme and Detailed syllabus (DJS23)

of

Honors Degree Program

in

Computational Finance

(Semester III)

Revision: 2
With effect from the Academic Year: 2024-2025

Scheme for Undergraduate Program in Computer Science and Engineering (Data Science)
Honors in Computational Finance
(Academic Year 2024-2025)

Sr	Course Code	Course	Teaching Scheme				Semester End Assessment (A)						Continuous Assessment (B)			(A+B)	Total Credits
			TH	PR	TUT	Credits	Duration	TH	OR	PR	O & P	SEA Total	TH	TW	CA Total		
		SEM III															
1	DJS23DCH1301	Financial Market and Risk Analysis	3	-	-	3	2	60	-	-	-	60	40	-	40	100	3
		SEM IV															
2	DJS23DCH1401	Econometric Modelling	3	-	-	3	2	60	-	-	-	60	40	-	40	100	3
		SEM V															
3	DJS23DCH1501	Computational Methods and Pricing Models	3	-	-	3	2	60	-	-	-	60	40	-	40	100	4
4	DJS23DLH1501	Computational Methods and Pricing Models Laboratory	-	2	-	1	-	-	-	-	-	-	-	25	25	25	
		SEM VI															
5	DJS23DCH1601	Quantitative Portfolio Management	3	-	-	3	2	60	-	-	-	60	40	-	40	100	4
6	DJS23DLH1601	Quantitative Portfolio Management Laboratory	-	2	-	1	-	-	-	-	-	-	-	25	25	25	
		SEM VII															
7	DJS23DCH1701	Stochastic Calculus for Financial Modelling	3	-	-	3	2	60	-	-	-	60	40	-	40	100	4
8	DJS23DLH1701	Mini Project	-	2	-	1	-	-	-	-	-	-	-	50	50	50	
		Total	15	6	-	18	10	300	-	-	-	300	200	100	300	600	18

Prepared by   Checked by   Head of the Department   Principal

Honors in Computational Finance   **Semester: III**

Program: Computer Science and Engineering (Data Science)

Course: Financial Markets and Risk Analysis (DJS23DSHN1C1)

Pre-requisite:
1.   Basic Mathematics

Objectives:
1.   To provide an understanding of various financial institutions, their functions, as well as to introduce various financial instruments and their associated risks.
2.   Measurement, analysis and managing the risk using advanced techniques.
3.   To introduce risk exposure in money markets, capital markets, and forex markets.

Outcomes: On completion of the course, the learner will be able to:
1.   Understand the structures, functions, and operations of financial institutions and markets
2.   Identify and evaluate various financial instruments and assess the risks associated with them.
3.   Assess the risk in money markets, capital markets and forex markets.

**Financial Markets and Risk Analysis (DJS23DSHN1C1)**	
Unit	**Description**	**Duration**
1	**Introduction to Financial Instruments:** Money, equity, debt instruments, foreign exchange and their risk structure. Introduction to crypto currency (or contemporary currency)	06
2	**Money Market Instruments and Structure of Risk:** Interest rate and valuation: present value and future value computation, annuity valuation, loan amortization, capital recovery and sinking fund factory, money market instruments and structure of their risk and returns. **Equity Market and Risk Matrix:** Stocks, Ordinary and Preferential Stocks, primary and secondary stock market, initial public offering (IPO), public equity and private equity, stock market index, market participants, trading risk in equity market.	09
3	**Financial Markets and Products:** Structures and functions of financial institutions, structure and mechanics of over – the – counter (OTC) and exchange markets, Spot market, Commodity market, Foreign exchange market, Corporate bonds and mortgage-based-securities.	08
4	**Debt Market, Structure of Risk and Return:** Risk and Return of Debt instruments, types of bonds, term structure for interest rates, yield curve, spot rate and forward rate, duration and convexity of yield curve.	07
5	**International Finance:** Foreign exchange market, determination of foreign exchange rate, purchasing power parity theory, interest rate parity, Fisher effects, international Fisher effect. **Foreign Exchange Risk:** Currency derivatives, currency quotes, triangular currency arbitrage, exchange rate exposure.	09
	Total	**39**

Books Recommended:

Text books:

1. Jimmy Skoglund, Wei Chen, "Financial Risk Management", Wiley Publication, 2015.
2. Bharti. V. Pathak, "The Indian Financial System," Pearson Publication, 2018

Reference Books:

1. *Saunders. A. and Cornett M, "Financial Markets and Institutions, McGraw Hill Education, 2014.*
2. Hull. J. C," Options, Future and other Derivatives, PHL publication 2013.
3. Brealey, Myers, Allen, "Principals of Corporate Finance, McGraw Hill, 2020

Web Links:

1. Financial Instruments:
     https://corporatefinanceinstitute.com/resources/wealth-management/financial-instrument/
2. NPTEL course in Financial Institution and Markets: https://nptel.ac.in/courses/110105121

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