



Proposed scheme for Honors in Computational Finance
 (Academic Year 2022-2023)

Sr.	Course Code	Course	Teaching Scheme (hrs.)				Continuous Assessment (A) (marks)			Semester End Assessment (B) (marks)					(A+B)	Total Credits
			Th	P	T	Credits	Th	T/W	Total CA (A)	Th / Cb	O	P	O & P	Total SEA (B)		
Sem V																
1	DJ19DSHN1C1	Econometric Modelling	4	--	--	4	25	--	25	75	--	--	--	75	100	4
Sem VI																
2	DJ19DSHN1C2	Financial Market and Computing	4	--	--	4	25	--	25	75	--	--	--	75	100	4
	DJ19DSHN1L1	Financial Market and Computing Laboratory	--	2	--	1	--	25	25	--	--	--	--	--	25	1
Sem VII																
3	DJ19DSHN1C3	Quantitative Portfolio Management	4	--	--	4	25	--	25	75	--	--	--	75	100	4
4	DJ19DSHN1L2	Quantitative Portfolio Management Laboratory	--	2	--	1	--	25	25	--	--	--	--	--	25	1
Sem VIII																
5	DJ19DSHN1C4	Stochastic Calculus	4	--	--	4	25	--	25	75	--	--	--	75	100	4
		Total	16	4	0	18	100	50	150	300	0	0	0	300	450	18



Honors in Financial Market and Computing

Semester: VI

Program : Computer Science and Engineering (Data Science)

Course: Financial Market and Computing (DJ19DSHN1C2)

Pre-requisite:

1. Statistics for Data Science
2. Programming with Python

Objectives:

1. To provide an understanding on various financial institutions, their functions and risks associated to it.
2. Measurements and analysis of risk using advanced techniques.

Outcomes: On completion of the course, the learner will be able to:

1. Identify various financial instruments and risk associate with them.
2. Analyse applied risk and risk exposure.
3. Solve the measurement of money market, capital market and forex market risk.

Financial Markets and Computing (DJ19DSHN1C2)		
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)	08
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.	12
3	Financial Markets and Products: Structures and functions of financial institutions, structure and mechanics of over – the – counter (OTC) and exchange markets, Spot market, Foreign exchange market, Corporate bonds and mortgage-based-securities.	10
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.	10
5	International Finance: Foreign exchange market, determination of foreign exchange rate, purchasing power parity theory, interest rate parity, fishers effects, international fishers effects. Foreign Exchange Risk: Currency derivatives, currency quotes, triangular currency arbitrage, exchange rate exposure.	12
	Total	52

Books Recommended:*Text books:*

1. Jimmy Skoglund, Wei Chen, “Financial Risk Management”, Wiley Publication, 1st Edition, 2015.
2. Bharti. V. Pathak, “The Indian Financial System”, Pearson Publication, 5th Edition, 2018.

Reference Books:

1. Saunders. A and Cornett m. M, “Financial Markets and Institutions”, McGraw Hill Education, 1st Edition, 2014.
2. Hull. J. C, “Options, Future and other Derivatives”, PHL publication, 11th Edition, 2022.
3. Brealey, Myers, Allen, “Principals of Corporate Finance”, McGraw Hill, 12th Editon, 2018.

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>

Suggested List of Laboratory Experiments:

S No	Name of Experiment
	Data Sources: Yahoo Finance, Alpha Vantage, FXCM, OANDA, EOD Historical Data
1.	Analysis of Volume Data and Historical Price for one Stock.
2.	Implementation of time period specific setting.
3.	Build a model for a Frequency Setting.
4.	Implement financial model for Stocks Splits and Dividend Prediction.
5.	Build a model by Importing Stocks data for market analysis.
6.	Perform Dividend Indexes Analysis on specified data source.
7.	Implementation of Cryptocurrencies trading.
8.	Compare and analyze various Mutual Funds dataset and build a model.
9.	Analyze Financial Balance Sheet, Cashflows and P & L.
10.	Perform analysis by Streaming Real-Time Data.
11.	Build a model on Bonda Data in terms of Ratings, Historical Price and Yields.

Prepared by

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