GANPAT UNIVERSITY									
FACULTY OF MANAGEMENT STUDIES									
Programme	Bachelor of Business Administration				Branch / Spec.	Finance			
Semester	IV				Version	1.0.0.0			
Effective from Academic Year	2025-26				Effective for the Batch Admitted in	July 2024			
Subject Code	BFIN205	Subject Name			AI for Investment (Swayam)				
Teaching Scheme					Examination Scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	03	00	00	00	03	Theory	50	50	100
Hours	03	00	00	00	03	Practical	00	00	00

Pre-requisite:

Objective:

To equip students with financial market knowledge, AI/ML skills, and advanced time-series analysis for investment decisions, portfolio management, and algorithmic trading.

Learning Outcomes/Course Outcomes::

On successful completion of the course, the students will be able to:

CO1- Analyze risk and return, value firms, and make sound investment decisions.
CO2- Gain a foundational understanding of AI, machine learning models, and their applications.
CO3- Learn the basics of R programming and its use in financial analysis.
CO4- Construct, optimize, and manage portfolios, and evaluate their performance.

Mapping of PO-CO and PSO-CO:

Course Outcome (CO) No.	PO-CO Mapping								PSO-CO Mapping					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	2	1	3	1	2	3	3	2	3	3	2	2	2
CO2	2	2	1	2	1	1	2	2	1	2	2	2	1	1
CO3	2	2	1	2	1	1	3	2	1	2	2	2	1	1
CO4	2	2	1	3	1	2	3	3	2	3	3	2	2	2

Theory Syllabus

Unit	Content	Hrs.
1	Introduction to financial markets: Risk-Return Analysis in Investment Decisions – Measures of Risk and Return, understanding value of a firm, goals of a firm, cash flow discounting, making investment decisions, valuation of fixed income securities and common stocks, introduction to portfolio theory and asset pricing models, cost of capital. Overview of AI and machine learning model Introduction to R Programming, R Fundamentals. Market Microstructure and Liquidity: Order-driven vs. Quote-driven markets, Market efficiency, Risk preferences, Limit order books, market microstructure types, economic theory of choice, interest rate compounding Portfolio construction: Portfolio risk and expected returns for two securities and multiple securities, risk diversification with portfolios, correlation structure, mean-variance framework, portfolio construction with R Portfolio Optimization: Portfolio Possibility curve, Efficient frontier, Minimum Variance portfolios, Introduction to risk-free lending and borrowing, market risk and beta, portfolio optimization with R	20
2	Asset Pricing Models: Capital Asset Pricing Model (CAPM), Capital Market Line, Security Market Line, Fallings of CAPM, Single-Index and Multi-Index models, Expected Risk and Return with Index models, 3-Factor Fama-French Model Portfolio Management and Performance Evaluation: Portfolio Management strategies, Active vs Passive Portfolio Management, Value vs Growth investing, One-parameter performance measures Timing & Selection	25

	performance measures, application of asset pricing models in performance management Introduction to Algorithmic Trading: Technical analysis and trend determination, Dow Theory, Moving averages, Momentum indicators, Classical price patterns. AI and machine learning in Trading execution and portfolio management: Regression and Classification algorithm applications in security analysis, forecasting, and prediction, Case Study examples Advanced time-series regression algorithms: Panel regression quantile regression, ARMA/ARIMA models, Mean reverting trading strategies with vector error correction models and cointegration, model risk management, back testing, model validation, and stress testing with R Advanced time-series algorithms for financial risk-management: Value-at-risk, Expected Shortfall, ARCH/GARCH models, implementation with R	
	Exam: Theory 100%. Swayam Exam OR Uni Exam	
Text Book:		
	1. Machine Learning in Finance by M. Dixon, I Halperin, and P. Bilokon, Springer, 1st Edition 2. Advances in Financial Machine Learning, Marcos Lopez, Wiley, 1st Edition	
Reference Books:		
	• Machine Learning for Asset Managers, Marcos Lopez, Cambridge University Press, 1st Edition • Machine Learning for Algorithmic Trading, Stefan Jansen, 2nd Edition, Packt • Elton & Gruber, "Modern Portfolio Theory", Wiley, 9th Edition • Reilly, Frank,K., "Investment Analysis and Portfolio Management," 5th Edition, Dryden. • Bodie, Z., Kane, A., & Marcus, A. J. (2018). Investments (11th ed.). McGraw-Hill Education. • Hastie, T., Tibshirani, R., & Friedman, J. (2009). The elements of statistical learning: Data mining, inference, and prediction (2nd ed.). Springer • Ross, S. A., Westerfield, R. W., Jaffe, J., & Jordan, B. D. (2018). Corporate finance (11th ed.). McGraw-Hill Education. • Tsay, R. S. (2010). Analysis of financial time series (3rd ed.). John Wiley & Sons.	
Online Resource:		
	NPTEL Course (3 credits) in Jan Cycle (12 weeks) By Prof. Abhinava Tripathi by IIT Kanpur https://onlinecourses.nptel.ac.in/noc25_mg08/preview	