



Proposed scheme for Honors in FinTech in Artificial Intelligence and Machine Learning: Semester V (Autonomous)

Academic Year(2026-27)

Sr. No	Course Code	Course	Teaching Scheme			Continuous Assessment (A)						Semester End Examination (B)						Aggregate (A+B)	Credits
			Theory (hrs.)	Practical (hrs.)	Tutorial (hrs.)	Term Test 1(TT1) -a	Term Test 2(TT2) -b	Assg/CP/GD/Presentation/Quiz) -c	Total (a+b+c)	Term work	CA Total	Duration	Theory	Oral	Pract	Oral & Pract	SEE Total		
Sem III																			
1	DJS23AH2201	Foundation of Finance	3	--	--	15	15	10	40	--	40	2	60	--	--	--	60	100	3
Sem IV																			
2	DJS23AH2251	Quantitative Finance	3	--	--	15	15	10	40	--	40	2	60	--	--	--	60	100	3
Sem V																			
3	DJS23AH2301	Econometric Modelling and Financial Analytics	3	--	--	15	15	10	40	--	40	2	60	--	--	--	60	100	3
4	DJS23AH2301L	Econometric Modelling and Financial Analytics Laboratory	--	2	--	--	--	--	--	25	25	2	--	25	--	--	25	50	1
Sem VI																			
5	DJS23AH2351	Intelligent Trading Systems & Risk Analytics	3	--	--	15	15	10	40	--	40	2	60	--	--	--	60	100	3
6	DJS23AH2351L	Intelligent Trading Systems & Risk Analytics Laboratory	--	2	--	--	--	--	--	25	25	2	--	25	--	--	25	50	1
Sem VIII																			
7	DJS23AH2451	Decentralized Systems	4	--	--	15	15	10	40	--	40	2	60	--	--	--	60	100	4
Total			16	4	--	75	75	50	200	50	250	14	300	50	--	--	350	600	18

Prepared by

Checked by

HoD

Vice Principal

Principal

**Continuous Assessment (A):**

Course	Assessment Tools	Marks	Time (mins)
Theory	a. Term Test 1 (based on 40 % syllabus)	15	45
	b. Term Test 2 (on next 40 % syllabus)	15	45
	c. Assignment / course project / group discussion / presentation / quiz/ any other.	10	--
	Total marks (a + b + c)	40	
Audit course	Performance in the assignments / quiz / power point presentation / poster presentation / group project / any other tool.	--	As applicable
Laboratory	Performance in the laboratory and documentation.	25	
Tutorial	Performance in each tutorial & / assignment.	25	
Laboratory & Tutorial	Performance in the laboratory and tutorial.	50	

Continuous Assessment (B):

Course	Assessment Tools	Marks	Time (hrs.)
Theory / * Computer based	Written paper based on the entire syllabus.	60	2
	* Computer-based assessment in the college premises.		
Oral	Questions based on the entire syllabus.	25	As applicable
Practical	Performance of the practical assigned during the Examination and the output / results obtained.	25	2
Oral & Practical	Project based courses - Performance of the practical assigned during the examination and the output / results obtained. Based on the practical performed during the Examination and on the entire syllabus.	As per the scheme	2



Program: Artificial Intelligence and Machine Learning	T.Y.BTech	Semester: V
Course: Econometric Modeling and Financial Analysis (DJS23AH2301)		

Prerequisite: - Foundation of Finance, Quantitative Finance, Financial Market and Risk Analysis, Pricing Models.

Course Objectives:

To develop advance statistics skills for financial data analysis.

Course Outcomes:

1. Apply simple and multiple regression models for data analysis, while addressing violations of classical regression assumptions.
2. Analyse advanced econometric techniques for time series analysis to extract insights from economic data.
3. Evaluate practical econometric skills to solve real-world economic problems and apply theoretical knowledge to data analysis. Analyse risk and return metrics, and evaluate asset pricing using CAPM, APT, and multi-factor models.

Econometric Modeling and Financial Analysis (DJS23AH2301)		
Unit	Description	Duration
1.	Nature of Econometrics and Economic Data: Introduction to Econometrics, steps in Empirical Econometric Analysis, Structure of Economic Data: Cross-section data, Time-series data, Pooled Cross Sections and Panel or Longitudinal data. Causality and the Notion of Ceteris Paribus in Econometric Analysis.	5
2.	Simple Linear Regression Models: Two variable case, Regression Vs Correlation, Linearity Vs Non-collinearity, Stochastic specification: The significance of error term, Estimation: The principal of ordinary least squares; Assumptions under CLRM, BLUE properties of estimators; The Gauss Markov Theorem, Goodness of fit- R-squared; Tests of Hypotheses; Scaling and Units of measurement; Confidence Intervals; Forecasting. K variable linear regression model: estimation of parameters; Qualitative Independent variables-dummy variable trap.	9
3.	Multiple Regression Analysis and Diagnostics Tests: Multiple Regression Model, Analysis, Derivation of the parameters, Assumptions. Geometric Interpretation, Frisch-Waugh –Lovell Theorem, Derivation of Residual Variance.	8
4.	Violations of Classical Assumptions: Consequences, Detection and Remedy Heteroscedasticity: problem and Consequences; Tests, Detection and Alternative methods of estimation. Autocorrelation: Sources, Consequences, Tests of autocorrelation, Remedial measures.	8
5.	Multi collinearity Nature of the Problem: Sources, Perfect multi collinearity vs Imperfect multi collinearity, Its consequences; Detection and Remedies of multi collinearity.	6



6.	Time Series Econometrics: AR, MA, and ARMA processes. Modelling Trends and Seasonality, Linear Probability model, Introduction to Vector Autoregressive (VAR) models. Case Study: Use cases on Time Series Modelling	6
	TOTAL	42

Books Recommended:

Text books:

1. Jeffrey M. Wooldridge, "Introductory Econometrics," South-Western Cengage, 7th edition, 2022.
2. Lokesh Boro and Niranjana Das, "Introductory Econometrics," Bidya Bhawan, First Edition, 2021.
3. James H. Stock & Mark W. Watson, "Introduction to Econometrics," Pearson, 4th edition, 2019.

Reference Books:

1. Brooks, Chris, "Introductory Econometrics for Finance," Cambridge, 2019.
2. Damodar Gujarati, "Basic Econometrics," McGraw Hill, 2020.
3. Francis X. Diebold, "Elements of Forecasting," Cengage South-Western, 2019.
4. Kevin P. Murphy, "Probabilistic Machine Learning: An Introduction," MIT Press, 2022.

Web Links:

Online Courses:

Coursera:

1. <https://www.coursera.org/learn/econometrics-1>
2. <https://www.coursera.org/learn/erasmus-econometrics>

NPTEL:

3. <https://nptel.ac.in/courses/106101578>
4. <https://nptel.ac.in/courses/130106001>

Dataset Links:

<https://justinmshea.github.io/wooldridge/>
<https://econometrics.com/comdata/wooldridge/>
<https://finance.yahoo.com/>
<https://data.worldbank.org/>
<https://fred.stlouisfed.org/>
<https://econpapers.repec.org/paper/bocbocins/>

Suggested List of Experiments

Econometric Modelling and Financial Analysis Laboratory (DJS23AH2301L)	
Sr No	Title of the Experiment
1	i. Understanding Economic Data Types: Identify and classify datasets into cross-section, time-series, and panel data using real datasets ii. Exploratory Data Analysis (EDA) for Financial Data: Perform summary statistics, visualization, correlation analysis using financial datasets



2	Simple Linear Regression Implementation: Implement two-variable regression using OLS and interpret coefficients
3	Hypothesis Testing in Regression: Perform t-tests, F-tests, confidence intervals for regression coefficients
4	Regression vs Correlation Analysis: Compare correlation and regression using datasets and interpret differences
5	i. Multiple Linear Regression Model ii. Dummy Variables in Regression: Implement regression with categorical variables and analyze dummy variable trap
6	Analyze residuals, check normality, homoscedasticity visually
7	Heteroscedasticity Detection & Correction: Apply Breusch-Pagan test and use robust standard errors
8	Autocorrelation Detection & Remedies: Use Durbin-Watson test and apply corrections
9	Multicollinearity Detection & Remedies: Use VIF (Variance Inflation Factor) and correlation matrix to detect multicollinearity and Apply techniques like variable selection, PCA, or ridge regression
10	Trend and Seasonality Analysis: Decompose time series into trend, seasonal, and residual components
11	Time Series Modeling: Build and analyze AR, MA, ARMA models using financial time-series data
12	Linear Probability Model (LPM): Implement LPM for binary dependent variables and interpret limitations
13	Vector Autoregression (VAR) Model: Build a VAR model for multivariate time series (e.g., GDP, inflation) and analyze interdependencies
14	Event Impact Analysis on Financial Data: Analyze impact of events (e.g., policy change, earnings announcement) using regression or time-series methods

Minimum ten experiments from the above suggested list or any other experiment based on syllabus will be included, which would help the learner to apply the concept learnt

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