Course Code. :	**HS 217001**
Course Title :	**Introduction to Computational Finance and Financial Econometrics**
Credits:	L T P C 3 0 0 4
Prerequisites (if any)	Completed introductory course in Finance, Statistics and Mathematics
Course Coordinators	Dr.Pravin Jadhav

Course description and contents:

The course focuses on the computational finance using basic concept of econometrics. Particular attention is paid to the financial theory and its application to real-world problems and estimating it using statistics and econometrics, and to the interpretation of the estimation results. The first part of the course includes a review on statistics. The second part of the course focuses on issues in linear regressions including model misspecification, measurement errors, and endogenous repressor and different financial models and theories. Topics typically include instrumental variable regressions and panel data. The course will include the use of R, Eviews ,Excel etc, a standard software for econometric and statistical analysis.

Course Objectives

1. To familiarize students with basic concept of econometrics, model building and estimation for analyzing financial models.
2. To teach the students various econometrics tools and their application.
3. To apply econometric techniques in financial decision-making.

Evaluation scheme for the course

Assignments – 05

Class tests/ Quizzes – 05

Projects - 15

Mid semester examination – 25

End semester examination – 25

Course Content

Module I: Review of Statistics and Mathematics (4 hrs)

Standard deviation, Variance, Probability, Probability distribution, Sampling, Sampling distribution, Hypothesis testing; Correlation and Covariance, Correlation and Regression; Properties of summation, Mathematical expectation, linear function, Logarithmic function, Basics of differential calculus, Partial differentiation; What is econometrics? Why a separate discipline? Terminology and Notation; Goals and Methodology of econometrics; Statistical versus Deterministic Model; The Nature and Sources of Data for Economic Analysis, Measurement scales for different type of data.

Module II: Simple Linear Regression Model (4 hrs)

Two Variable Regression Analysis: Basic Ideas; Estimation and Hypothesis testing of Two Variable Regression Model; Assumptions of the method of least squares for Classical Linear Regression Model; Standard error of the least square estimates; Gauss Markov Theorem; Coefficient of Determination

Module III: Extensions of Simple Regression Model (6 hrs)

Regression through the Origin; Scaling and Units of Measurement; Functional Forms of Regression Models; How to measure elasticity: The log-Linear Model; Choice of Functional Forms; Linear trend and Non-Linear Trend Model

Module IV: Multiple Linear Regression Model (6 hrs)

The Three-Variable Model: Notation and Assumptions; Estimation and Interpretation of Multiple Regression Coefficients; The meaning of Partial Regression Coefficients
The Multiple Coefficient of Determination R^2 and the Multiple Coefficient of Correlation R; R^2 and Adjusted $R^{2;}$ Hypothesis testing about individual regression coefficients; Testing the Overall Significance of the Sample Regression; Testing the Equality of Two Regression Coefficients

Module V: Dummy Variable Regression Model (6 hrs)

The nature of Dummy Variables; The use of Dummy Variables in Seasonal Analysis. Interaction effects using dummy variables.

Module VI: Relaxing the Assumptions of the Classical Model (OLS) (6 hrs)

Multicollinearity ; Heteroscedasticity; Autocorrelation

Module VII: Application of Econometrics in Financial Modelling (8 hrs)

Computing asset returns; The constant expected return model; Monte Carlo simulation, standard errors of estimates, confidence intervals, bootstrapping standard errors and confidence intervals, hypothesis testing, Maximum likelihood estimation, review of unconstrained optimization methods; Introduction to portfolio theory, Portfolio theory with matrix algebra; Review of constrained optimization methods, Markowitz algorithm, Markowitz Algorithm using the solver and matrix algebra; Statistical Analysis of Efficient Portfolios; Risk budgeting, Euler's theorem, asset contributions to volatility, beta as a measure of portfolio risk; The Single Index Model, Estimation using simple linear regression

SUGGESTED READINGS:

TEXT BOOKS:

- Linto Oliver (2019), Financial Econometrics: Models and Methods, Cambridge University press
- Gujarati, D. N. (2013), Basic Econometrics, New Delhi: Tata McGraw-Hill, Fourth Edition.
- Gujarati, D. N. , Porter D C, and Gunasekar S. (2012), Basic Econometrics, New Delhi: Tata McGraw-Hill, Fifth Edition.
- Gujarati, D. N. (2006), Essentials of Econometrics, Tata McGraw-Hill, 3rd Edition.
- Salvatore, D. and Reagle, B. (2002), Statistics and Econometrics, Second edn., Schaum Outline Series

REFERENCE BOOKS

a) *Theory of Econometrics*, A. Koutsoyiannis, Palgrave, 1971

b) *An Introduction to Econometrics*, G. S. Maddala, John Wiley and Sons Ltd, 2001.

c) Econometric Methods, Johnston,J. (1991), Tata McGraw-Hill, 3rd Edition.

Course Code. :	**HS 217002**
Course Title :	**Financial Management**
Credits:	L T P C 3 0 0 4
Prerequisites (if any)	Completed introductory course in Finance, Statistics and Mathematics
Course Coordinators	Dr.Pravin Jadhav

Course Description:

The main objective of Financial Management is to acquire and develop skills to take rational decisions in the process of Financing mix and assessment of Price Earnings Ratio. Wealth maximizations have always been regarded as important in financial analysis in organizations.

Leverage aspects are critical in each aspects of management and equally so for the effective management of Financial Resources. In view of Cost of Capital has assumed great importance. This course is designed primarily for students who are being exposed to capital structure, Cost of Capital, Working Capital for the first time.

This course covers the explanations about the Financial Management concepts in the organizational context, it details the impact of Source of Funding, EBIT EPS, PAT on Financial Statement. The course also focuses on understanding of identification of Financing Cost and framing of strategies and scenarios required to select and develop product line.

Course Objective

- To understand the importance of Financial Management in corporate valuation
- To describe how people, analyze the corporate leverage under different conditions and understand why people valuate different corporates in different manner.
- To synthesize related information and evaluate options for most logical and optimal solution such that it would be able to predict and control Debt Equity incurrence and improve results.

Evaluation scheme for the course

Assignments – 10

Class tests/ Quizzes – 10

Projects - 5

Mid semester examination – 25

End semester examination – 50

Course Content

Module – I Introduction to Finance, Time Value of Money (7 hrs)
Role of Finance Function, Principles of Financial Management, Scope, Rationale, Techniques, Practical Applications of Compounding and Present Value Techniques

Module – II Capital Budgeting (7 hrs)
Major Capital Budgeting Decisions – Concepts of Cash Flows and Cash Flow Patterns, Capital Budgeting Techniques & Limitations – Traditional (ARR, Payback Period) and modern (NPV IRR, TVM and Profitability Index); NPV Vs PI – Comparison, Economic Value Added

Module – III Cost of Capital (7 hrs)
Concept, Explicit and Implicit Costs, Cost of Debt – Redeemable and Perpetual, Cost of Preference Shares – Redeemable and non-redeemable, Cost Equity – Dividend and CAPM Approach, Cost of Retained Earnings Overall Cost of Capital (WACC) – Assignment of Weights (Historical and Market)

Module – IV Financing Decision (7 hrs)
Operating , Financial and combined Leverage – Algebraic and Graphic Approach , EBIT – EPS (Indifference Curve) Analysis ,Capital Structure – Concept, theories of relevance and irrelevance Net Income/Net Operating Income Approach, Modigliani – Millar Hypothesis , Traditional Approach Optimum Capital Structure – factors and determinants

Module – V Management Of Profits (7 hrs)
Concept and Forms of Dividend, Determinants of Dividend policy Dividend Theories of relevance (Walter and Gordon) and irrelevance (Miller-Modigliani), and Limitations, EVA, MVA.

Module – VI Introduction to Working Capital and Domain Industry Finance (5 hrs)
Concept, Definition Need, Types an determinants of working Capital, Estimation & Financial Working Capital International Business Financial Management

TEXT BOOKS

1.Pandey , I.M,(2015), *"Financial Management*", 11th Edition,Vikas Publication, New Delhi.

2.Sinha, Pradeep Kumar, (2009) *, "Financial Management*", 5th Edition, The World Press, Calcutta.

REFERENCE BOOKS

1. Chandra, Prasanna, (2011)*, "Financial Management Theory and Practice*", 8th Edition, TMH, New Delhi.
2. Vanhorne, J, (2015)*," Financial Management & Policy"*, 13th Edition, Pearson Education, Delhi.
3. Brealey and Myers, (2017)*," Principles of Corporate Finance*", 10th Edition , McGraw Hill, India.

Course Code. :	**HS 217003**
Course Title :	**Sustainable Finance**
Credits:	L T P C 3 0 0 4
Prerequisites (if any)	Completed introductory course in Finance
Course Coordinators	Dr.Pravin Jadhav

Course Description:

The main objective of the course is to understand the concept of Sustainable Finance. It helps ensure that investments support a resilient economy and a sustainable. A sustainable financial centre is a financial marketplace that, as a whole, contributes to sustainable development and value creation in economic, environmental and social terms. In other words, one that ensures and improves economic efficiency, prosperity, and economic competitiveness both today and in the long-term, while contributing to protecting and restoring ecological systems, and enhancing cultural diversity and social well-being.

Course Objective:

1. Describe, understand and discuss current developments and trends in the area of sustainable finance;
2. Distinguish between different types of sustainable finance products and relevant eligibility criteria;
3. Discuss opportunities, challenges, and enabling conditions for countries to benefit from growing sustainable investment opportunities;
4. Identify opportunities for the public and private sectors to issue green bonds and green loans;
5. Apply sustainable finance mechanisms to a real-life investment case study.

Evaluation scheme for the course

Assignments – 10

Class tests/ Quizzes – 10

Projects - 5

Mid semester examination – 25

End semester examination – 50

Course Content:

Module 1: Fundamentals of Sustainable Finance Module

What is Sustainable Finance? Sustainable Finance and International Agreements, Incorporating Sustainability into Organizations and the Financial System, Introduction to Environmental, Social and Governance (ESG) Risk Management, Key Challenges for Sustainable Finance

Module 2: Sustainable Finance Market

The Five Pillars of Sustainable Finance Concept, An Overview of Sustainable Finance Market Participants, Sustainable Finance: Policies and Regulation, Impact Reporting and Communication

Module 3: Sustainable Finance Products: Green Bonds and Green Loans

Sustainable Finance Products, The Green Bond Market, The Green Loan Market, Green Bond Projects around the World: Examples

Text Books:

Principles of sustainable finance by Dirk Schoenmaker and Willem Schramade, Kindle edition, Oxford, Oxford University Press,

References:

teckel, Jan Christoph, Michael Jakob, Christian Flachsland, Ulrike Kornek, Kai Lessmann and Ottmar Edenhofer. 2017. “From climate finance toward sustainable development finance. ” WIRE Climate Change 8 (1). doi: 10.1002/wcc.437.

Fostering sustainable global growth through green finance – what role for the G20? https://www.g20-insights.org/wp-content/uploads/2017/04/Climate_Green-Finance_V2.pdf