DISCIPLINE SPECIFIC CORE COURSE – 20 (DSC-20): TIME SERIES ECONOMETRICS

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical		
Time Series Econometrics (DSC 20)	**4**	**3**	**0**	**1**	**Class 12**	**None**

Learning Objectives

The course aims:

- To develop a comprehensive set of tools and techniques for analyzing various forms of univariate and multivariate time series.
- To learn the skills needed to do empirical research in fields operating with time series data sets.
- To apply key concepts of estimation and forecasting in a time series context.
- To illustrate the theoretical results using software's like SPSS and R to estimate time series models

Learning outcomes

By studying this course, the students will be able to:

- To apply ideas to real time series data and interpret outcomes of analyses
- To demonstrate advanced understanding of the concepts of time series and their application to health, climate, finance and other areas.
- To select an appropriate regression model to analyze a given time-series economic data set, and then conduct forecasting and statistical inference and interpret the results.
- To present their understanding of certain economic problems, and use empirical results to justify their explanation.

SYLLABUS OF DSC-20

Unit 1 **(9 hours)**

Introduction to time series: Exploring time series data patterns; Exploring data patterns with autocorrelation analysis; Decomposition of time series; Choosing a forecasting technique; Measuring Forecasting Error.

Unit 2 **(9 hours)**

Moving Averages and Smoothing Methods: Naïve Models: Forecasting based on averages; Exponential Smoothing Methods; Seasonally adjusting data.

Unit 3 **(9 hours)**

Properties of Stochastic Time Series: Autocorrelation function; Stationarity; Random Walk; Testing for stationarity (unit root tests); Co-integrated Time Series.

Unit 4 **(9 hours)**

Linear Time Series: Moving Average models; Autoregressive Models; Box-Jenkins methodology; Mixed autoregressive and moving average (ARMA) models. Forecasting with ARMA/ARIMA models; properties of ARIMA forecasts.

Unit 5 **(9 hours)**

Regression with time series data; Conditional and Unconditional forecasting; Testing for causality; Vector Autoregressive (VAR) Models.

Practical Component (15 practical sessions; total 30 Hours): Practical to be based on econometrics packages such as Python/Eviews/R/Stata. The student is expected to conduct an end-to-end modelling journey which involves analyzing time ordered data, test for stationarity, forcasting and residual diagnostics for model validation. An econometrics-based project to be taken up to constitute the end-term practical examination.

Essential/recommended readings

1. Hanke, John E. and Dean W. Wichern (2005). Business Forecasting. 8th Edn. New Delhi: Pearson-Prentice Hall.

2. Makridakis, Spyros, Steven C. Wheelwright and Rob J. Hyndman (1998). Forecasting: Methods and Applications. 3rd Edn. USA: John Wiley and Sons.

Suggestive readings

1. Asteriou, D and Hall, S.G. Applied Econometrics, (4th Edition). Red Globe Press

2. Stock, J. and Watson, M. Introduction to Econometrics (4th edition) Pearson

DISCIPLINE SPECIFIC ELECTIVE COURSE 14 (DSE-14): FINANCIAL RISK MANAGEMENT

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
Financial Risk Management (DSE 14)	**4**	**3**	**1**	**0**	**Class 12**	**None**

Learning Objectives

The course aims at:

- To understand various types of financial risks (market, credit, liquidity, operational, etc.) faced by business and financial institutions.
- To learn necessary tools to measure, quantify, and assess financial risks using both qualitative and quantitative techniques.
- To develop, design and implement effective risk management strategies, including the use of financial instruments such as derivatives, hedging, and diversification.
- To apply theoretical knowledge to real-world financial risk scenarios, enabling them to make informed decisions in dynamic market environments.

Learning outcomes

By studying this course, the students will be able to:

- To identify different types of financial risks (market, credit, liquidity, operational) and understand their potential impact on businesses and markets.
- Develop proficiency in using various risk measurement tools and models to quantify financial risk exposure.
- Assess and implement strategies for mitigating financial risks, such as diversification, hedging, insurance, and the use of financial derivatives.
- Make informed and well-structured risk management decisions in real-world contexts, applying their knowledge to optimize financial stability and performance.

SYLLABUS OF DSE-14

Unit 1: Risk Incorporation in Projects **(15 hours)**

Inflation adjustment and Adjusted Cost of Capital. Conventional Risk Handling techniques in Capital Budgeting: Sensitivity Analysis, Risk Adjusted Discount Rate, Certainty Equivalent, Simulation. Statistical Techniques to handle risk in Capital Budgeting: Standard Deviation, Coefficient of Variation, Probability Distribution *(Cash Flows are independent, fully dependent and partially dependent on other cash flows)*, Decision Trees.

Unit 2: Risk Management in Derivatives **(12 hours)**

Meaning and Types, Stock Futures, Forwards & Options, Commodity Futures, Weather Derivatives, Hedging/Risk Management through stock futures and payoffs, Stock Options: In the money, At the Money and Out of Money, Payoffs under Stock Options Margin Adjustment for futures., Intrinsic Value, Simple Stock, Futures and Options Combination Strategies (Neutralizing the risk, Spread, Straddle, Collars, Covered call). Interest Rate Swaps

Unit 3: Risk Management through Pricing of Derivatives (9 hours)

Pricing of Forwards, Option Pricing using Binomial Model and Black Scholes Model, Put Call Parity Equation, Option Greeks: Meaning and Order of Greeks, Delta of European Stock Options, Delta and Black Scholes Model, Delta Hedging. Sensitivity of an Option: Vega, Theta , Rho & Lamda. Hedging through Gamma & Vega, Making a Portfolio Gamma Neutral, Gamma's relation with other Greeks.

Unit 4: Credit Rating and Risk Management in Insurance (9 hours)

Credit Rating: Credit rating in the banking sector, questionnaire method, 'Z' Score, Sensitivity and Transition Probability Matrix, CIBIL. Insurance : Premium Determination for Life : Endowment and Term Policies and Non Life Policies, Use of Mortality Tables

References

1. Hull. J.C & Basu S., Futures Options and Other Derivatives. Pearson Education
2. Parameswaran, S., Futures and Options. Tata McGraw Hill.
3. Vohra, N.D. & Bagri, B.R., Futures and Options, Tata McGraw-Hill.
4. Bodie, Zvi., Kane, Alex & Marcus, Alan J., Investments, McGraw Hill.
5. Rustagi, R.P., Investment Management. Sultan Chand & Sons.
6. Benninga, Simon, Financial Modelling with Excel, MIT Press
7. Financial management, R .P Rustagi, McGraw Hill

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

DISCIPLINE SPECIFIC ELECTIVE COURSE 4 (DSE-4): INTERNATIONAL FINANCIAL MANAGEMENT

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
International Financial Management (DSE 6)	4	3	1	0	Class XII	None

Learning Objectives

This course aims at inculcating an understanding of:

- Key features of international finance and foreign exchange markets.
- Theories of International finance that link exchange rates with interest rates and inflation rates in different countries.
- Evolution of exchange rate system in the international financial markets.
- Determination of exchange rate, types of foreign exchange risks and risk management strategies.

Learning outcomes

By studying this course, the students will be able to:

- Gain substantive knowledge of International Financial Management.
- Understand the principles of trading in foreign exchange markets, different instruments traded, risks involved and how to carry out hedging of currency risks.
- Learn how to compute forward rates using cross rates, computation of synthetic quotes and apply rules to determine existence of arbitrage amongst currencies traded.
- Understand how the international markets have evolved and the alternate exchange rate systems world has seen over the years

SYLLABUS OF DSE-6

Unit 1: Introduction To Currency Markets (12 hours)

Spot &Forex market: Introduction and Features, Participants, & their method of communication in forex markets, SWIFT and CHIPS. Currency Quotes and types, Calculation of forward rates using spot rates, Discount/Premium on spot rate, Swap Points and Outright Forward Rates, Forward Rate vs. Expected Future spot rates, Spot rate with and without transaction costs, Payoff Profiles on Forward Exchange, Currency futures and

Pay of Profiles, Mark to Market, Cross Rates & Synthetic quotes. Arbitrage: one point, two point and three point (triangular) arbitrage.

Unit 2: Parity Conditions in Currency Markets (12 hours)
Purchasing Power Parity (both absolute and relative versions), Interest Rate Parity (explanation of borrowing and lending criteria, diagrammatic presentation) , covered interest rate parity, International Fischer Effect. The linkages between parity conditions.

Unit 3: Alternate Exchange Rate Systems and Payment Terms (9 hours)

Gold Standard and Gold Exchange Standard System with price adjustment mechanism , EMS and its price adjustment, Hybrid systems , Fixed vs Flexible System, Overview on Brettonwoods System, IMF, SDR, Triffon Paradox & Smithsonian Agreement. Payment Terms and Methods of Financing International Trade (Letter of Credit, Forfaiting, Factoring, Credit Lines)

Unit 4: Exchange Rate Determination and Exposures (12 hours)

Currency Demand and Supply Curves, Stability of exchange rates and 'J' Curve Effect, Factors Affecting Exchange Rate, Foreign Exchange Exposure: Nature, Definition, Exposure Line and Interpretating Exposure, Statistical Measurement of Exposure, Types of Exposure (Meaning): Transaction, Economic and Translation Exposure, Hedging Strategies to Manage Transaction Exposures. Currency Swaps.

Essential/recommended readings

1. Apte, P G., Multinational Financial Management.Tata-McGraw Hill. New Delhi.
2. Levi, Maurice. International Finance. McGraw Hill Inc. New York.
3. Madura, Jeff. International Financial Management.South Western Cengage Learning.
4. Seth, A.K., International Financial Management. Galgotia Publishing Company. New Delhi.
5. Shapiro, Allen C., Multinational Financial Management. Prentice Hall India Pvt Ltd. New Delhi.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

GENERIC ELECTIVES (GE-8): ENVIRONMENTAL ECONOMICS AND

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Environmental Economics and Climate Change (GE-8)	4	3	1	0	Class 12	None

Learning Objectives

This course aims at inculcating an understanding of:

- How economic activities are affecting the environment.
- Social value of environmental resources.
- Climate change and its consequences.
- Efficient and effective policy measures for protecting the environment.

Learning outcomes

By studying this course, students will be able to:

. · Understand the linkage between environment and economics.

· Learn the basic theories of environmental economics.

· Understand the basic terminologies related to environment and Climate change.

· Analyse the effects of climate change on India and its future plan for environmental protection and mitigation.

SYLLABUS OF GE-8

UNIT – I: Introduction **(8 hours)**

Introduction to Environmental Economics, Material Balance model- economy environmental interactions, reasons for environmental degradation (population, technology, GDP), balance between environment and growth.

Unit 2: Economic Growth and Environmental Degradation **(10 hours)**

Theories of relationship between economic growth and environmental degradation: The environmental Kuznets curve hypothesis, The Brundtland Curve hypothesis, The environment Daly Curve hypothesis.

Unit 3: Climate Change and its Challenges **(15 hours)**

Introduction to the Climate Change, Drivers of Climate Change, Global impacts of Climate Change: Anthropogenic, Global warming, ozone hole, biodiversity loss, ecosystem services, natural capital and resources. Effect of Climate Change on India: Agriculture, Biodiversity, vulnerability of Coastal Belt, Rural Livelihoods and Food Security in India.

Unit 4: Actions Taken and Policy Framework (12 hours)

Global Level: Adaptation and Mitigation, Governmental and Intergovernmental Actions to Combat Climate Change: The Role of the Intergovernmental Panel on Climate Change (IPCC), United Nations Framework Convention on Climate Change, The Kyoto Protocol, Paris Agreement etc. The global carbon market (CDM, JI, ET).India's Position on International Climate Negotiations, India's National Action Plan on Climate Change.

Essential/recommended readings

1. Callen,Thomas (2007). Environmental Economics, Thomson Learning Inc. Indian Edition.
2. Dubash, Navroz (2012). Handbook of Climate Change and India: Development, Politics and Governance, Earthscan
3. Bhattacharya, R. N. (ed.) (2001). Environmental Economics, An Indian Perspective, Oxford University Press.

Suggestive readings

1. Romm, J.J. 2018. Climate change: What Everyone Needs to Know. Oxford University Press
2. Dash. S.K. 2008. Climate Change, Cambridge University Press

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

GENERIC ELECTIVES (GE-10): INDIAN FINANCIAL SYSTEM

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Indian Financial System (GE10)	**4**	**3**	**1**	**0**	**Class 12**	**None**

Learning Objectives

The course attempts to develop an understanding of:
(i) the history and role of the Indian Financial System in economic development
(ii) the role and importance of financial markets; capital, equity and money markets
(iii) commercial banks, development banks, NBFCs - risk and NPAs; role of ARCs.
(iv) role of financial services in credit market

Learning outcomes

By studying this course, students will be able to:

. Analyse the financial market processes and their factors, and make successful financial decisions at an individual as well as company level.

· Evaluate various ways of raising funds from the financial markets domestically or internationally for the company.

· Study the considerations of banking and other financial institutions in real life.

· Evaluate various financial services offered under financial system of India.

SYLLABUS OF GE-10

UNIT – I: Financial System: An Introduction (6 hours)

Financial System: meaning, characteristics, significance and components; tracing the history of the Indian financial system and its contribution to Economic Development; markets, regulators and participants in the Indian financial system; financial instruments, direct and indirect finance, scams in Indian Financial System.

Unit 2: Financial Markets (18 hours)

Financial Markets – meaning, types, role, importance, and securities traded; linkages between financial markets and economy. Capital market – meaning, functions, organisation; Equity market – primary and secondary market, ways of raising funds, private equity, venture capital, introduction to debt market. Money market – meaning, functions, organisation, participants, instruments, trading mechanism, role of central bank.

Unit 3: Financial Institutions (9 hours)

Commercial Banking, Nationalisation of Commercial Banks, Structure of Commercial Banks in India, Depository and Non-Depository Institutions, Universal Banking, Payments Bank, Development Banks (IFCI, IDBI, NABARD and NHB), NBFCs, Risk Management in Banks, ARCs Problem of NPAs.

Unit 4: Financial Services (12 hours)

Credit Rating – Meaning, Process, Rating Methodology, Rating Symbols and Rating Agencies.
Insurance – Meaning, Importance, Types, Seven Principles and Regulation.
Leasing – Meaning, Features and Types of Leasing; Concept of Hire Purchase, Difference between Hire Purchase and Leasing; Factoring – Meaning, Functions, Types and Procedure; Forfaiting – Meaning, Process, Characteristics, Types, Advantages, Difference between Forfaiting and Factoring; Investment Banking – Meaning, Importance and Services Offered by Investment Bankers.

Essential/recommended readings

1 Khan, M.Y. Indian Financial System. Tata McGraw Hill.

2. Bhole, L.M. Financial Institutions and Markets. Tata McGraw Hill.

3. Varshney, P.N. and Mittal, D.K. Indian Financial System. Sultan Chand & Sons.

4. Pathak, Bharati. Indian Financial System. Pearson Publications.

5. Shahani, Rakesh. Financial Markets in India: A Research Initiative. Anamica Publishing Co.

Suggestive readings

1. Gordon, E. &Natarajan, K. Financial Markets and Services. Himalaya Publishing House.

2. Gupta, Shashi, Aggarwal, Nisha and Gupta, Neeti. Indian Financial System.Kalyani Publishers.

3. Kumar, Vinod., Gupta, Atul. andKaur, Manmeet. Financial Markets, Institutions and Services, Taxmann Publications.

4. Madura, Jeff. Financial Markets and Institutions. South Western Cengage Learning.

***Note:** Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.*