

**Annexure – 2-C**

**Courses of Studies  
(Under CBCS)**

**For M.A./M.Sc. Programme in Economics**

(Syllabus of Courses Effective from the Academic Year: 2022-23)



**PARISHKAR COLLEGE OF GLOBAL  
EXCELLENCE  
AUTONOMOUS**

**Faculty Members**

**Dr. Sunita Sharma**

**Ms. Aneesha Jain**

# Master of Arts/Science

## SEMESTER-I

NATURE OF COURSE	COURSE TITLE
CORE	Microeconomic Analysis
CORE	Macroeconomic Analysis
CORE	Mathematical Economics-I
CORE	Statistical Methods Using Computer Application
ELECTIVE	<ul style="list-style-type: none"> <li>• Environmental Economics</li> <li>• Financial Economics-I</li> </ul>

## SEMESTER-II

NATURE OF COURSE	COURSE TITLE
CORE	Advance Microeconomic Analysis
CORE	Advance Macroeconomic Analysis
CORE	Introductory Econometrics
CORE	Mathematical Economics –II
ELECTIVE (Any One)	<ul style="list-style-type: none"> <li>• Mathematical Statistics</li> <li>• Financial Economics-II</li> <li>• Research Methodology</li> </ul>
Certification In (Any One)	<ul style="list-style-type: none"> <li>• Banking Sector</li> <li>• Currency And Commodities</li> <li>• Investment Analysis And Portfolio Management</li> </ul>

## SEMESTER-III

NATURE OF COURSE	COURSE TITLE
CORE	International Trade & Finance-I
CORE	Economics Growth And Development-I
CORE	Public Economics-I
CORE	Indian Economy
ELECTIVE (Any One)	<ul style="list-style-type: none"> <li>• Rajasthan Economy</li> <li>• Education and Health Economics-I</li> <li>• History Of Economic Thoughts</li> <li>• Advance Econometrics</li> </ul>

## SEMESTER-IV

NATURE OF COURSE	COURSE TITLE
CORE	International Trade & Finance-II
CORE	Economic Growth And Development-II
CORE	Public Economics-II
CORE	Dissertation
ELECTIVE (Any One)	<ul style="list-style-type: none"> <li>• Education and Health Economics-II</li> <li>• Labor Economics</li> <li>• Financial Economics-II</li> <li>• Agriculture Economics</li> <li>• Demography</li> </ul>

# **SEMESTER-I**

## **MICROECONOMIC ANALYSIS**

### **MODULE-I: THEORY OF CONSUMPTION**

Cardinal Utility Approach - Law of Diminishing Marginal Utility, Equi-Marginal Utility, Ordinal Utility Approach - Indifference curve properties, Consumer's equilibrium, Price, income & substitution effects, Derivation of Demand Curve. Revealed Preference Theory of Demand. Recent Development in Demand Theory - Hicksian Revised Theory, Consumer's Choice under Risk and Uncertainty. Consumer Surplus, Marshall's Measurement of Consumer Surplus, Measurement of Consumer Surplus through indifference Curve analysis, Elasticity of Demand. Duality indirect utility function and expenditure function. Network externalities- Snob effect, Bandwagon effect and Veblen effect.

### **MODULE-II: THEORY OF PRODUCTION, COST AND REVENUE**

Economies of Scale; Internal Economies and Diseconomies, External Economies and Diseconomies. Production Possibility Curve. Production Function, Law of Variable Proportions, Returns to Scale. Isoquants - Properties, Producer's equilibrium, Expansion Path, Elasticity of substitution. Euler's theorem; Linear Homogenous Production Function, Cobb-Douglas, Translog & CES production functions; Concepts & Derivations of Short Run and Long Run Cost Curves. AC & MC Relationship, Revenue Concepts-AR, MR and TR, Revenue and cost relationships. Duality and the cost function. Measures of productive efficiency of firms, Technical and allocative efficiency.

### **MODULE-III: PERFECT COMPETITION, MONOPOLY AND MONOPOLISTIC COMPETITION**

Perfect Competition; Price Determination, Equilibrium of the Firm and Industry. Monopoly - Price and Output Determination. Comparison between Monopoly equilibrium and Perfect Competition Equilibrium, Discriminating Monopoly-Price Discrimination, Equilibrium under Discriminating Monopoly. Bilateral Monopoly and Monopsony. Sources of Monopoly, Regulation of Monopoly-Through Taxation, and Price Regulation, Monopolistic Competition - Price and Output Determination. Critique of Chamberlin's Theory of Monopolistic Competition. Excess Capacity under Monopolistic Competition. Marginal cost pricing, peak load pricing

## **MODULE-IV: ALTERNATIVE THEORIES OF THE FIRM**

Critical evaluation of marginal analysis; Baumol's Model of Sales Revenue Maximization. Williamson's Managerial Model managerial discretion. Full cost pricing rule. Bain's limit pricing theory and its recent developments.

### **READING LIST**

1. Layard, P.R.G. and A.W. Walters (1979), Microeconomic Theory, McGraw Hill.
2. James M. Henderson and Richard E. Quandt, Microeconomic Theory- A Mathematical Approach, McGraw Hill Book Co.
3. Baumol, W. J. (1982), Economic Theory and Operations Analysis, Prentice Hall of India, Delhi.
4. Koutsoyiannis, A. (1979), Modern Microeconomics, (2<sup>nd</sup> Edition), Macmillan Press, London.
5. Varian, H. R. (2010) Intermediate Microeconomics: A Modern Approach.
6. Sen, A. (1999) Microeconomics: Theory and Application, Oxford University Press, New Delhi.
7. Robert J. Pindyck & Daniel L. Rubinfeld, Microeconomics, Pearson latest Edition.

# **MACROECONOMIC ANALYSIS**

## **MODULE-I: NATIONAL INCOME**

Circular Flow of Income in Two, Three and Four-sector economy; Measurement of National Income; National Income and Economic welfare. Theory of Income and Employment-Classical Theory of Income and Employment; Keynes Theory of Employment. Determination of national income in two sector basic model-Expenditure approach and investment-saving approach; Determination of national income in three sector model and four sector model. Green accounting Index and Happiness index.

## **MODULE-II: CONSUMPTION FUNCTION**

Keynes' Psychological law of consumption — implications of the law; short-run and long-run Consumption function; Empirical evidence on consumption function; Consumption Hypothesis — absolute income, relative income, life cycle and permanent income hypotheses

## **MODULE-III: INVESTMENT FUNCTION**

Determinants of Investment- Marginal Efficiency of Capital and Rate of Interest; Marginal Efficiency of Investment and Level of Investment; The Accelerator and Investment Behavior; The Investment Multiplier ;Multiplier- Accelerator Interaction.

## **MODULE-IV: DEMAND AND SUPPLY OF MONEY**

Classical Approach to Demand for Money — Quantity Theory Approach, Fisher's Equation, Cambridge Quantity theory, Keynes's Liquidity Preference Approach, Transaction, Precautionary and Speculative Demand for Money — Aggregate Demand for money, Post-Keynesian approaches to demand for money —Approaches of Baumol ,Tobin, Patinkin and Friedman.

Concept of money supply; mechanistic model of money supply; behavioral model of money supply determination, RBI approach to money supply; money supply determination in an open economy; control of money supply

## **READING LIST**

1. Mankiw, N. G, Macroeconomics, Worth Publishers, 7<sup>th</sup> edition, 2010
2. Shapiro, E. (1996), Macroeconomic Analysis, Galgotia Publications, New Delhi
3. Surrey, M.J.C. (Ed.) (1976), Macroeconomic Themes, Oxford University Press, Oxford.
4. H.L. Ahuja, Macroeconomics
5. Froyen Richard T. " Macroeconomics : Theories and Policies", Sixth Edition, Person Education India.
6. Rana Verma, Macroeconomic

# **MATHEMATICAL ECONOMICS -I**

## **MODULE-1: THEORY OF CONSUMER BEHAVIOUR**

- 1.1 Nature of a Utility Function; Properties of an Indifference Curve; Maximization of Utility; Demand Functions; Ordinary and Compensated, price and income Elasticity.
- 1.2 Elasticity Relations in Demand Analysis and Restrictions on Demand Functions; Slutsky equation-n-commodity case.
- 1.3 Elasticity from and important results: Income and Leisure; Derivation of Labour Supply function and its properties .
- 1.4 Linear Expenditure System- Properties and Derivation of Linear Demand Function; Homogenous and Homothetic Utility Functions; Indirect Utility Functions- Properties, derivation, Roy's Identity, and Derivation of Direct and Inverse Demand Functions; Consumer's Surplus.

## **MODULE -2: THEORY OF FIRM**

- 2.1 Production Function, Properties of a Well Behaved and Homogenous Production Function.
- 2.2 Cobb Douglas, CES production and trans-log production function, product curves, Output Elasticity of Factor Input, Elasticity of Substitution of a Homogenous Production Function-Linearly Homogenous.
- 2.3 Properties of Various Production Functions, Expansion Path
- 2.4 Optimization Behaviour of a Firm-Constrained Cost minimization, Constrained Output Maximization and Profit Maximization.

## **MODULE -3: INPUT DEMAND FUNCTION & COST FUNCTIONS**

- 3.1 Properties and Derivation of Producers Input Demand Functions.
- 3.2 Cost Functions& Properties and Derivation of Short run and long run cost functions.
- 3.3 Determination of Optimum Plant Size.

## **MODULE -4: MARKET**

- 4.1 Perfect Competition- Market Demand, Producer Demand, Supply Functions (Short run and long run).
- 4.2 External Economies and Diseconomies.
- 4.3 Commodity Market Equilibrium under Perfect Competition (Short run and long run).
- 4.4 Differential Cost Conditions and Rent, Effects of Taxes on Optimum Output Level, Supply Function and Price Level; Market Models Duopoly and Oligopoly.

## **Books recommended:**

1. Alpha C. Chiang and Kavin Wainwright: Fundamental Methods of Mathematical Economics, MC Graw Hill, 2005.
2. Gibbons R. Game Theory for Applied Economics.
3. Silber berg E. and Suen, W: The structure of Economics; A mathematical Analysis 3<sup>rd</sup> edition, MC Grow Hill, 2001.
4. K.G. Binmore, Mathematical analysis, Cambridge University Press,1991.
5. Hamdy A. Tana, Operation Research, An Introduction (9<sup>th</sup> edition), Prentice-Hall 2010.
6. Hadley G. Linear Algebra, Addison-Wesley Publishing company, 1977
7. Henderson, J.M. and Quant, R.F. microeconomic theory: A mathematical approach, MC Grow Hill,1980.

## **Statistical Methods Using Computer Application**

### **Unit-I: Descriptive Statistics (Using Ms-Excel)**

- 1.1 Measures of Central Tendency, Dispersion, Skewness & Kurtosis.
- 1.2 Correlation and Regression analysis.
- 1.3 Time Series and Index numbers.

### **Unit-2: Basic Mathematical and Statistical Tools:**

- 2.1 The summation operator, Properties of linear functions, Proportions and percentages some special functions and their properties and differential calculus.
- 2.2 Fundamentals of probability; Basic laws of probability, conditional probability, Theorem of total probability, Bay's theorem and independence of events and simple applications of probability.
- 2.3 Random variables and their probability distributions: Discrete and continuous random variables, P.M.F, P.D.F and C.D.F.

### **Unit-3: Theory of Estimation (Using SPSS)**

- 3.1 Concept of population, Parameter, Statistic, Types of sampling, Sampling distribution and standard error, Concepts of Statistical Hypotheses, Statement and properties of  $\chi^2$ , t and F distributions and their interrelationships.
- 3.2 Independence of sample mean and variance in random sampling from normal distribution.
- 3.3 Point estimation of a parameter, concept of Bias and mean square error of an estimate, Criteria of a good estimator-Consistency, unbiasedness, efficiency and sufficiency with examples.

#### **Unit-4: Statistical Inference (Using SPSS)**

- 4.1 Tests of significance based on  $\chi^2$ -test for specified variance (Association of attributes) goodness of fit and test for independence of attributes. Tests of significance based on student's t-test for single sample specified mean, difference of means for independent and related samples, Sample correlation coefficient. F-test for equality of population variances.
- 4.2 Analysis of Variance
- 4.3 Non-Parametric tests- their advantages and disadvantages, comparison with parametric tests. use of central limit theorem in testing, sign test and Wilcoxon-signed rank (Single and Paired Samples), Two independent sample tests' median test, Wilcoxon-Mann-Whitney U test, Wald Wolfowitz's runs test.

#### **Reference books:**

1. Goon AM, Gupta MK, Das Gupta B: Outlines of Statistics, vol-II, The world press Pvt. Ltd, Kolkata.
2. V.K. Kapoor and S.C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
3. K.V.S. Sarma: Statistics made simple do it yourself on P.C. PHI.
4. Gerald Keller: Applied Statistics with Microsoft Excel, Duxbury Thomson Learning.
5. Siegal S. and Sidney: Non-Parametric Statistics for Behavioural Science, Mc Grow Hill.
6. Hoel P.G.: Introduction to Mathematical Statistics, Asia Publishing House.
7. Hogg, Tanis, Rao Probability and Statistical inference 7<sup>th</sup> edition Pearson Publication.



# **ENVIRONMENTAL ECONOMICS**

## **MODULE-I: ECONOMY AND ENVIRONMENT**

Pareto optimality and Competitive equilibrium; Fundamental theorem of Welfare economics; Externalities and market inefficiency- Externalities as missing markets; Property rights and Externalities and Non-convexities. Pareto optimal provision of public goods-Lindahl's equilibrium, Preference revelation problem and impure-mixed public goods. Common property resources. Interaction Between Ecological and Economic Systems; Environment-Development-Poverty Nexus, Institutional economics Paradigm, The market model of environmental values;

## **MODULE-II: ENVIRONMENT AND SUSTAINABLE DEVELOPMENT**

The concept of sustainable development, Measuring of sustainable development, sustainable macroeconomics accounting of national income and wealth, Green accounting. The environment Kuznets curve, theory of Krutilla-Fisher Equation for preservation or development; Environmental cost-benefit Analysis for sustainable development, Rationale of discounting future in the context of sustainability; Endogenous growth theory and sustainable development; Technological change and environment.

## **MODULE-III: ENVIRONMENTAL VALUATION**

Meaning of environmental valuation, the uses of economic value, costs, benefits, willingness to pay and willingness to accept, Total economic value, Option value, Existence value, Empirical measures of option and existence value, Total economic value and decision making; Description of valuation methodologies: Revealed preference versus stated preference, hedonic price approach, Household production function, Travel cost approach, Defensive and Contingent valuation method.

## **MODULE-IV: THE ECONOMICS OF POLLUTION**

The optimal level of pollution, Pollution as externality, alternative definitions of pollution, The market achievement and optimal pollution, Property rights and market bargain theorems, Coase theorem. The optimal Pigovian tax, Pollution charges and abatement costs, Pollution reduction subsidies, Design of Environmental Policy instruments: Pollution taxes and pollution permits. The theory of marketable permits, The advantages of marketable permits, Types of permit system, Permit trading in practice. Trade and Environment in WTO regime. RIO conventions, Climatic change problems, Kyoto Protocol, UNFCCC, Bali action plan Post 2015 agreements. Green Climate fund

## **READING LIST**

1. Charles Kolstad, Intermediate environmental economics, Oxford University Press. Latest edition.
2. Bhattacharya, R N (latest edition), Environmental Economics: An Indian Perspective (E), Oxford University Press, New Delhi, 2011.
3. Dasgupta, P (2001), Human well being and natural environment, Oxford University Press
4. Singh K and Shishodia A. Environmental Economics: Theory and Application, Sage Publication, New Delhi, 2007-2012.
5. Tietenberg, T. (1994) Environmental Economics Policy and Harper Collins New York.

## **Financial Economics-I**

### **Unit-I: Introduction to Corporate Finance & Banking**

- 1.1 Corporate Finance, Corporate firm and the Goals of the Corporate firm; Basic concepts and ideas, Emerging role of financial managers in India
- 1.2 Regulatory frame work- Industrial policy, Companies Act and SEBI guidelines.
- 1.3 Types of Banking, Types of Banks, RBI, NABARD.

### **Unit-II: Financial Markets; Characteristics and Operations**

- 2.1 Stock market- types of Shares, primary and secondary market; Market indexes, GDR and ADR, Stock market and Macroeconomic variables, Stock market and issues of foreign capital inflows.
- 2.2 Bond Market:  
Basic theory of interest; discounting and Evaluation criteria; Fixed-Income securities, bond prices and yields; Interest rate sensitivity and duration; Immunisation; the term structure of interest rates; yield curves; spot rates and forward rates; yield-to-maturity, yield-to-call, current yield, holding period return; Risks in bonds, G-secs market and corporate bond market in India.
- 2.3 Money Market- Call money market; Treasury bill market, commercial bill market, Mutual fund, Repo and Reverse repo.

### **Unit-III: Corporate Financial Reporting**

- 3.1 Overview of financial statement analysis
- 3.2 Structure of financial statements: Balance sheet, income statement, Statement of Cash Flow.
- 3.3 financial ratios and financial statement analysis, financial cash flow analysis.

### **Unit-IV: Value and Capital Budgeting**

- 4.1 Valuation of financial assets using Net present value.
- 4.2 NPV v/s some alternative investment rules:  
Payback period, discounted payback period, average accounting return, profitability index and internal rate of return.
- 4.3 Strategy and analysis using net present value: Decision tree, Sensitivity analysis, Scenario analysis and break even analysis.
- 4.4 Pricing of derivatives- future and options.

## **Unit-V: Risk and Capital Budgeting**

- 5.1 Introduction to risk, return and opportunity cost of capital: measuring portfolio risk, diversification, and its limits.
- 5.2 Return and Risk: Capital asset pricing model, validity and role of capital asset pricing model, some alternative view of risk and return, consumption betas, the arbitrage pricing theory, three-factor model.
- 5.3 Risk, Return and Capital Budgeting: cost of equity capital, estimation of beta, determinants of beta, cost of capital with debt.
- 5.4 Practical problems in capital budgeting.
- 5.5 Dividends: meaning, types, process, determinants, and policies.

## **Readings:**

1. Copeland, T.E. Weston, J.F. and Shastri, K. (2005), Financial Theory and corporate policy, Pearson Higher education, international edition, 4<sup>th</sup> edition.
2. Wild, J.J. Subramanyam, K.R. and R.F. Halsey (2007), Financial statement analysis, Tata MC Grow Hill Publishing Company Limited, New Delhi, 9<sup>th</sup> edition.
3. Ross, S.A. Westerfield, R.W. and J. Jaffe (1999), Corporate Finance, MC Grow Hill international edition, Finance Series, 5<sup>th</sup> edition.
4. Sharpe, W.F. Alexander, G.J. and J.V. bailey (2000), Investments, Prentice Hall of India, 5<sup>th</sup> edition.
5. Brealey, R.A. Myers, S.C. Allen, F. and P. Mohanty (2007), Principles of corporate finance, Tata Mc Grow Hill Publishing Company Limited, New Delhi, 8<sup>th</sup> edition.
6. Hull, J.C. (2008) Options, Futures and other derivatives, prentice Hall, 7<sup>th</sup> edition.
7. Levi, M.D. (2005) International finance, Routedge.
8. F.S. Mishkin and S.G. Eakings, Financial markets and institutions, Pearson Education, 6<sup>th</sup> edition, 2009.
9. M.R. Baye and D.W. Jansen, Money banking and financial markets, AITBS, 1996.
10. M.Y. Khan, Indian Financial System, Tata McGrow Hill, 7<sup>th</sup> edition, 2011.

## **SEMESTER-II**

### **ADVANCED MICROECONOMIC ANALYSIS**

#### **MODULE-I: OLIGOPOLY AND ECONOMIC BEHAVIOUR OF FIRM**

Oligopoly–Price and Output Determination; Non-collusive oligopoly; Homogeneous Product-Cournot & Stackelberg model; Non-homogeneous Product; Chamberlin’s model & the kinked demand curve model. Collusive Oligopoly; Cartels, mergers, and price leadership. Marshallian versus Walrasian stability analysis

#### **MODULE-II: THEORY OF DISTRIBUTION**

Marginal productivity theory, Modern Theory of distribution, Wage Determination under Collective Bargaining, Theory of Profit; Dynamic Theory, Innovation Theory, Risk and Uncertainty Theory. Macro theories of distribution– Marxian and Kaldor’s.

#### **MODULE-III: WELFARE ECONOMICS**

Pigovian welfare economics; Pareto optimal conditions; Value judgment; Social welfare function; Compensation principle; Inability to obtain optimum welfare– Imperfections, market failure, externalities, decreasing costs, uncertainty and non-existent and incomplete markets; Theory of second best–Arrow’s impossibility theorem.

#### **MODULE-IV: GENERAL EQUILIBRIUM**

Partial and General Equilibrium, Input-output approaches to general equilibrium, General Equilibrium of consumption, production and exchange, Existence, Stability(Marshallian versus Walrasian stability analysis) and uniqueness of equilibrium and general equilibrium. Equilibrium of the firm and industry. Game theory and Strategic decisions. Dominant strategies, Nash Equilibrium.

#### **READING LIST**

1. Varian, H. (2000) Microeconomic Analysis, W.W. Norton.
  2. Koutsoyiannis, A. (1979), Modern Microeconomics, (2<sup>nd</sup> Edition), Macmillan Press, London.
  3. Pyndyck, R.S. & D.L. Rubinfeld (1999), Microeconomics, (3<sup>rd</sup> Edition) Pentice Hall of India.
- Sen, A.K. (1970), Collective Choice and Social Welfare, Holden Day In

# **ADVANCED MACROECONOMIC ANALYSIS**

## **MODULE-I: SUPPLY OF MONEY**

Concept of money supply; mechanistic model of money supply; behavioral model of money supply determination, RBI approach to money supply; money supply determination in an open economy; control of money supply. High powered money and money multiplier; budget deficits;

## **MODULE-II: NEO-CLASSICAL AND KEYNESIAN SYNTHESIS**

Neo-classical and Keynesian views on interest; The IS-LM model; Extension of IS-LM model with government sector; Relative effectiveness of monetary and fiscal policies. Fiscal policy and crowding out effect, Role and effective fiscal and monetary policies. Aggregate demand and aggregate supply model.

## **MODULE-III: MACROECONOMICS IN AN OPEN ECONOMY AND NEW CLASSICAL MACROECONOMICS**

Foreign Exchange Market and Income Determination, Capital flow and effective demand: Mundell – Fleming model and policy effectiveness under alternative exchange rate regimes (fixed v/s flexible exchange rates). Inflation and Monetary Policy: Inflation, Money growth and Interest rates, Monetary Policy and the term structure of interest rates, the dynamic inconsistency of low-inflation monetary policy. Monetary approach to balance of payments. Policy implications of new classical approach — empirical evidence. Phillips curve analysis: Expectation Augmented Phillips curve analysis; Natural rate of unemployment.

## **MODULE-IV: THEORY OF INFLATION AND BUSINESS CYCLES**

Classical, Keynesian and Monetarist approaches to inflation; Structuralist theory of inflation; Philips curve analysis. Short run and long run Philips curve; Tobin's modified Philips curve; Policies to control inflation. Business cycle- meaning and features; Theories of Business cycle- Hawtrey, Keynes, Samuelson, Kaldor, Hicks, Goodwin's model.

## READING LIST

1. Ackley,G (1978), Macroeconomics : Theory and Policy, Macmillan, New York
2. Branson, W.A. (1989), Macroeconomic Theory and Policy, (3rd Edition), Harper and Row, New York.
3. Dornbusch, R. and F. Stanley (1997), Macroeconomics, McGraw Hill, Inc., New York
4. Hall, R.E. and J.B. Taylor (1986), Macroeconomics, W.W. Norton, New York
5. Jha, R. (1991), Contemporary Macroeconomic Theory and Policy, Wiley Eastern Ltd., New Delhi
6. Levacic, R and Rebmann, A “Macro Economics- An introduction to Keynesian –neo-classical controversies”, second edition, Macmillan, London.
7. Mankiw, N. G, Macroeconomics, Worth Publishers, 7<sup>th</sup> edition, 2010
8. Romer, D.L. (1996), Advanced Macroeconomics, McGraw Hill Company Ltd., New York. Scarfe, B.L. (1977), Cycles, Growth and Inflation, McGraw Hill, New York
9. Shapiro, E. (1996), Macroeconomic Analysis, Galgotia Publications, New Delhi

## **MATHEMATICAL ECONOMICS-II**

### **MODULE-1: THE EXISTENCE AND UNIQUENESS OF EQUILIBRIUM**

- 1.1 The stability of Equilibrium. static stability- Marshallian and Walrasian stability conditions and Dynamic Stability- lagged Adjustment the cobweb model.
- 1.2 Monopoly-maximization of profit and sales Revenue price discrimination: Market discrimination and Perfect discrimination.
- 1.3 Multi-plant Monopolist Effect of various taxes on output and price of a monopoly firm, bilateral monopoly.
- 1.4 Monopolistic competition equilibrium: Short run and long run.

### **MODULE--2: MACRO ECONOMIC MODELS**

- 2.1 Keynesian theory of Income determination and derivation of different multipliers.
- 2.2 Employment and output determination with fixed flexible prices: IS-LM and AD-AS models, Fleming-Mundell open economy model.
- 2.3 Trade cycles: multiplier-accelerator interaction models of Samuelson and Hicks, Real business cycle.
- 2.4 Growthy Models: Harrod-Domar model, Neoclassical models of Solow & Meade and Kaldor's model, Endogenous growth models.

### **MODULE--3: LINEAR PROGRAMMING**

- 3.1 Simplex Method: Problem of degeneracy and mixed constraints, duality theorems.
- 3.2 Complementary slackness conditions, Application of linear programming in Economics.
- 3.3 Input-output analysis of static, dynamic, closed and open input-output models, Hawkins-Simon conditions of viability, determination of gross output price and value added in open-output model, determination of gross output in closed input-output model.

### **MODULE-4: THEORY OF GAMES**

- 4.1 Introduction, use of game theory, Zero-sum games, Nash equilibria, mixed-strategy Nash equilibrium.
- 4.2 Extensive form games
- 4.3 Repeated Games
- 4.4 Bayesian Games: General definitions, ex-ante/interim, Bayesian Nash equilibrium.



## REFERENCE BOOKS:

1. Alpha C. Chiang and Kavin Wainwright: Fundamental Methods of Mathematical Economics, MC Graw Hill, 2005.
2. Gibbons R. Game Theory for Applied Economics.
3. Silber berg E. and Suen, W: The structure of Economics; A mathematical Analysis 3<sup>rd</sup> edition, MC Grow Hill, 2001.
4. K.G. Binmore, Mathematical analysis, Cambridge University Press, 1991.
5. Hamdy A. Tana, Operation Research, An Introduction (9<sup>th</sup> edition), Prentice-Hall 2010.
6. Hadley G. Linear Algebra, Addison-Wesley Publishing company, 1977
7. Henderson, J.M. and Quant, R.F. microeconomic theory: A mathematical approach, MC Grow Hill, 1980.

# Mathematical Statistics

## **Unit-I: Random Variables and Mathematical Expectation**

- 1.4 Definition of random variable, discrete and continuous random variables, functions of random variables, probability mass function and probability density function with illustrations.
- 1.5 Distribution function and its properties, Transformation of one-dimensional random variable, Notion of bivariate random variable, bivariate distribution, statements of its properties, Joint marginal and conditional distributions, independence of random variables.
- 1.6 Mathematical expectation of a function of a random variable, Raw and central moments. Covariance using mathematical expectation with examples, Addition and multiplication theorems of expectation. Chebyshev's and Cauchy-Schwartz's inequalities and their applications. Definitions of moment generation function (m.g.f.), characteristic function (c.f.), cumulate generating function (c.g.f.), probability generating function (p.g.f) and statements of their properties with applications.

## **Unit-2: Probability Distribution (Using Ms-Excel):**

- 2.1 Discrete distributions; Uniform and Bernoulli distributions: definitions, means, variance, and simple examples, Definition and derivation of probability mass functions of Binomial distribution, Poisson distribution, properties of these distribution; median, mode M.G.F., C.G.F., P.G.F., C.F. and moments up to fourth order.
- 2.2 Continuous Distribution; normal distribution, definition, properties such as M.G.F., C.G.F., C.F. and moments up to fourth order, reproductive property, wherever exists and their real life applications.
- 2.3 Normal distribution as a limiting case of Binomial and Poisson distributions. Rectangular, Exponential, Gamma distribution.

### **Unit-3: Sampling theory and Estimation**

- 3.1 Properties of a good estimator, Sampling and Non-sampling errors, SRSWR and SRSWOR, determination of sample size, stratified random sampling and different allocations, systematic sampling, limit theorems: weak law of large numbers, central limit theorem de Moivre's Laplace Theorem.
- 3.2 Estimation: parameter space, sample space, finite sample, properties of estimators and estimates – unbiasedness, the sampling variance of estimators and efficiency, asymptotic or large sample properties of estimators- consistency, asymptotic normality, and central limit theorem.
- 3.3 General approaches to parameter estimation-Method of moments, maximum likelihood and least squares, interval estimation and confidence intervals- the nature of interval estimation, confidence intervals for the parameters of normal distribution, confidence intervals for difference of means and for ratio of variances.

### **Unit-4: Analysis of Variance and Design of Experiments**

- 4.1 Concept of Gauss-Markoff linear model with examples, statement of Cochran's theorem.
- 4.2 ANOVA – one-way, two-way classifications with one observation per cell expectation of various sums of squares.
- 4.3 Principles of experimentation; Analysis of completely randomized (C.R.D), Randomized block design (R.B.D.), importance and application of design of experiments.

### **Reference Books:**

1. V.K. Kapoor and S.C. Gupta: Fundamentals of Applied Statistics, Sultan Chand.
2. A.M. Goon, M.K. Gupta and B. das Gupta, an outline of Statistical theory latest edition.
3. R.V.Hogg, A.T., Craig and J.W. Mc Kean: Introduction to Mathematical Statistics Latest edition.
4. V.K. Rohatgi and A.K. Md.E. Saleh, An introduction to Probability and Statistics, 2<sup>nd</sup> Edition, John Wiley and sons, 2009.
5. Gerald Keller: applied Statistics with Microsoft Excel, Duxbury, Thomson Learning.
6. Willian Feller: Introduction to Probability theory and its Applications (Vol-I), Wiley.

## **Financial Economic-II**

### **Unit-1: Capital Structure**

- 1.1 Corporate financing and efficient market hypothesis; anomalies and lessons of market efficiency.
- 1.2 The capital structure and the Pie theory, maximizing firm value vs Maximizing stockholder's interest, Financial leverage and firm value- Modigliani and Miller propositions, Implications of Corporate Taxes, Personal taxes and costs of financial distress, financial leverage and growth.
- 1.3 Valuation and capital budgeting for levered firm- APV, Flow-to-equity and WACC approach.

### **Unit-2: Sources of Short-term and Long-term financing**

- 2.1 Cash and credit management; issuing equity securities to public, long-term debt, options, warrants, convertibles, leasing.
- 2.2 Special topics: Mergers and Acquisitions, negotiable instruments, Global crisis.

### **Unit-3: Foreign Exchange and Derivative Markets**

- 3.1 Organization of the foreign exchange market, Balance of payment.
- 3.2 The Spot Market- organization of the interbank spot market, direct, indirect, and cross rates, Bid-ask spread, triangular arbitrage.
- 3.3 Forward Market- Premium and discount, forward rate and expected future spot rate, pay-off profile, outright forward exchange and swaps, forward quotation.
- 3.4 Currency futures and currency options.

### **Unit-4: Parity Conditions and Foreign Investment Analysis**

- 4.1 The law of one price- purchasing power parity, the fisher effect, the international fisher effect, the interest rate parity, the unbiased forward rate hypothesis.
- 4.2 International portfolio investment, corporate strategy and FDI, capital budgeting for MNC.
- 4.3 Multinational working capital management; International cash management, Accounts receivable management, Inventory management, short-term financing.

## **Unit-5: Foreign Exchange Risk Management and Financing the Multinational Corporation**

- 5.1 Foreign exchange exposure and risk management, alternative measure of foreign exchange exposure, concept of hedging, cost and benefit of standard hedging technique, Hedging through derivatives; Foreign currency futures and options; Swaps and interest rate derivatives.
- 5.2 Measuring and managing economic exposure, measuring translation exposure; Measuring and managing transaction exposure; forward market hedge, money market hedge, risk shifting exposure netting, currency risk sharing, currency collars and cross hedging.
- 5.3 International financing and national capital markets: Corporate sources and use of fund, national capital markets as international financial centres, Development banks, project finance.
- 5.4 The EURO markets: Euro currency markets, Euro bonds, note issuance facilities, Euro notes, Euro commercial papers, Asia currency markets.
- 5.5 Cost of capital for foreign investment; cost of equity, cost of debt, WACC for foreign projects, discount rates for foreign investment.

### **Readings:**

1. Copeland, T.E. Weston, J.F. and Shastri, K. (2005), Financial Theory and corporate policy, Pearson Higher education, international edition, 4<sup>th</sup> edition.
2. Wild, J.J. Subramanyam, K.R. and R.F. Halsey (2007), Financial statement analysis, Tata MC Grow Hill Publishing Company Limited, New Delhi, 9<sup>th</sup> edition.
3. Ross, S.A. Westerfield, R.W. and J. Jaffe (1999), Corporate Finance, MC Grow Hill international edition, Finance Series, 5<sup>th</sup> edition.
4. Sharpe, W.F. Alexander, G.J. and J.V. bailey (2000), Investments, Prentice Hall of India, 5<sup>th</sup> edition.
5. Brealey, R.A. Myers, S.C. Allen, F. and P. Mohanty (2007), Principles of corporate finance, Tata Mc Grow Hill Publishing Company Limited, New Delhi, 8<sup>th</sup> edition.
6. Hull, J.C. (2008) Options, Futures and other derivatives, prentice Hall, 7<sup>th</sup> edition.
7. Levi, M.D.(2005) International finance, Routedge.
8. F.S. Mishkin and S.G. Eakings, Financial markets and institutions, Pearson Education, 6<sup>th</sup> edition, 2009.
9. M.R. Baye and D.W. Jansen, Money banking and financial markets, AITBS, 1996.
- 10.M.Y. Khan, Indian Financial System, Tata Mc Grow Hill, 7<sup>th</sup> edition, 2011.

# **Research Methodology**

## **UNIT 1. Foundations of Research**

1. Meaning, Objective, Motivation, utility.
2. Concept of theory, empiricism deductive and inductive theory.
3. Characteristics of scientific method.
4. Variables
5. Research process.

## **UNIT 2. Problem identification & formulation**

1. Research question
2. Hypothesis and types of hypothesis
3. Qualities of a good hypothesis
4. Testing of hypothesis

## **UNIT 3. Research Design**

1. Concept and importance in Research
2. Features of a good research design
3. Research Methods vs Methodology
4. Types of research- Descriptive vs analytical, applied vs fundamental, Quantitative vs Qualitative, conceptual vs Empirical.
5. Review of literature.

## **UNIT 4. Data collection and Analysis**

1. Methods of data collection
2. Sampling methods
3. Data processing and analysis strategies and tools.
4. Data analysis with statically package (sigma STAT, SPSS for student, t-test ANOVA, etc.)
5. Concept of measurement, levels of measurement nominal, ordinal, internal ratio.

## **UNIT 5. Interpretation and Report writing**

1. Meaning of interpretation
2. Technique of interpretation
3. Precautions in interpretation
4. Significance of Report writing
5. Different step in writing report
6. Types of Report, Precautions for writing research reports, conclusions.

## **UNIT 6. Research ethics, IPR and Scholarly publishing**

1. Ethical issues.
2. IPR (Intellectual property rights and patent law)
3. Commercialization, copy right, royalty, trade related aspects of intellectual property rights (TRIPS)
4. Scholarly publishing – IMRAD concept and design of research paper, citation and acknowledgement, plagiarism, reproducibility and accountability.

### **References:**

1. Wilkinson & Bhandarkar: Methodology and Techniques of Social Research.
2. Pauline Vyoung: Scientific Social Surveys and Research.
3. Panneerselvam,R., Research Methodology, Prentice Hall Of India,New Delhi,2004
4. Kothari: Research Methodology.
5. Festinger. L & D. Katz: Research Methods in Behavioral Science.
6. Sellitz, Et Al: Research Methods in Social Relations.