COURSE OBJECTIVES & OUTCOMES OF UNDER GRADUATE CURRICULUM IN ECONOMICS

NISTARINI COLLEGE, PURULIA

AFFILIATED TO

SIDHO-KANHO-BIRSHA UNIVERSITY,

PURULIA, WEST BENGAL

ECONOMICS UG SYLLABUS FOR NEP 2020

SYLLABUS FOR SEMESTER-I MAJOR COURSES

Course Title: Foundation Course in Economics – I
Course Code: BECOMAJ01T
Credit: 6
Classes: 90

A. Microeconomics: (30 Lectures)

1. Exploring the Subject Matter of Economics: Scope and Method of Economics: Scarcity and Efficiency, Competing Ends and Choice - Defining Economics, Thinking like an Economist: Basic Economics Questions, Microeconomics and Macroeconomics, Normative Economics and Positive Economics.
2. Supply and Demand: Determinants of demand and supply; Demand and Supply schedules; Individual and Market Demand and Supply; Law of demand and supply, shifts in the demand and supply curves; Interaction of demand and supply; Equilibrium price and quantity.
3. Elasticity and its Measurement: Types of Elasticity of Demand, Price, Income and Cross Elasticity, Measurement of Elasticity of Demand, Determinants of Elasticity of Demand.
4. Production: Production Function, Total Production, Marginal Production, Average Production, Revenue Functions.
5. Economic Costs and Revenue: Cost in the Short run, Fixed Costs and Variable Costs, Marginal Costs, Long run AC and MC, TR, MR, AR.
6. Market Structures: Definition, Types and Features.

B. Macroeconomics: (30 Lectures)

1. Introduction: Nature and Scope of Macro Economics.
2. National Income Accounting: Concepts of GNP, NNP, GDP, NDP, NI, DI; Methods of measurement- Product Census Method, Income Census Method and Expenditure Method; Using GDP as a Measure of economic welfare and problems involved.
3. Circular Flow of Income: Household, Firm, Injection and Leakage.
4. Open Economy : Concepts; Output, Financial and Labour Markets; Distinguish between Closed and Open Economy.

C. International Trade: (30 Lectures)

1. Introduction: One Factor Economy; Relative Prices and Production; Production under Self Sufficiency (Autarky); Specialization and Trade; Concept of International Economics.
2. The Classical Theory: Smith's Theory of Absolute Advantage; Ricardian Theory of Comparative Advantage (Assumption, Explanation, Algebraic Formulation); Comparative versus Absolute Advantage; Opportunity Cost Approach (Neo-Classical Theory) - Graphical Presentation.
3. Balance of Payments: BoP Account; Current Account; Capital Account, Terms of Trade.

Reading References:

Microeconomics:

1. Hal R. Varian, 2010, *Intermediate Microeconomics: A Modern Approach*,W.W. Norton and Company/affiliated East West Press (India), 8th edition.
2. Anindya Sen, *Microeconomics: Theory and Applications*, Oxford University Press
3. Pindyck, Rubinfeld and Mehta, *Microeconomics*, Pearson
4. B. Douglas Bernheim and Michael D. Whilston, 2009, *Microeconomics*, Tata McGraw Hill (India)
5. C. Snyder and W. Nicholson, 2010, *Fundamentals of Microeconomics*, Cengage Learning (India).
6. Jogendranarayan Mitra, 2010, *Undergraduate Microeconomics*, New Central Book Agency, Kolkata.

Macroeconomics:

1. Mankiw, N., 2016, *Macroeconomics*, 9th edition, Worth Publishers
2. Branson, W., 2013, *Macroeconomics*, Theory and policy, 3rd edition, East West Press
3. Jones, C., 2016, *Macroeconomics*, 4th edition, W. W. Norton
4. Blanchard, O., 2018, *Macroeconomics*, 7th edition, Pearson Education
5. Abel, A., Bernanke, B., 2016, *Macroeconomics*, 9th edition, Pearson Education
6. Errol D'Souza, 2009, *Macroeconomics*, Pearson Education , New Delhi
7. Richard T. Froyen, 2016, *Macroeconomics*, Pearson education Asia, 10th edition
8. Sikdar Soumen, *Principles of Macroeconomics*, Oxford University Press
9. Ackley, *Macroeconomic Theory and Policy*, 2nd edition

International Trade:

1. Soderston, B.O., *International Economics*, Macmillan
2. Rajat Acharya, *International Economics*, Oxford University Press
3. J. Sarkhel and S. Salim, *International Economics*, Book Syndicate (P) Limited
4. KN Verma, 2021, *International Economics: Theory and Policy*, Vishal Publishing Co., 1st Edition.
5. Paul Krugman, Maurice Obsfeld and Marc Melitz, 2018, *International Trade: Theory and Policy*, Pearson, 11th Edition.

Course Objective:

This course provides a comprehensive introduction to microeconomics, macroeconomics, and international trade, equipping students with the tools to analyze economic phenomena and make informed decisions. It explores the fundamental principles of microeconomics, including scarcity, efficiency, market mechanisms, elasticity, production, costs, and market structures. In macroeconomics, students learn about national income accounting, the circular flow of income, and the dynamics of open economies. The international trade section delves into classical and neoclassical trade theories, specialization, and the balance of payments. Overall, the course fosters critical thinking and practical application of economic concepts to real-world challenges.

Program Outcomes:

1. Upon completing this course, students will have a solid understanding of fundamental microeconomic and macroeconomic principles, enabling them to analyze market mechanisms, production processes, costs, and various market structures.

2. They will be able to evaluate national economic performance through key concepts such as GDP, national income, and the circular flow of income, while also gaining insights into the dynamics of open and closed economies.

3. Additionally, students will understand international trade theories, including classical and neoclassical models, and the balance of payments framework. By applying these concepts to real-world scenarios, students will enhance their decision-making abilities and contribute meaningfully to discussions on economic development and trade.

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END OF SEMESTER-I (MAJOR)

SYLLABUS FOR SEMESTER-II MAJOR COURSES

Course Title: Foundation Course in Economics – II
Course code: BECOMAJ02T
Credit: 6
Classes: 90

1. Indian Economics: (25)
Features of the Economy; Evolution of India's Development Goals; Agriculture and Industry; Public Sector vs. Private Sector; Population and Poverty; Inequality and Unemployment; Planning vs NITI Ayog; Economic Reforms in India**.**

2. Development Economics: (25)
Meaning and Characteristics; Income and Capability Approach; HDI and MDG; Economic Growth; Growth vs Development; International Comparisons; Inequality and Development; HPI and Hunger Index; Political Institutions and the State; The Determinants of Democracy; State Ownership and Regulation; Government Failures and Corruption.

3. Public Finance: (15)
Definition and Scope; Externalities, Market Failure and Government Intervention; Overview of Public Good; Pure Public Good and Private Good; Market Failures; Classification of Taxes; Canons of Taxation; Benefit Principle; Incidence and Burden of Taxes; The Laffer curve; Public Expenditure; Government Budget and Expenditure; Public Debt; Sources of Public Borrowings.

4. Basic Statistics: (25)
Data Collection; Presentation of Data; Tabulation; Frequency Distribution; Graphical Expression (Bar, Line, Pie, Histogram, Ogive); Measures of Central Tendency; Measures of Dispersion; Moments, Skewness and Kurtosis.

Reading References:

Indian Economics:

1. R. Datt and K.P. M. Sundaram, 2023, *Indian Economy*, S. Chand and Co., (Paperback: Gourav Datt and Ashwani Mahajan).
2. Raj Kumar Sen, 2011, *Modern Indian Economy*, Deep and Deep Publications, New Delhi.
3. A.N. Agarwal and M.K. Agarwal, 2019, *Indian Economy: Problems of Development and Plannning,* New Age International Pvt. Ltd.
4. K.L. Krishna and A. Vaidyanathan, *Institutions and Markets in India's Development.*
5. Himanshu, 2010, "Towards New Poverty Lines for India", *Economic and Political Weekly*, January.
6. Jean Dreze and Angus Deaton, 2009, "Food and Nutrition in India: Facts and Interpretations", *Economic and Political Weekly*, February.

Development Economics:

1. Jean Dreze and Amartya Sen, *Economic Development and Social Opportunity*, OUP.
2. R.J. Chelliah, 2009, *Towards Sustainable Growth*, OUP.
3. VC Sinha and S. Pandeya, 2021, *Planning and Economic Development*, SBPD Publications.
4. Debraj Ray, 2009, *Development Economics*, Oxford University Press.
5. Partha Dasgupta, 2007, *Economics: A Very Short Introduction*, Oxford University Press.
6. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee, 2006, *Understanding Poverty*, Oxford University Press.

7. Kaushik Basu, 2007, *The Oxford Companion to Economics in India*, OUP.
8. Amartya Sen, 2000, *Development as Freedom*, OUP.

Public Finance:

1. J. Hindriks and G. D. Myles, 2006, *Intermediate Public Economics*, The MIT Press; Annotated Edition.
2. A Ghosh and C. Ghosh, 2014, *Public Finance*, Prentice Hall India Learning Private Limited; 2nd Revised edition.
3. S. Mukherjee, A. Ghosh and R.N. Nag, 2008, *Analytical Public Finance: Ricardo to Musgrave*, New Central Book Agency, Kolkata.
4. HL Bhatia, 1977, *Public Finance*, Vikash Publishing House, New Delhi.
5. S. Mukherjee, A. Ghosh, and RN Nag, 2008, *Analytical Public Finance: Ricardo to Musgrave*, New Central Book Agency, Kolkata.

Statistics:

1. R.V. Hogg and A.T. Craig, *An Introduction to Mathematical Statistics*, Third Edition, Amerind, New York, London
2. Mood, A.M., F.A. Greybill and D.C. Boe, 1974, *Introduction to the Theory of Statistics*, McGraw Hill.
3. John E. Freund, 1992, *Mathematical Statistics*, Prentice Hall.
4. Goon, Gupta & Dasgupta, 1985, *Basic Statistics*, World Press Private Limited.
5. R.V. Hogg and A.T. Craig, *An Introduction to Mathematical Statistics*, Third Edition, Amerind, New York, London.
6. Mood, A.M., F.A. Greybill and D.C. Boe, 1974, *Introduction to the Theory of Statistics*, McGraw Hill.
7. John E. Freund, 1992, *Mathematical Statistics*, Prentice Hall.
8. R. Ganesan and PV Sreenivasaiah, 2015, *Textbook of Statistics*, Write and Print Publication, 1st edition.
9. SS Gupta and VK Kapoor, 2020, *Fundamentals of Mathematical Statistics*, 12th edition, Sultan Chand & Sons.

Course Objective:

This course aims to provide students with a comprehensive understanding of key concepts in Indian economics, development economics, public finance, and basic statistics. It covers the features of the Indian economy, its evolution, and key issues like agriculture, industry, population, poverty, inequality, and unemployment. The course explores development economics by discussing growth versus development, international comparisons, and the role of political institutions in shaping development outcomes. Students will also learn about public finance, focusing on market failure, government intervention, taxation, public expenditure, and debt management. Additionally, the course introduces basic statistical methods, including data collection, presentation, and analysis, equipping students with the tools needed to interpret economic data and make informed decisions.

Program Outcomes:

1. Upon completing this course, students will have a strong understanding of the key economic issues facing India, including the roles of agriculture, industry, and public

versus private sector, as well as the challenges of poverty, inequality, and unemployment.

2. They will be able to differentiate between economic growth and development, and assess the impact of political institutions and government policies on development outcomes.

3. In public finance, students will gain insights into taxation, market failures, public goods, government budgeting, and public debt. Additionally, students will acquire essential skills in basic statistics, such as data collection, presentation, and analysis, enabling them to effectively interpret economic data and apply it to real-world scenarios.

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END OF SEMESTER-II (MAJOR)

SYLLABUS FOR SEMESTER-III MAJOR COURSES

Course Title: Micro Economics with Mathematical Applications
Course Code: BECOMAJ03T
Credit: 6
Classes: 90

1. Utility Theory: Utility Functions and their properties **(5)**

2. The Consumption Decision: (15)
Budget constraint, Consumption and income and price changes, Demand for all other goods and price changes; Description of preferences- most preferred bundle and its properties; Consumer optimum choice; Income and substitution effects; Marshallian and compensated demand curves; Price consumption curve, Income consumption curve, and Engel curve; Labour supply and savings decision - choice between leisure and consumption; Compensating and equivalent variation, Slutsky equation; Consumption-leisure choice and labour supply; Revealed preference approach.

3. Production and Costs: (15)
Basic concepts of Isoquants; Cobb–Douglas Production Function, CES Production Function, General concept of homogenous and homothetic production function and their properties; iso cost line and firms equilibrium and expansion paths; relation between short run and long run costs.

4. Market Structure: (30)
(a) Perfectly competitive market; (b) Monopoly; Pricing with market power; Degree of monopoly; Price discrimination-different degrees; Multiplant monopoly; Peak-load pricing; Two-part tariff; Monopolistic competition. (c) Oligopoly: Cournot Equilibrium, Bertrand Equilibrium, Stackelberg Equilibrium; Concept of collusion and cartels; (d) Monopsony, Bilateral monopoly in labour market.

5. Input Market: (10)
Distribution Theory, Input demand for competitive firm and competitive industry, returns to scale and product exhaustion.

6.General Equilibrium, Efficiency and Welfare: (15)
(a) Exchange Economy, Consumption Allocation and Pareto Optimality; Edgeworth box and contract curve; Equilibrium and efficiency under pure exchange; (b) Pareto efficiency with production: concepts of PPF, SIC, and resource allocation; (c) Perfect competition, Pareto efficiency and market failure (externalities and public good); Property Right and Coase Theorem.

Reading References:

1. Hal R. Varian, 2010, *Intermediate Microeconomics: A Modern Approach*, W.W. Norton and Company/Affiliated East-West Press (India), 8th edition.
2. Hugh Gravelle and Ray Rees, 2004, *Microeconomics*, Prentice Hall (UK); 3rd edition.
3. Anindya Sen , *Microeconomics: Theory and Applications*, Oxford University Press.
4. Pindyck, Rubinfeld and Mehta, 2007, *Microeconomics*, Pearson, 7th Edition.
5. Mas-Collel, Whinston and Green, 2012, *Microeconomic Theory*, OUP(Indian edition).
6. GC Archibald and Richard Lipsey, 1984, *An Introduction to Mathematical Treatment of Economics*, 3rd Edition, AITBS, Delhi.
7. B. Douglas Bernheim and Michael D. Whilston, 2009, *Microeconomics*, Tata McGraw Hill (India)
8. C. Snyder and W. Nicholson, 2010, *Fundamentals of Microeconomics*, Cengage Learning (India).
9. Jogendranarayan Mitra, 2010, *Undergraduate Microeconomics*, New Central Book Agency, Kolkata.
10. Satya R. Chakravarty, *Microeconomics*, Allied Publishers Ltd.

11. TC Bergstrom and HR Varian, 2014, *Workouts in Intermediate Microeconomics*, 9th Edition, W.W. Norton and Company.

Course Objective :

This course aims to provide students with a deep understanding of key microeconomic concepts, focusing on utility theory, consumption, production, market structures, and general equilibrium. It covers utility functions and consumer decision-making, analyzing how budget constraints, income, and price changes affect consumption choices. Students will explore production theory, including different production functions, cost analysis, and the relationship between short-run and long-run costs. The course also examines various market structures, including perfect competition, monopoly, monopolistic competition, oligopoly, and monopsony, along with pricing strategies and market power. Additionally, students will learn about input markets, distribution theory, and the determination of input demand. The course concludes with a study of general equilibrium, efficiency, and welfare, covering Pareto optimality, market failures, and the role of property rights in economic efficiency.

Program Outcome:

Upon completing this course, students will have a thorough understanding of microeconomics theory and its application to real-world scenarios. They will be able to analyze consumer behaviour, including the effects of income and price changes on consumption decisions, and understand the principles of utility maximization and consumer equilibrium. Students will gain insights into production theory, cost analysis, and market structures, enabling them to assess different market conditions, pricing strategies, and the role of competition. Additionally, they will understand the functioning of input markets and distribution theory, as well as the concepts of general equilibrium, efficiency, and welfare, including market failures and the importance of property rights. Overall, students will be equipped with the analytical tools necessary to evaluate economic outcomes and make informed decisions in various economic contexts.

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END OF SEMESTER-III (MAJOR)

SYLLABUS FOR SEMESTER-IV MAJOR COURSES

Course Title: Macroeconomics with Mathematical Applications

Course Code: BECOMAJ04T

Credit: 6

Classes: 90

1. Simple Keynesian Model: (10)
Income Determination in Simple Keynesian System in closed

2. Classical Model: (10)
Classical System; Say's Law, Quantity Theory of Money; Classical Dichotomy and Neutrality of Money

3. Money Market: (15)
Motives for holding money---Transaction, Precautionary and Speculative; Liquidity Preference Theory of Keynes, Liquidity Trap; Determination of Equilibrium Interest Rate; Inventory Theoretic Approach to Transaction demand for money (of Baumol and Tobin); Friedman's Restatement of the demand for money.

4. IS-LM Model: (15)
Derivation of IS and LM curves; Determination of equilibrium income and interest rate; Stability of equilibrium; Comparative Static results; effects of fiscal and monetary policies; Real balance effects; Mundell- Fleming model; Mathematical Application
Economy

5. Consumption function: (10)
Kuznets Empirical finding; Relative Income Hypothesis; Life cycle hypothesis; Permanent Income Hypothesis; Mathematical Application, Stability of equilibrium, Investment Multiplier, Paradox of Thrift; Mathematical Application

6. Investment function: (10)
MEC and MEI; Gorgenson's neoclassical theory; Acceleration Principle---fixed and variable; Net present value criterion; Mathematical Application

7. Complete Keynesian System: (10)
Derivation of aggregate demand and aggregate supply; Determination of equilibrium output, employment, wage, price and interest rate; Mathematical Application

8. Inflation: (10)
Demand Pull and Cost Push Inflation; Trade-off between Inflation and Unemployment; Short run and Long run Phillips Curves under Adaptive Expectations

Reading References:

1. Mankiw, N., 2016, *Macroeconomics*, 9th edition, Worth Publishers.
2. Branson, W., 2013, *Macroeconomics*, Theory and policy, 3rd edition, East West Press.
3. Jones, C., 2016, *Macroeconomics*, 4th edition, W. W. Norton.
4. Blanchard, O., 2018, *Macroeconomics*, 7th edition, Pearson Education.
5. Abel, A., Bernanke, B., 2016, *Macroeconomics*, 9th edition, Pearson Education.
6. Errol D'Souza, 2009, *Macroeconomics*, Pearson Education , New Delhi.
7. Richard T. Froyen, 2016, *Macroeconomics*, Pearson education Asia, 10th edition.

8. Sikdar Soumen, *Principles of Macroeconomics*, Oxford University Press.
9. Ackley, *Macroeconomic Theory and Policy*, 2nd edition.
10. Monoronjan Dey, 1999, *Macroeconomics,* Dhakeswari Library, Dhaka.

Course Objective:

This course aims to provide a comprehensive understanding of key macroeconomic theories and models. It focuses on income determination, money market dynamics, and the interplay between fiscal and monetary policies. Students will explore foundational concepts such as the Simple Keynesian Model, the Classical Model, IS-LM framework, and Consumption and Investment functions. Key topics include the role of money, inflation dynamics, the Phillips Curve, and macroeconomic equilibrium. The course integrates theoretical insights with mathematical applications to analyze economic stability, policy implications, and behavioural patterns in a closed and open economy context.

Program Outcomes:

By the end of this course, students will develop a comprehensive understanding of key macroeconomic concepts and models, including the Simple Keynesian and Classical systems, income determination, and the dynamics of money markets. They will analyze the IS-LM framework and the Mundell-Fleming model to explore equilibrium in closed and open economies, incorporating real balance effects and the impact of fiscal and monetary policies. Students will evaluate theories of consumption and investment, such as the Relative Income Hypothesis, Life Cycle Hypothesis, and acceleration principles, alongside mathematical applications. Additionally, they will examine inflation dynamics, including demand-pull and cost-push factors, and the trade-off between inflation and unemployment using the Phillips Curve. Through these studies, students will gain the analytical skills and theoretical knowledge necessary to assess macroeconomic stability, policy effectiveness, and real-world economic challenges.

Course Title: Statistics –I
Course Code: BECOMAJ05T
Credit: 6
Classes: 90

GROUP A: ELEMENTARY MATHEMATICS FOR STATISTICS (40Lectures)

Unit 1: Set Theory (5)
a. Concept, Roster Method and Rule Method, Finite and Infinite Sets, Universal Set, Null Set, Subset & Superset, Complementary Set, Power Set;
b. Union, Intersection, and Subtraction of sets
c . Venn Diagram, Laws of Set Operations (to be explained using only Venn Diagrams)
d. Cardinality of Union of two and three sets (no algebraic proof is required, only concept using Venn Diagram) and simple applications

Unit 2: Elementary Algebra (12)
2.1 Permutations and Combinations (5)
(a) Concepts and elementary applications only
(b) Use of calculator
2.2: Binomial Theorem (2)

Expansion of $(a+b)^n$ where n is a positive integer, finding a particular term or its coefficient in the expansion, Relations of combinations obtained using Binomial Theorem (no proof is required throughout)

2.3: Exponential Function (1)

a. Introduction to e, functions in the form e^x, e^{-x}, $e^{1/x}$ and their graphs (first quadrant only); b.Use of Calculator

2.4: Logarithm (4)

a. Concept, Rules/Formulas (no proof is required), elementary numeric problems (with emphasis on, but not limited to, base 10 and e), elementary algebraic problems for application of rules/formulas;
b. Concept of anti-logarithm (no application);
c. Log-table and its use in finding values;
d. Use of Calculator in finding log and anti-log values.

Unit 3: Elementary concepts from calculus (23)

3.1 Functions (5)

Concept; Domain and Range of a function; Function of a Function; Graph of linear functions (detail); Graph of quadratic and cubic functions (in general, no particular functional form is to be used); introduction to logarithmic and exponential functions (no applications)

3.2 Limit & Continuity (1)

Concept; Existence of Limit; neither formulas nor applications

3.3 Differentiation (10)

(a) Concept; Existence; First Principle (no proofs/sums), formula of differentiation of only algebraic, exponential, and logarithmic functions (with elementary sums); differentiation of the sum, product, and ratio of functions (with elementary sums); introduction to chain rule and applications (up to multiplication of two derivatives)
(b) Introduction to and elementary sums on Double Differentiation
(c)Differentiation of functions of more than one independent variable – Introduction to and elementary sums on Partial Differentiation and Total Differentiation
(d)Concept of Maxima and Minima of functions of only one independent variable, and their conditions (no applications)

3.4 Integration (7)

Concept; basic formulas (only algebraic and exponential) and their elementary applications; method of substitution; integration by parts, concept of definite integral as area under a curve; simple applications (no formula involving logarithmic or trigonometric expressions are required throughout)

GROUP B: STATISTICS (50Lectures)

Unit 1: Elementary Statistics (10)

Axioms of Central Tendency; Theory of Dispersion; Skewness and Kurtosis; Mathematical Problems on Mean, Median, Mode, Range, Mean Deviation, Standard Deviation, Coefficient of Variation.

Unit 2: Bivariate Analysis (20)

a. Why study this unit, real life problems which can be answered after studying this unit; Bivariate data – concept, Scatter Diagram – Definition, Uses (2)
b. Pearson's Correlation Coefficient (5)
c. Simple Linear Regression – Concept, Derivation of Regression Equations using the Method of Least Squares (normal equations are to be derived using calculus, estimated parameters must be denoted using hats), Applications, Relation between Total Variation, Explained Variation, and Unexplained Variation (with proof), introduction to coefficient of determination (r^2) – Determination of angle between two regression lines is not required (10)
d. Spearman's Rank Correlation (both non-tied and tied cases) (3)

Unit 3: Index Number (20)

a. Why study this unit, real life problems which can be answered after studying this unit; Price Index Number – Concept, Definition, Uses. (6)

b. Aggregative and Relatives methods of calculating Price Index Numbers (Simple and Weighted Average of Price Relatives, Simple Aggregative Method, Weighted Aggregative Methods – Laspeyres, Paasche, Fisher, Marshall-Edgeworth), Tests for an ideal price index number (10)
c. Chain Base Index Numbers vs. Fixed Base Index Numbers, Introduction to Quantity Index Number (only concept, no applications) (2)
d. Cost of Living Index number – Concept, Uses, and Applications – Dearness Allowance, Real Wage, Real GDP (2)

Reading References:

Group A: Elementary Mathematics for Statistics

1. Relevant parts from the NCERT Class XI & XII Mathematics Books (OER).
2. Sanjay Mishra, 2021, *Fundamentals of Mathematics*, 2nd edition, GK Publication.
3. Garima Singh, 2020, *Mathematics (Volume I and II)*, AICTE Prescribed Textbook, Khanna Book Publishing Co. Ltd.
4. BC Das and BN Mukherjee, 1994, *Integral Calculus Including Differential Equations*, UN Dhar & Sons Private Ltd.
5. Arup Mukherjee, 2004, *Linear Programming and Numerical Analysis*, Shreetara Prakashani, Kolkata.

Group B: Statistics

1. Goon, A. M., Gupta, M. K., & Dasgupta, B., 2013, *Fundamentals of Statistics* (Volume I and II), The World Press Private Ltd.
2. NG Das, 2017, *Statistical Methods* (Combined Volume), McGraw Hill Education, Kolkata.
3. R.V. Hogg and A.T. Craig, *An Introduction to Mathematical Statistics*, Third Edition, Amerind, New York, London.
4. Mood, A.M., F.A. Greybill and D.C. Boes, 1974, *Introduction to the Theory of Statistics*, McGraw Hill.
5. John E. Freund, 1992, *Mathematical Statistics*, Prentice Hall.
6. R. Ganesan and PV Sreenivasaiah, 2015, *Textbook of Statistics*, Write and Print Publication, 1st edition.
7. SS Gupta and VK Kapoor, 2020, *Fundamentals of Mathematical Statistics*, 12th edition, Sultan Chand & Sons.

Course Objective:

This course aims to provide foundational knowledge of elementary mathematics and statistical methods essential for data analysis. Students will explore concepts in set theory, algebra, calculus, and their applications to understand mathematical tools like differentiation, integration, permutations, and combinations. The course also introduces key statistical concepts, including measures of central tendency, dispersion, bivariate analysis, and index numbers, emphasizing real-life applications. By integrating mathematical techniques with statistical reasoning, the course equips students with the skills to analyze data, interpret relationships, and apply quantitative methods in practical scenarios.

Program Outcomes:

1. By completing this course, students will gain a solid foundation in mathematical and statistical techniques critical for data analysis. They will understand and apply

concepts from set theory, algebra, calculus, and functions, and use these tools to solve problems involving differentiation, integration, and permutations.

2. Students will also develop the ability to analyze data using measures of central tendency, dispersion, bivariate analysis, and index numbers. This knowledge will enable them to interpret relationships, evaluate trends, and apply quantitative methods effectively in real-world scenarios.

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END OF SEMESTER-IV (MAJOR)

SYLLABUS FOR SEMESTER-V MAJOR COURSES

Course Title: Indian Economics and Development Economics - I
Course Code: BECOMAJ06T
Credit: 6
Classes: 90

Group A: Indian Economics (45)

1. Economic Development since Independence: (15)
Major features of the economy at independence; Planning and Evolution of India's development goals and strategies; An assessment of performance Sustainability and regional contrasts; Structural changes of the Indian Economy
Savings - investment paradox.
2. Population and Human Development: (10)
Demographic trends and issues; Issues in Education and Health
3. **Growth and Distribution: (10)**
Trends and policies in poverty including Sen's Entitlement Analysis; Inequality and Unemployment.
4. **Economic Reforms in India: (10)**
Monetary, Fiscal, and Trade Policy Reforms; 1st, 2nd and 3rd Generation of Economic Reforms.

Group B: Development Economics (45)
1. Meaning of Economic Development: (25)
International variations in development measures; Comparing development trajectories across nations and within them; Dependency school of development.
2. Economic Growth: (20)
An overview and policy implications of one sector growth models: Harrod-Domar, and Solow; Sources of economic growth; International comparisons.

Reading References:

Indian Economics:

1. K.L. Krishna and A. Vaidyanathan, *Institutions and Markets in India's Development.*
2. R. Datt & K.P.M. Sundaram, 2023, *Indian Economy*, S. Chand Publisher (Paperback: Gaurav Datt & Ashwani Mahajan).
3. A.N. Agarwal and M.K. Agarwal, 2019, *Indian Economy: Problems of Development and Plannning*, New Age International Pvt. Ltd.
4. Uma Kapila, *Indian Economy since Independence*, Academic Foundation.
5. Ahluwalia and Little, *India's Economic Reforms and Development*, OUP.
6. Joshi and Little, *India's Economic Reforms*, OUP.
7. D. Mukhopadhyay, 2011, *Globalization and Inequality*, Deep and Deep Publications Pvt. Ltd., New Delhi.
8. S. Pan, S. Ghosh and A. Karmakar, 2014, *Two Decades of Economic Reforms in India*, Regal Publications, New Delhi.
9. Sanjiv Verma, 2022, *The Indian Economy*, Unique Publishers Pvt. Ltd, New Delhi.
10. Sukhomoy Chakraborty, *Development Planning: The Indian Experience*, OUP.

Development Economics:

1. Jean Dreze and Amartya Sen, 2013, *An Uncertain Glory: India and its Contradictions*, Princeton University Press.

2. Jean Dreze and Amartya Sen, *Economic Development and Social Opportunity*, OUP.
3. R.J. Chelliah, 2009, *Towards Sustainable Growth*, OUP.
4. VC Sinha and S. Pandeya, 2021, *Planning and Economic Development*, SBPD Publications.
5. Debraj Ray, 2009, *Development Economics*, Oxford University Press.
6. Partha Dasgupta, 2007, *Economics: A Very Short Introduction*, Oxford University Press.
7. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee, 2006, *Understanding Poverty*, Oxford University Press.
8. Kaushik Basu, 2007, *The Oxford Companion to Economics in India*, OUP.
9. Amartya Sen, 2000, *Development as Freedom*, OUP.

Course Objective:

This course aims to provide students with a comprehensive understanding of India's economic development, population dynamics, and development economics. It begins with an exploration of India's economic conditions at independence, examining the evolution of development goals, strategies, and structural changes in the economy, as well as the paradox of savings and investment. The course delves into issues related to population and human development, focusing on demographic trends, education, and health. It also analyzes poverty, inequality, and unemployment, alongside economic reforms in India, including monetary, fiscal, and trade policy changes. In the development economics section, students will study the meaning of economic development, international variations, and the dependency theory, followed by an overview of economic growth models like Harrod-Domar and Solow, with a focus on sources of economic growth and international comparisons.

Program Outcomes:

1. Upon completing this course, students will gain a deep understanding of India's economic development journey, including the major features of the economy at independence, the evolution of development strategies, and the challenges related to savings and investment. They will be able to assess issues related to population growth, human development, and the role of education and health in shaping economic outcomes. The course will also equip students to critically evaluate poverty, inequality, and unemployment trends, and understand the impact of India's economic reforms.

2. In development economics, students will be able to compare development trajectories across nations, understand key growth models, and analyze sources of economic growth and their implications for policy. Ultimately, students will be well-prepared to analyze and apply development theories and strategies in the context of both India and the global economy.

Course Title: Trade Theory and Public Economics

Course Code: BECOMAJ07T

Credit: 6

Classes: 90

Group A: Trade Theory (45)

1.Basics of Trade Theory: (10)
Arbitrage as basis and direction of trade; Fundamental sources of cross-country price differences and arbitrage; Concept of comparative advantage; Externalities, regulation and perverse comparative advantage; International equilibrium; offer curves; ToT and stability; Gains from Trade (GFT) Theorem; Concepts of Production possibility Frontier and Community Indifference curves; Illustration of GFT; Decomposition of GFT; Substitution possibilities and magnitude of GFT.

2.**Technology and Trade (Ricardian Model): (15)**
Comparative versus Absolute Advantage; One-factor economy, production possibility frontier; Relative demand and relative supply; Terms of trade; Trade in Ricardian world; Determination of intermediate ToT; Complete specialization & GFT.

3.Factor Endowment & Trade (Heckscher-Ohlin-Samuelson Model): (20)
H-O theorem and physical vs. price definitions of factor abundance; Properties of the HO model Factor intensity ranking; One-to-one correspondence between commodity price ratio & factor price ratio (Stolper-Samuelson theorem); One to one correspondence between endowment ratio and production proportion (Rybczysky's theorem); Proof of HO theorem; Taste bias and invalidation of HO theorem; Empirical studies - Leontief Paradox; Effects of trade on factor price and income distribution; factor price equalization; factor intensity reversal & factor price equalization.

Group: B Public Economics (45)

1. Nature and Scope of Public Economics: (15)
Market Failure and Government Intervention; Coase Theorem; Public Expenditure to finance Development.

2. Theory of Public Good: (15)
Optimal provision of Public Goods; Private Provision and Public Provision of Public Goods; Lindahl Equilibrium; Voting Equilibrium.

3. Taxation: (15)
Benefit Principle; Equal Sacrifice Principle; Ability to Pay Principle; Incidence and Burden of Taxes; Effects of taxation on income distribution; Work efforts, and on savings; The Laffer curve; Optimal Taxation.

Reading References:

<u>Trade Theory</u>:

- P. Krugman and M. Obstfeld, *International Economics, 8*th Edition, Pearson Education.
- R. Caves, J. Frankel and R.W. Jones, *World Trades & Payments,* 9th Education, Pearson Education.
- Rajat Acharyya, *International Economics;* Oxford University Press.
- Giancarlo Gandolfo, 2014, *International Trade Theory and Policy*, Springer.
- Anne O. Krueger, 2020, *International Trade: What Everyone Needs to Know*, OUP.

<u>Public Economics:</u>

- A.B. Atkinson and J.E. Stiglitz, 1980, *Lectures on Public Economics*, McGraw-Hill Inc.,US.
- C.V. Brown and P.M. Jackson, 1991, *Public Sector Economics*, Wiley-Blackwell; 4th Edition.
- J.F. Due and A.F. Friedlander, 1994, *Government Finance-Economics of Public Sector,* AITBS Publishers and Distributors.
- J. Hindriks and G.D. Myles, 2006, *Intermediate Public Economics*, The MIT Press; Annotated Edition.
- R.A. Musgrave and P.B. Musgrave, 1989, *Public Finance in Theory & Practice*, McGraw Hill Publications, 5th edition.
- Amaresh Bagchi, *Readings in Public Finance*, OUP.
- J.E. Stiglitz, 2000, *Economics of Public Sector,* W. W Norton and Company, 3rd Edition.

- R.J. Chelliah, 2009, *Towards Sustainable Growth*, OUP.
- H.L. Bhatia, 1977, *Public Finance*, Vikas Publishing House, new Delhi.
- A. Ghosh and C. Ghosh, 2014, *Public Finance*, Prentice Hall India Learning Private Limited; 2nd Revised edition.
- S. Mukherjee, A. Ghose and R.N. Nag, 2008, *Analytical Public Finance*, New Central Book Agency, Kolkata

Course Objective:

The course aims to provide a comprehensive understanding of trade theory and public economics. It begins with the basics of trade theory, exploring concepts such as arbitrage, comparative advantage, externalities, and the gains from trade, with a focus on the production possibility frontier and community indifference curves. Students will analyze the Ricardian model of trade, comparing absolute and comparative advantages, and understanding the role of terms of trade and specialization. The course further delves into the Heckscher-Ohlin-Samuelson model, covering factor endowment, factor intensity, and empirical studies like the Leontief Paradox, and examining the effects of trade on factor prices and income distribution. On the public economics side, the course introduces market failure, government intervention, and public expenditure, while exploring the theory of public goods and the provision of public and private goods. Lastly, it covers taxation, focusing on principles like the benefit, equal sacrifice, and ability-to-pay principles, as well as analyzing the incidence, burden, and effects of taxation on income distribution, work efforts, and savings, including the Laffer curve and optimal taxation.

Program Outcomes:

1. By the end of this course, students will have a comprehensive understanding of both trade theory and public economics. They will be able to analyze the fundamental concepts of trade, such as arbitrage, comparative advantage, externalities, and gains from trade, and apply models like the Ricardian and Heckscher-Ohlin-Samuelson models to evaluate trade dynamics, factor endowment, and the effects of trade on income distribution and factor prices.

2. Additionally, students will gain insights into public economics, including the concepts of market failure and government intervention, and will be able to critically evaluate the provision of public goods, including private versus public provision and Lindahl equilibrium. They will also develop a deep understanding of taxation principles, including the benefit, equal sacrifice, and ability-to-pay principles, and will be able to assess the effects of taxation on income distribution, work efforts, and savings. The course will equip students with the analytical tools needed to evaluate trade policies and public economic interventions effectively.

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END OF SEMESTER-V (MAJOR)

SYLLABUS FOR SEMESTER-VI MAJOR COURSES

Indian Economics & Development Economics – II
BECOMAJ08T
Credit: 6
Classes: 90

Group A: Indian Economics (45)

1. WTO and India: (20)
Different rounds of trade negotiations Macroeconomic Policies and Their Impact; Fiscal Policy; Trade and investment policy; Financial and monetary policies; Inflation and measures to control inflation; Labour laws and regulation; SEZ Policies and Performance in Agriculture.
2. Growth, Productivity and India: (15)
Agrarian structure and technology; Capital formation; Food Security and Food Policy; Pricing and Procurement; Globalization and Indian Agriculture; Policies and Performance in Industry Growth; Productivity; Diversification; Small scale industries; Public sector; Competition policy.
3. Foreign Investment and Insurance: (10)
Foreign Aid vs Foreign Investment; FDI & FII; Formal and Informal Sectors; Banking and Insurance; Trade in Services; Foreign Investment, Globalization and Indian Industry; Trends and Performance in Services.

Group B: Development Economics (45)

1. Poverty and Inequality: (20)
Inequality axioms; A comparison of commonly used inequality measures; Gender Inequality; Connections between inequality and development; Poverty measurement; HPI; Poverty traps and path dependence of growth processes.
2. **Political Institutions and the State: (25)**
Definition of Institutions; Evolution of Political and Economic Institutions; The determinants of democracy; Alternative institutional trajectories and their relationship with economic performance; Within-country differences in the functioning of state institutions; State ownership and regulation; Government failures and corruption.

Reading References:

Indian Economics:

1. RK Sen and JF Raj, 2009, *WTO & Asian Union*, Deep and Deep Publications Pvt. Ltd, New Delhi.
2. Kaushik Basu and A. Maertens, 2013, *The New Oxford Companion to Economics in India*, Oxford University Press.
3. Uma Kapila, *Indian Economy since Independence*, Academic Foundation.
4. Ahluwalia and Little, *India's Economic Reforms and Development*, OUP.
5. Jean Dreze and Angus Deaton, 2009, "Food and Nutrition in India: Facts and Interpretations", in *Economic and Political Weekly*, February.
6. Himanshu, 2011, "Employment Trends in India: A Re-examination", *Economic and Political Weekly*, September.
7. Geeta G. Kingdon, 2007, "The Progress of School Education in India", *Oxford Review of Economic Policy*.
8. J.B.G. Tilak, 2007, "Post Elementary Education, Poverty and Development in India", *International Journal of Educational Development.*
9. R. Datt & K.P.M. Sundaram, 2023, *Indian Economy*, S. Chand Publisher (Paperback: Gaurav Datt & Ashwani Mahajan).

10. S. Pan, 2013, *Foreign Direct Investment and Indian Economy,* Regal Publications, New Delhi.

Development Economics:

1. Jean Dreze and Amartya Sen, 2013, *An Uncertain Glory: India and its Contradictions*, Princeton University Press.
2. Jean Dreze and Amartya Sen, *Economic Development and Social Opportunity*, OUP.
3. Sukhomoy Chakraborty, *Development Planning: The Indian Experience*, OUP.
4. Kaushik Basu and A. Maertens, 2013, *The New Oxford Companion to Economics*, Oxford University Press.
5. R.J. Chelliah, 2009, *Towards Sustainable Growth*, OUP.
6. VC Sinha and S. Pandeya, 2021, *Planning and Economic Development*, SBPD Publications.
7. Debraj Ray, 2009, *Development Economics*, Oxford University Press.
8. Partha Dasgupta, 2007, *Economics: A Very Short Introduction*, Oxford University Press.
9. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee, 2006, *Understanding Poverty*, Oxford University Press.
10. Kaushik Basu, 2007, *The Oxford Companion to Economics in India*, OUP.
11. Amartya Sen, 2000, *Development as Freedom*, OUP.

Course Objective:

This course aims to provide students with a comprehensive understanding of India's economic policies and their relationship with global trade, growth, and development. It covers key topics such as India's involvement in WTO trade negotiations, the impact of macroeconomic policies like fiscal, trade, investment, and monetary policies, as well as inflation control measures and labor laws. The course also explores India's growth and productivity, focusing on agrarian structure, food security, industry growth, small-scale industries, and competition policies. Students will analyze foreign investment, including FDI and FII, and their effects on India's industry and services. In development economics, the course delves into poverty, inequality, and gender disparities, alongside the role of political institutions, state regulation, and the impact of government failures and corruption on economic outcomes.

Program Outcomes:

1. Upon completing this course, students will have a thorough understanding of India's economic policies, particularly in relation to global trade and development. They will be able to analyze the impact of fiscal, trade, investment, and monetary policies on India's economy, as well as the role of labor laws, SEZ policies, and agriculture. Students will gain insights into the country's growth dynamics, including agrarian structure, food security, and industrial productivity, while also understanding the effects of globalization on various sectors.

2. They will also be equipped to evaluate foreign investment trends, the role of foreign aid, and the performance of services. In development economics, students will gain a critical understanding of poverty, inequality, and gender disparities, and will be able to assess the role of political institutions in shaping economic outcomes and their relationship to government performance.

Course Title: Trade Policy and Public Finance

Course Code: BECOMAJ09T

Credit: 6

Classes: 90

Group A: Trade Policy (45)

1.Trade Policy: (20)
Partial Equilibrium Analysis; Tariff-cost–benefit; Quota; Quota-Tariff equivalence & non-equivalence; Effects of tariff, quota, subsidy and voluntary export restraint; General Equilibrium Analysis; Distinction between large and small economy; Welfare effects of a tariff on small country and large country; Offer curve and ToT; Tariff ridden offer curve; Tariff war; Optimum tariff for large economy; Metzler's Paradox.
2. **Balance of Payments & Exchange Rate: (25)**
Balance of Payment accounts in an open economy; Determination of National Income; Transfer problem; Introduction of foreign Country & repercussion effect; Open economy multiplier with & without repercussion effect; Fixed &Flexible Exchange Rate: Adjustment of demand and supply of Foreign Exchange; FDI and Trade; Effect of devaluation; Effects of exchange rate on domestic prices and ToT; Marshall-Lerner Condition; J-Curve effect.

Group B: Public Finance (45)

1. Public Expenditure: (30)
Meaning and Classification of Public Expenditure; Government budget and its types; Government Expenditure and tax multipliers; Balanced budget multiplier; Fiscal Federalism in India, Indian Budgetary System.
2. Public Debt: (15) Meaning of Public Debt; Sources of Public Borrowings: Internal and external borrowing; Effects of Public Debt. Public Debt & Indian Experience

Reading References:

Trade Policy:

- P. Krugman and M. Obstfeld, 2017, *International Economics, 8*th Edition, Pearson Education.
- R. Caves, J. Frankel and R.W. Jones, 2006, *World Trades & Payments: An Introduction*, 10th Education, Pearson Education.
- Rajat Acharyya, 2013, *International Economics;* Oxford University Press.
- Giancarlo Gandolfo, 2014, *International Trade Theory and Policy*, Springer.
- Anne O. Krueger, 2020, *International Trade: What Everyone Needs to Know*, OUP.
- S. Pan and R.K Sen, 2007, *Foreign Direct Investment and Trade in India*, Deep and Deep Publications Pvt. Ltd, New Delhi.
- H. Bangia, 2023, *Foreign Trade Policy,* Agarwal Law House.
- P.K. Rai and J. Kumar, 2021, *Foreign Trade of India*, Orange Books Publication, 1st Edition.

Public Finance:

- A. B. Atkinson and J. E. Stiglitz, 1980, *Lectures on Public Economics*, McGraw-Hill Inc.,US.
- C. V. Brown and P. M. Jackson, 1991, *Public Sector Economics*, Wiley-Blackwell; 4th Edition.
- J. F. Due and A. F. Friedlander, 1994, *Government Finance-Economics of Public Sector*, AITBS Publishers and Distributors.

- J. Hindriks and G. D. Myles, 2006, *Intermediate Public Economics*, The MIT Press; Annotated Edition.
- R.A. Musgrave and P.B. Musgrave, 1989, *Public Finance in Theory & Practice*, McGraw Hill Publications, 5th edition.
- Amaresh Bagchi, *Readings in Public Finance*, OUP.
- J. E. Stiglitz, 2000, *Economics of Public Sector*, W. W Norton and Company, 3rd Edition.
- R.J. Chelliah, 2009, *Towards Sustainable Growth*, OUP.
- H.L. Bhatia, 1977, *Public Finance*, Vikas Publishing House, New Delhi.
- A. Ghosh and C. Ghosh, 2014, *Public Finance*, Prentice Hall India Learning Private Limited; 2nd Revised edition.
- S. Mukherjee, A. Ghose and R.N. Nag, 2008, *Analytical Public Finance*, New Central Book Agency, Kolkata.

Course Objective:

The course aims to provide an in-depth understanding of trade policy and public finance. It explores trade policy through partial and general equilibrium analysis, examining the effects of tariffs, quotas, subsidies, and voluntary export restraints, and addressing the welfare impacts on both small and large economies. The course also covers complex topics such as tariff wars, optimum tariffs for large economies, and Metzler's Paradox. Additionally, it delves into the balance of payments and exchange rate systems, including the determination of national income in an open economy, the effects of devaluation, and the relationship between exchange rates and domestic prices, as well as the Marshall-Lerner Condition and J-Curve effect. In the area of public finance, the course examines the classification of public expenditure, the role of government budgets and fiscal policies, fiscal federalism in India, and the impact of public debt, including its sources, effects, and implications in the Indian context. By the end of the course, students will be equipped with the tools to analyze trade policies, balance of payments, exchange rate systems, public expenditure, and debt in both domestic and international economic environments.

Program Outcomes:

1. By the end of this course, students will have a comprehensive understanding of trade policy and public finance. They will be able to analyze the effects of various trade policies, including tariffs, quotas, and subsidies, and understand their welfare implications for both small and large economies. Students will gain insights into the dynamics of the balance of payments, exchange rate systems, and the impact of exchange rate fluctuations on domestic prices and terms of trade. They will also learn to apply concepts like the Marshall-Lerner Condition and the J-Curve effect.

2. In the area of public finance, students will develop the ability to evaluate public expenditure, government budgeting processes, fiscal federalism, and the effects of public debt, with a focus on India's experience. This course will equip students with the analytical tools necessary to assess trade policies, exchange rate mechanisms, and public finance issues in both domestic and global economic contexts.

Course Title: Statistics – II
Course Code: BECOMAJ10T
Credit: 6
Classes: 75

Unit 1: Probability: (15)
(a) Why study this unit, real life problems which can be answered after studying this unit; Random Experiment, Trial, Outcome, Event, Mutually Exclusive Events, Exhaustive Events, Equally Likely Events, Complementary Events (1)
(b) Classical Definition of Probability and its limitations, Applications (2)
(c) Axiomatic Approach to Probability – Rationale, Sample space and events, Additive Theorem of Probability for two and three events, Applications (2)
(d) Conditional Probability, Independence of Events – Definition, Concept, Applications (2)
(e) Bayes' Theorem – Statement, Proof, Applications (2)
(f) Probability Distribution – Random/Stochastic Variable, Expectation, Variance, Applications (3)
(g) Joint Probability Distribution (only for discrete variable) – Concept, Applications (3)
Note: Calculations of permutation and combinations are not to be shown in answers, they can be found using calculators

Unit 2: Theoretical Distributions: (18)

(a) Why study this unit, real life problems which can be answered after studying this unit; Probability Function – pmf and pdf, their properties, Applications (2)
(b) Distribution Function – Definition, Derivation of distribution function from probability function and vice versa (for both discrete and continuous variables) (2)
(c) Binomial Distribution – Uses, Properties (derivation of mean, variance and mode only), Applications (2)
(d) Poisson Distribution – Uses, Properties (derivation of mean, variance and mode only), Applications, Poisson Distribution as a limiting case of Binomial Distribution (2)
(e) Normal Distribution – Uses, Properties (proofs not required), Standard Normal Variable & its properties (proofs not required), Applications (3)
(f) Fitting of Binomial, Poisson, and Normal Distributions to observed distributions (goodness of fit is not to be checked here) (3)
(g) Hypergeometric, Uniform and Rectangular Distributions – Concept only (no properties, no applications) (1)
(h) Factorial Moments and Moment Generating Functions – Purpose, Definition, derivation and application of Moment Generating Functions for Binomial and Poisson Distributions (3)
Note: While answering, values of e^a are to be found using calculators; calculations of permutation and combinations are not to be shown in answers, they can be found using calculators

Unit 3: Sampling Theory: (6)

a. Why study this unit, real life problems which can be answered after studying this unit; Difference between Population and Sample, Advantages and Disadvantages of sample survey over population survey, Principal steps in a sample survey (1)
b. Random and non-random sampling techniques, SRSWR and SRSWOR – Properties, Method of drawing samples using Random Numbers, introduction to Random Number Tables (2)
c. Difference between Parameter and Statistic, Sampling Distribution, Numeric problems on calculation of Expectation and Standard Error from Sampling Distribution, Derivation of Expectation and Standard Error of Sample Mean and Sample Proportion under SRSWR and SRSWOR (3)

Unit 4: Statistical Inference: (32)

(a) Why study this unit, real life problems which can be answered after studying this unit; Purpose of Inferential Statistics, concept and difference between estimation and testing of hypothesis, difference between test of hypothesis and test of significance (1)

(b) Difference between point estimation and interval estimation, difference between OLS estimation, MLM, and Method of Moments (1)
(c) Properties of a good estimator, MVUE, BLUE, Applications (only numeric problems, no theoretical proofs) (3)
(d) Maximum-Likelihood-Estimation – Definition, Properties (no application), Method of Moments – only concept (1)
(e) Null and Alternative Hypothesis, One-tailed and Two-tailed Tests, Type I and Type II Errors, power of a test, confidence interval, level of significance, critical region, region of acceptance, p-value, steps in testing of hypothesis (4)
(f) Concept of Degrees of Freedom (1)
(g) z, t, χ^2, and F Distributions – Definition and Properties (no proof), how to find values from distribution tables (2)
(h) Scope of application of z, t, χ^2, and F statistic in hypothesis testing – which one is to be used in what situation (2)
(i) Numeric problems only on application of z and t statistic in hypothesis testing, derivation of confidence interval for population mean and proportion and their application, use of t in checking goodness of fit of normal distribution to observed distribution (8)
(j) Application of χ^2 statistic and Fisher's Exact Test for testing independence of two attributes, and in checking goodness of fit of Binomial and Poisson Distributions to observed distribution (2)
(k) ANOVA (only one-way) – Purpose, Steps, Applications (6)
(l) ANOVA (two-way) – only introductory concept (no detailed discussion, nor applications) (1)

Unit 5: Vital Statistics: (4)

a. Why study this unit, real life problems which can be answered after studying this unit; Different measures of Birth, Death, and Fertility rates (2)
b. Life Table – Uses, construction, and simple applications (2)

Reading References:

1. Goon, A. M., Gupta, M. K., & Dasgupta, B.,2013, *Fundamentals of Statistics (Volume I and II)*, The World Press Private Ltd.
2. Mood, A.M, Graybill, F. A, & Boes, D.C., 1974, *Introduction to The Theory of Statistics*, McGraw Hill.
3. John E. Freund, 1992, *Mathematical Statistics*, Prentice Hall.
4. R. Ganesan and PV Sreenivasaiah, 2015, *Textbook of Statistics*, Write and Print Publication, 1st edition.
5. SS Gupta and VK Kapoor, 2020, *Fundamentals of Mathematical Statistics*, 12th edition, Sultan Chand & Sons.
6. NG Das, 2017, *Statistical Methods* (Combined Volume), McGraw Hill Education, Kolkata.
7. R.V. Hogg and A.T. Craig, *An Introduction to Mathematical Statistics*, Third Edition, Amerind, New York, London.
8. Shantilal R. Patel, 2021, *Statistical Inference*, IK International Pvt. Ltd.
9. Robert V. Hogg, Elliot Tanis and Dale Zimmerman, 2020, *Probability and Statistical Inference*, Pearson India.

Course Objective:

The course aims to provide students with a comprehensive understanding of statistical methods and their applications in real-life scenarios. It covers key concepts in probability, including random experiments, classical and axiomatic probability, conditional probability, Bayes' Theorem, and probability distributions like binomial, Poisson, normal, and others. Students will also learn about sampling theory, including random sampling techniques and sampling distributions, as well as the differences between population and sample data. The course further explores statistical inference, including estimation methods, hypothesis testing,

confidence intervals, and various statistical tests such as z, t, $\chi 2$, and F distributions. Additionally, students will gain insights into vital statistics, including birth, death, and fertility rates, and will be introduced to the use of life tables. The course equips students with the necessary statistical tools to perform data analysis, make inferences, and apply statistical methods to real-world problems.

Program Outcomes:

By the end of this course, students will have developed a strong foundation in statistical concepts and techniques, enabling them to effectively apply them to real-world problems. They will be proficient in probability theory, understanding concepts such as random experiments, conditional probability, Bayes' Theorem, and various probability distributions like binomial, Poisson, and normal. Students will also gain expertise in sampling theory, learning to calculate expectations, standard errors, and understand sampling distributions. In statistical inference, they will be able to perform hypothesis testing, calculate confidence intervals, and apply various statistical tests, including z, t, $\chi 2$, and F tests. Furthermore, students will be equipped to analyze vital statistics, construct and use life tables, and apply their statistical knowledge to fields like economics, social sciences, and public health. This course will prepare students for practical data analysis and the application of statistical methods in diverse research and professional contexts.

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END OF SEMESTER-VI (MAJOR)

SYLLABUS FOR SEMESTER-VII MAJOR COURSES

Course Title: Advanced and Applied Microeconomics
Course Code: BECOMAJ11T
Credit: 6
Classes: 45

1. Consumer Choices & Uncertainty: (20)
Consumer's Surplus; Willingness to pay; Compensating and Equivalent Variation; Intertemporal Choice. The Envelope Theorem and Duality: Comparative Static Analysis , Concepts of Lotteries, Applications; Axioms of choice under uncertainty, Expected Utility Function and its properties, Expected Utility Theorem and its proof, Violations of Expected Utility Theorem – paradoxes. Preferences towards risk, Reducing risk – diversification, Insurance, value of information, Dynamic Optimization Theory, Lagrangian vs Hamiltonian. Control theoretic problem. Use of Hamiltonian-finite and infinite time horizon cases with discrete and continuous time points.

2. Market Behaviour, Social Choice & Game Theory: (25)
Static Games of Complete Information, Strictly dominated strategy, Pure and mixed strategy Nash equilibrium, Dynamic Games of Complete Information , Backwards induction outcome, Sub-game perfect Nash equilibrium, Oligopoly Models (Game theoretic approach)Cournot, Bertrand, Stackelberg, and Collusive Oligopoly. The Two Basic Theorems of Welfare Economics, Kaldor-Hicks Criteria for Welfare Improvement, Introduction to the Theory of Social Choice.

Reading References:

- Kreps, D.M., l990, A *Course in Microeconomic Theory,* Princeton University Press.
- Layard, P.R.G. and Walters, A.W., 1988, *Microeconomic Theory,* McGrawHill, New York.
- Mass-Colell, A., Whinston, M. and Green, J., 1995, *Microeconomic Theory*, Oxford University Press, New Delhi.
- Chakravarty S.R., 2010, *Microeconomics*, Allied Publishers Pvt Ltd.
- Hansen, B., 1970, *A Survey of General Equilibrium Systems,* McGraw-Hill Book Co.
- Sen, A., 1999, *Microeconomics; Theory and Applications, Oxford University Press, New Delhi.*
- Varian, H., 2000, *Microeconomic Analysis, W.W. Norton, New York*
- Quirk, J. and Saposnik, R., 1968, *Introduction to General Equilibrium Theory and Welfare Economics*, McGraw Hill, New York.
- Henderson, J.M. and Quandt, R.E., 1980, *Microeconomic Theory: A Mathematical Approach,* 3rd Edition, McGraw-Hill Book Company.
- Silberberg E and Suen, W., *The Structure of Economics - A Mathematical Analysis*, 3rd edition, McGraw Hill Publishing Company, International Edition.
- Johnson, S.R., Hassan, Z.A. and Green, R.D., *Demand Systems Estimations*, The Iowa State University Press, Ames.
- Malinvaud, E., 1976, *Lectures on Microeconomic Theory,* North Holland Publishing Company.
- Graff, J.D.E.V. ,1975, *Theoretical Welfare Economics*, Vikas Publishing House.
- Bator, M. F., 1957, "The Simple Analysis of Welfare Maximisation", *American Economic Review*, Vol 47, Reprinted in Townsend (ed): *Readings in Price Theory*, Penguin.
- Simon, C.P. and Blume, L., 1994, *Mathematics for Economists*, W. W. Norton & Company.
- Chiang, A.C., 1986, *Fundamental Methods of Mathematical Economics*, McGraw Hill, New York.
- Chiang, A. C., 1992, *Elements of Dynamic Optimization*, McGraw-Hill, Inc.
- Conrad, J.M. and Clark, C.W., 1987, *Natural Resource Economics: Notes and Problems*, Cambridge University Press.

- Allen, R.G.D., 1974, *Mathematical Analysis for Economists*, Macmillan Press and ELBS, London.
- D. Fudenberg and J. Tirole, *Game Theory*, MIT Press.
- J.J. Laffont and D. Martimort, *Theory of Incentives: The Principal Agent Model*, Princeton University Press.
- M. Osborne and A. Rubinstein, *A Course in Game Theory*, MIT Press
- Mas-Colell, M. Whinston and J. Green, *Microeconomic Theory*, Oxford University Press,1995.
- Robert Gibbons, 1992, *A Primer in Game Theory,* Princeton University Press.
- Erik Rasmusen, 1999, *Games and Information: An Introduction to Game Theory*, Basil Blackwell.
- K. Binmore, 1991, *Fun and Games: A Text on Game Theory*, OUP.

Course Objective:

This course aims to provide students with an in-depth understanding of consumer behavior, uncertainty, market dynamics, and game theory in economics. It covers topics such as consumer surplus, intertemporal choice, and comparative static analysis, along with the Envelope Theorem and concepts of risk and uncertainty, including expected utility and paradoxes. Students will explore dynamic optimization using Lagrangian and Hamiltonian methods, applied to both finite and infinite time horizons. The course also delves into market behavior, social choice theory, and game theory, including static and dynamic games of complete information, Nash equilibria, and oligopoly models. Additionally, students will examine welfare economics, the Kaldor-Hicks criteria for welfare improvement, and the basics of social choice theory.

Program Outcomes:

Upon completing this course, students will have a strong grasp of advanced economic theories related to consumer behavior, uncertainty, market dynamics, and game theory. They will be able to analyze consumer choices under uncertainty, apply dynamic optimization techniques using Lagrangian and Hamiltonian methods, and understand the implications of risk and diversification. Students will also gain expertise in game theory, including the analysis of Nash equilibria in both static and dynamic games, and apply these concepts to oligopoly models and social choice theory. Additionally, students will be able to evaluate welfare economics and use criteria like Kaldor-Hicks to assess welfare improvements, preparing them to tackle complex economic problems involving uncertainty, market behavior, and strategic decision-making.

Course Title: Advanced and Applied Macroeconomics
Course Code: BECOMAJ12T
Credit: 6
Classes: 90

1. Disequilibrium Models, Rational Expectations Theory & New Keynesian Macroeconomics:(30)

Disequilibrium Models: Patinkin, Clower and Barro-Grossman. The Rational Expectations Theory: Meaning , Differences with Adaptive Expectations. The Lucas Imperfect Information Model, Implications and Limitations. The Phillips Curve and Lucas critique. Mundell-Fleming versions under fixed and flexible exchange rates.World capital Market equilibrium.

2. The Solow-Swan Model & International Financial Markets and Crises: (30)

Steady-state equilibrium, Golden Rule of capital accumulation, Impact of technological progress. Absolute versus conditional convergence , Neutrality of Technical Progress and Returns to scale-different types of technological progress. Integration and efficiency of international financial markets, Modigliani- Miller Theorem –leverage and cost of bankruptcy.

3. Modern Theory of Growth & Exchange Rate and Capital Flow: (30)

Dissatisfaction with neoclassical theory, One sector models of endogenous growth: the AK model. Endogenous growth and human capital formation: the Lucas model. Endogenous growth and R&D-Romer model. Alternative exchange rate regimes-an overview; Capital flow to developing countries and its macroeconomic implications; Some useful models of exchange rate dynamics

Reading References:

1. Dasgupta D.,1998, *The Macro Economy : A Text Book View*, Oxford University Press, New Delhi.
2. Dornbusch, R. 1980, *Open Economy Macroeconomics*, Cambridge University Press.
3. Barro, R.I. and Grossman, H.I., 1971, "A General Disequilibrium Model of Income and Employment", *American Economic Review*, March,Vol. 61(1):82-93.
4. Mueller, M.G., 1978, *Readings in Macroeconomics*, Surjeet Publications, New Delhi.
5. Blaug, M., 1978, *Economic Theory in Retrospect*, Cambridge University Press.
6. Ackley, G.,1978, *Macroeconomics: Theory and Policy*, Macmillan, New York.
7. Rakshit, M., 1987, *Money, Credit and Monetary Policy*, SBI Lectures.
8. Levacic, R. and Rebman, A., 1986, *Macroeconomics;* 2nd Edition, Macmillan.
9. Froyen, R.T., 2007, *Macroeconomics: Theories and Policies*, 8th Edition, Pearson Education.
10. Sen, A. 1960, *Growth Economics*, Harmonds worth, Penguin Books.
11. Romer, D., 2001, *Advanced Macroeconomics*, McGraw-Hill International Edition.
12. Mankiw, N.G. and D. Romer, 1991, *New Keynesian Economics*, 2 volumes, MIT Press, Cambridge.
13. Romer, D., 2001, *Advanced Macroeconomics*, McGraw-Hill International Edition.
14. Lucas, R.E Jr., 1988, "On the Mechanics of Economic Development", *Journal of Monetary Economics*, 22 (July): 3-42.

Course Objective:

The paper prepares to create special skills of the students over macroeconomic theories. The further developed issue on disequilibrium macroeconomics and modern growth models are discussed with most up to date manner.

Program Outcomes:

By the end of this course, students will develop a comprehensive understanding of key macroeconomic concepts and models, including disequilibrium Models, Rational Expectations Theory & New Keynesian, The Solow-Swan Model & International Financial Markets and Crises and Modern Theory of Growth & Exchange Rate and Capital Flow.

Course Title: Econometrics – I
Course Code: BECOMAJ13T
Credit: 6
Classes: 90

1. Two Variable CLRM: (15)
Estimation , Gauss-Markov Theorem, alternative measures of goodness of fit. Inference . Prediction
2. Violation of CLRM: (15)
Heteroscedasticity, Nature of the problem, Consequences, Detection, Possible solutions, Autocorrelation.Nature of the problem, Consequences, Detection, Possible solutions
3. **Problem due to Nature of Regressors:** (15)
Multicollinearity, Nature of the problem, Consequences, Detection of multicollinearity, and Possible solutions.
4. Regression with Qualitative Regressors: (15)
Dummy Independent Variables –Use; Classification system; Dummy Variable Trap; Interpretation of estimated coefficients; Class-effect and Interaction-effect; Testing structural stability of regression models comparing two regressions, Estimating seasonal effects, ANOVA vs ANCOVA, piecewise linear regressions
5. Computer Application: (Open Source Software) (30)
Basic Regression Analysis. Factor Analysis

Reading References:

- Johnston, J., 1977 and 1984, *Econometric Methods*, 2nd and 3rd Editions, McGraw-Hill.
- Johnston, J. and Dinardo, J., 1997, *Econometric Methods*, 4th Edition, McGraw-Hill International Edition.
- Maddala, G.S., 1988, *Introduction to Econometrics*, Macmillan, London.
- Maddala, G.S., 1997, *Econometrics*, McGraw Hill, New York.
- Gujarati, D.N., 1995, *Basic Econometrics*, 4th Edition, McGraw Hill, New Delhi.
- Wooldrige, J.M., 2009, *Econometrics*, Cengage Learning, India Edition
- Nachane, D.M., 2006, *Econometrics: Theoretical Foundations and Empirical Perspectives*, Oxford University Press, New Delhi.
- Greene, W.H., 2000, *Econometric Analysis*, Prentice Hall International.
- Desai, M., 1976, *Applied Econometrics*, P. Allen.
- Klein, L.R., 1975, *A Text Book of Econometrics*, Prentice Hall, New Delhi.
- Intrilligator, M.D., 1978, *Econometric Methods, Techniques and Applications*, Prentice Hall, New Jersey.
- A. Koutsoyiannis, 1996, *Theory of Econometrics*, ELBS with Macmillan.

Course Objective:

The objective of this course is to provide students with advanced knowledge and practical skills in econometric modeling techniques, focusing on CLRM, violation of CLRM, nature of regressors, and Open source software.

Program Outcome:

To Provide Basic Knowledge in Data Handling with econometric methods. To empower the students in analyzing the data behaviour with econometric methods. To understand the data handling problems and econometric interpretation**.**

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END OF SEMESTER-VII (MAJOR)

SYLLABUS FOR SEMESTER-VIII MAJOR COURSES WITHOUT RESEARCH

Course Title: Environmental and Resource Economics
Course Code: BECOMAJ14T
Credit: 6
Classes: 60

Environmental Economics: Concepts; Review of Microeconomics and Welfare Economics; Theory of Externalities, Pareto Optimality and Market Failure; Property Rights and the Coase Theorem (10)
1. Environmental Policy: Design and Implementation; Pigouvian Taxes and Effluent Fees; Tradable Permits; Transaction Costs (10)
2. Environmental Problems: Trans-boundary Environmental Problems; Economics of Climate Change; Partial Equilibrium Model of Trade and Environment (10)
3. Valuation and Evaluation: Measurement with Cost-Benefit Analysis of Environmental Improvements; Non-Market values and measurement methods; risk assessment and perception. Concepts of Sustainable Development; MDG (10)
4. Resource Economics: Ecological Economics; Environmental Macroeconomics; Energy-Economy-Environment Model; Natural Resource Accounting; Renewable and Non-renewable Resources (10)
5. Ecological Economics: Interdisciplinary Issues; Ethical Aspects; Energy, Value, Ecology and Economics (5)
6. Environmental Models: Input-Output Analysis; General Equilibrium Model; Game Theory; Decomposition Methodology (5)

Reading References:

►Rabindra N. Bhattacharya, 2002, *Environmental Economics: An Indian Perspective,* Oxford India Paperbacks.
►Jeroean C.J.M. van den Bergh, 1999, *Handbook of Environmental and Resource Economics*, Edward Elgar Publication.
►Charles Kolstad, 2010, *Intermediate Environmental Economics,* Oxford University Press, 2nd edition.
► Robert N. Stavins, 2005, *Economics of the Environment: Selected Readings,* W.W. Norton, 5th edition.
► Roger Perman, Yue Ma, James McGilvray and Michael Common, 2003, *Natural Resource and Environmental Economics,* Pearson Education/Addison Wesley, 3rd edition.
► Maureen L. Cropper and Wallace E. Oates, 1992, *Environmental Economics: A Survey Journal of Economic Literature,* Volume 30:675-740.
►Ulaganathan Sankar, 2001, *Environmental Economics*, Oxford India Paperbacks.
►Katar Sing and Anil Shishodia, 2007, *Environmental Economics: Theory and Applications*, Sage Publications.
►Pranab Mukhopadhyay, Nandan Nawn, Kalyan Das, 2017, *Global Change, Ecosystems, Sustainability: Theory, Methods, Practice, SAGE Publication India.*
►Jon M. Conrad, 2010, *Resource Economics,* Cambridge University Press, 2nd Edition, ISBN: 9780521697675.
►Steven C. Hacket, 1997, *Environmental and Natural Resource Economics*, Taylor & Francis, ISBN: 9780765601094.
► N. Ghosh, P. Mukhopadhyay, A. Shah and M. Panda, 2016, *Nature, Economy and Society: Understanding and Linkages*, Springer Publications.
► J. Bandyopadhyay, K. Chopra and N. Ghosh, 2012, *Environmental Governance: Approaches, Imperatives and Methods*, Bloomsbury Publication.
►Conrad, J.M. and Clark, C.W., 1987, *Natural Resource Economics: Notes and Problems*, Cambridge University Press.

Course Objective:

The objective of this course is to provide students with a comprehensive understanding of environmental economics, focusing on the intersection of economic theory, environmental issues, and policy design. It covers foundational concepts such as externalities, Pareto optimality, market failure, and property rights, with an emphasis on the Coase Theorem. The course explores the design and implementation of environmental policies, including Pigouvian taxes, effluent fees, tradable permits, and transaction costs. It addresses global environmental challenges like climate change and trans-boundary issues using economic models. Students will learn to evaluate environmental improvements through cost-benefit analysis and understand sustainable development concepts. Additionally, the course covers resource economics, ecological economics, and environmental models, preparing students to analyze and address complex environmental and resource management issues.

Program Outcomes:

1. Upon completing this course, students will have a strong understanding of environmental economics and its applications to real-world environmental challenges. They will be able to analyze market failures and externalities, apply the Coase Theorem, and evaluate the effectiveness of various environmental policies such as Pigouvian taxes, tradable permits, and effluent fees. Students will gain the ability to assess environmental improvements through cost-benefit analysis, and understand non-market valuation techniques and the principles of sustainable development.

2. Additionally, students will be equipped to tackle issues related to resource economics, ecological economics, and climate change using advanced economic models, such as input-output analysis and general equilibrium models, making them proficient in addressing complex environmental policy and resource management problems.

Course Title: Social Sector Studies
Course Code: BECOMAJ15T
Credit: 6
Classes: 60

1. Health Economics: (15)
Role of Health in Human Development; Importance in Poverty Alleviation; Health Outcomes; Microeconomic Foundations of Health Economics; Demand for Health; Uncertainty and Health Insurance Market; Evaluation of Health Programs; Burden of Disease; Health Sector in India: An Overview; Health Systems; Health Financing.
2. Economics of Education: (15)
Investment in Human Capital; Rate of Return to Education: Private and Social; Quality of Education; Signaling or Human Capital; Theories of Discrimination; Education Sector in India:An Overview; Literacy Rates, School Participation, School Quality Measures.
3. Gender Studies: (15)
Feminist Movement, Gender and Development; Women and Work; Growth of Women Studies in India; Gender Based Violence; Social Status of Women in India.
4. Demographic Studies: (15)

Introduction and Sources of Population Data; Methods of Demographic Analysis; Population Composition and Change; Nuptiality and Fertility; Mortality, Morbidity and Health; Urbanization and Migration.

Reading References:

►Mukta S. Adi, *An Introduction to Health Economics*, ISBN: 9789384803438
►William, Jack, 1999, *Principles of Health Economics for Developing Countries*, World Bank Institute Development Studies.
►The World Bank, 1993, *World Development Report: Investing in Health*.
►Ronald G., Ehrenberg and Robert S., Smith, 2005, *Modern Labour Economics: Theory and Public Policy*, Addison Wesley.
►Samuel Akinyemi, 2013, *The Economics of Education*, Strategic Book Publishing, ISBN: 978-1612042008.
►Fayaz Ahmed Bhat and Kulsuma Gill, *An Introductory Economics of Education*, Kalpaz Publication, ISBN: 9789386397690.
►Manjunatha K.M., 2022, *Gender Studies*, ISBN: 9789391542634.
►Jyoti Prasad Saikia, 2017, *Gender: Themes and Issues*, ISBN: 978-9351252832.
►Asha A. Bhende, and Tara Kanilkar, *Principles of Population Studies*, Himalaya Publishing House.
►Rathindra P. Sen, *Demographic Change and Levels of Living*, ISBN: 9788170350514.
►F. Raj, S. Mukherjee, M. Mukherjee, A. Ghosh and RN Nag, 2011, *Contemporary Development Economics: From Adam Smith to Amartya Sen*, New Central Book Agency, Kolkata.

Course Objective:

The objective of this course is to provide students with a thorough understanding of the economic dimensions of health, education, gender, and demographics. It covers the role of health in human development, its importance in poverty alleviation, and the economic foundations of health demand and health insurance markets. The course explores the economics of education, focusing on human capital investment, the rate of return to education, and theories of discrimination. It also addresses key gender issues, including the feminist movement, gender and development, and the social status of women in India. In demographic studies, students will learn about population data, demographic analysis methods, and trends in fertility, mortality, migration, and urbanization. This course aims to equip students with the analytical tools necessary to understand and address critical social and economic issues.

Program Outcomes:

Upon completing this course, students will have a comprehensive understanding of the economic aspects of health, education, gender, and demographics. They will be able to analyze the role of health in human development and poverty alleviation, assess health outcomes, and evaluate health programs. Students will gain insight into the economics of education, including the rate of return to education and quality measures. They will also be equipped to critically examine gender-related economic issues, such as gender-based violence, the role of women in the workforce, and the growth of women's studies in India. Additionally, students will acquire the ability to conduct demographic analysis, focusing on population composition, fertility, mortality, and migration patterns, and apply these skills to real-world social and economic challenges. This course will prepare students for policy analysis and advocacy in areas related to human development.

Course Title: Econometrics – II

Course Code: BECOMAJ16T
Credit: 6
Classes: 60

1. Limited Dependent Variable Models: (12)
Linear Probability Model, Logit Model, Probit Model. Specification Issues in Binary Response Models
2. Simultaneous Equation System: (12)
Forms of Simultaneous Equation System, Identification Problem. The concept of identification with economic examples. Observationally equivalent structure. Order and Rank Conditions. Estimation Problem. Consequences of estimating simultaneous equation system by OLS method. Unbiasedness and consistency of estimator-use of the concept of plim. Recursive system. ILS estimator with properties, IV estimator with properties,
3. Basics of Time Series Econometrics: (12)
Properties of time series, ACF and PACF - Some Useful Processes ,White Noise, Random Walks, MA Processes, AR Processes, ARMA Processes and ARIMA Processes. ARIMA models-identification, estimation, diagnostic testing, Analysis of Time Series and Box-Jenkins Method, Barlett's test, Box-pierce Q-test, Ljung-Box test, Unit Root Tests, Trend Stationary and Difference Stationary process, Forecasting- MA(1), ARMA(1,1) and ARIMA(1,1,0) processes, Seasonality
4. Modeling with Trends: (12)
Deterministic and stochastic trends, Removing the trend, Spurious Regression, Cointegration: General cointegrated system, Error correction model and tests for cointegration; Cointegration in single equations- Engle-Granger method, CRDW test, System estimation method – Johansen procedure
5. Basics of Panel Data: (12)
Sources and Types of Panel Data , Pooled Estimator , Random Effect Model, Fixed Effect Model . Fixed versus Random Effects Model & Hausmann Test. Dynamic Panel

Reading References:

- Johnston, J., 1977 and 1984, *Econometric Methods*, 2nd and 3rd Editions, McGraw-Hill.
- Johnston, J. and Dinardo, J., 1997, *Econometric Methods*, 4th Edition, McGraw-Hill International Edition.
- Hamilton, J. D. ,1994, *Time Series Analysis*, Princeton University Press.
- Granger, C.W.J. and Newbold, P., 1977, *Forecasting Economic Time Series*, 2nd Edition, Academic Press.
- Greene, W.H., 1997, *Econometric Analysis*, 3rd Edition, Prentice Hall.
- Gujarati, D.N., 1995, *Basic Econometrics*, 4th Edition, McGraw-Hill, New Delhi.
- Enders, W., 2004, *Applied Econometric Time Series*, Wiley.
- Maddala, G.S., 1997, *Econometrics*, McGraw Hill, New York.

Course Objective:

The objective of this course is to equip students with advanced econometric techniques for analyzing complex data structures, focusing on limited dependent variable models, simultaneous equation systems, time series econometrics, and panel data analysis. It covers the application of models like the Linear Probability, Logit, and Probit models, addressing specification issues in binary response models. The course also explores simultaneous equation systems, including identification problems and advanced estimation methods such as Instrumental Variables (IV) and Instrumental Least Squares (ILS). Students will gain

proficiency in time series analysis, including ARMA, ARIMA models, and diagnostic tests. Additionally, the course covers trend modeling, cointegration, and error correction models, as well as panel data analysis techniques, such as the Fixed Effect and Random Effect models. The course aims to provide students with the tools necessary to analyze and interpret economic data effectively.

Program Outcomes:

Upon completing this course, students will have developed the skills to apply advanced econometric methods to real-world economic data. They will be proficient in analyzing limited dependent variables using models like Logit and Probit and addressing specification issues in binary response models. Students will gain expertise in handling simultaneous equation systems, understanding identification problems, and applying estimation techniques such as IV and ILS. They will be able to analyze time series data using ARMA, ARIMA models, and diagnostic tests, as well as apply trend analysis and cointegration techniques, including the Engle-Granger method and Johansen procedure. Additionally, students will become adept at working with panel data, using Fixed and Random Effect models and performing Hausmann tests. Overall, the course will equip students with the analytical tools to handle complex econometric problems and interpret economic data effectively.

Course Title: Rural-Urban Economics
Course Code: BECOMAJ17T
Credit: 6
Classes: 90

Group A: Rural Economics (45)

1. Introduction to Rural Economics: (5)
Meaning and Objectives of Rural economy; Characteristics of Rural Economy; Indicators of Rural Development; Concepts of inclusive and sustainable development.
2. Approaches to Rural Development: (5)
Gandhian Model; Community Development Approach; Minimum Needs Approach; Integrated Rural Development and Inclusive Growth Approach.
3. Poverty and Unemployment in Rural India: (5)
Meaning and Measurement of Poverty; Causes of Poverty; Farm and Non-farm employment Measurement and Types of rural unemployment; Review of rural Poverty Alleviation and Employment Generation Programmes in India.
4. Rural Enterprises: (5)
Meaning and Importance; Classification of MSME; Progress and Problems of MSME; Khadi and Village Industries
5. Rural Banking and Finance: (5)
Credit Co-operative Societies Regional Rural Banks; Role of NABARD; Microfinance Institutions
6. Rural Infrastructure: (5)
Educational and Health Infrastructure Housing and Sanitation; Drinking Water Supply; Rural Transport and Communication Rural Electrification
7. Rural Development Programmes: (5)

Wage Employment Programmes; Self-employment and Entrepreneurship Development Programmes Rural Housing Programmes; Rural Sanitation Programmes

8. Rural Markets: (5)

Meaning and Types of Rural Markets; Defects and Government Measures for Removal of Defects in rural markets Co-operative Marketing Societies; Meaning and Importance of Regulated Markets; Digital Marketing (e-NAM)

9. Rural Governance (5)

Legislations powers; Functions, and sources of revenue of Panchayat Raj Institutions Role of NGOs in rural development ; People's participation in rural development

Group B: Urban Economics (45)

1. Introduction to Urban Economics: (5)

Definition and Scope of Urban Economics; Nature of Urban Economics Definition of Urban Area; Causes of urbanization- Sub-urbanisation; Characteristics of urban area; Concept of urban

2 . Models of Urban Development and Planning (10)

The Urban Economy and Development Strategy; The Economics of Urban Growth; Models of Urban Growth; **Concentric Zone Theory, Wedge or Radial Sector Theory, Components of Hoyt Model, Multiple-Nuclei Theory, Central Place Theory, Weber's Theory of Location, *Public Choice Theory,* Planning Theories** The Frontiers of Urban Growth; The Economics of Intra-urban Location Decisions- Residential and industrial locations Semi urban areas special townships-Features of Urbanization in Developing Countries; Land Acquisition and Resettlement Act.

3. Urban Local Government (5)

Types of local bodies and Governance; Special Areas Improvement Trust: Functions, Problems and limitations; Slums Areas: Locations and Problems; Slum development policy

4 Urban Poverty: (5)

Problems, Measures, and Policies; The Nature of Urban Poverty; The Causes of Poverty; Urban Crime and management

5. Labour Market in Urban Area (5)

Urban labour markets; Developed and developing economies; Informal sector; Segmentation and hierarchy; Dualism; Impact of globalization; Urbanization without labour absorption in India.

6.**Urban Development in India (5)**

Urbanization in India; Growth of Urban Population; Urban Development Policy in India Policies and Programmes under the Plans; Jawaharlal Nehru National Urban Renewal Mission (JNNURM).

7. Issues in Urban Infrastructural Development and environmental problems (5)

Issues in Urban infrastructure; Housing, health, education and sanitation; Transport bottlenecks. Smart city mission; Urban environmental problems; slums, pollution, Solid Waste Management; Urbanisation and sustainable development.

8. Inter-relation between Rural and Urban Study (5)

Common features of Rural and urban economy; Distinctive features of Rural and urban economy; Todaro Model of Rural-Urban Migration and Unemployment

Reading References:

<u>Rural Economics:</u>

1. Chambers, R., 1983, *Rural Development: Putting the Last First*, Longman, Harlow.
2. Dandekar, V.M. and N. Rath, 1971, *Poverty in India*, GIPE, Pune.
3. Gupta. K .R., 2003, *Rural Development in India*, Atlantic Publishers and Distributors, New Delhi.
4. Karalay, G. N., 2005, *Integrated Approach to Rural Development: Polices, Programmes and Strategies*, Concept Publishing Company, New Delhi.
5. Tyagi, B. P., 1998, *Agricultural Economics and Rural Development*, Jai Prakash Math and Co., Meerut.
6. S. Bhushan, R. Pushap and S. Lal, 2023, *Economics of Rural Development*, VK Publishing House.
7. S.S. Nain and V. Mehata, 2017, *Introduction to Agricultural Economics*, CBS Publishers and Distributors.

Urban Economics:

1. O'Sullivan, A., 2002, *Urban Economics*, McGraw-Hill Irwin.
2. Fred Durr, 1971, *The Urban Economy*, Index Educational Publishers, London.
3. Todaro Michael P, *Internal Migration in Developing Countries: A Review of Theory, Evidence, Methodology & Research Priorities*, ILO Geneva.
4. Hartwick, John M., 2015, *Urban Economics*, Routledge; 1st edition.
5. Shukla, V., 1996, *Urbanization and Economic Growth*, Himalaya Publishers
6. Government of India, 2019, *Handbook of Urban Statistics*, Ministry of Housing and Urban Affairs, New Delhi.
7. J.K. Brueckner, 2013, *Lectures on Urban Economics*, Phi Publishers.

Course Objective:

The course on Rural and Urban Economics aims to provide students with a comprehensive understanding of both rural and urban economies. It focuses on the key characteristics, challenges, and opportunities in rural development, including poverty, unemployment, rural enterprises, and rural banking. Students will explore various models and approaches to rural development, such as the Gandhian model and Integrated Rural Development, and examine the role of infrastructure, governance, and markets in rural areas. The urban economics section delves into the dynamics of urbanization, urban growth models, urban local governance, urban poverty, and labor markets. It also covers the development of urban infrastructure, environmental challenges, and policies in India, with an emphasis on the interrelation between rural and urban economies, and migration patterns. The course prepares students to analyze the complex relationship between rural and urban areas and address the challenges faced in both settings.

Program Outcomes:

1. The course outcomes aim to equip students with the ability to critically analyze the key aspects of both rural and urban economies. Students will develop a strong understanding of rural development, including poverty alleviation, employment generation, and the role of infrastructure, governance, and markets. They will gain the skills to assess various models and strategies for rural development, such as Gandhian and Integrated Rural Development approaches.

2. In the context of urban economics, students will be able to examine urban growth patterns, local government functions, urban poverty, labour markets, and infrastructure challenges. Additionally, students will be able to evaluate the interconnection between rural and urban areas, particularly regarding migration and economic disparities, and analyze policies related to urban development in India. Ultimately, students will be prepared to address both rural and urban development issues with a comprehensive, integrated approach.

Course Title: Money and Financial Economics
Course Code: BECOMAJ18T
Credit: 6
Classes: 90

1. Money: (10)
Barter System; Introduction of Money; Paper Currency and Bank Money; Concept, functions, measurement; Theories of money supply determination.
2. Financial Institutions: (25)
Markets, Instruments and Financial Innovations; Role of financial markets and institutions; Problem of asymmetric information – adverse selection and moral hazard; Financial crises.
3. Money and Capital Markets: (15)
Organization, structure and reforms in India; Role of financial derivatives and other innovations; Financial Markets and Interest Rates Behaviour; Determination; Sources of interest rate differentials; theories of term structure of interest rates; interest rates in India.
4. Banking System: (25)
Balance sheet and Portfolio management; Multiple Deposit Creation, Determinants of the Money Supply; Indian Banking System: Changing role and structure; Banking sector reforms.
5. Central Banking and Monetary Policy: (15)
Functions, balance sheet; Goals, targets, indicators and instruments of monetary control; Monetary management in an open economy; Current monetary policy of India; Central Bank Digital Currency; Crypto currency.

Reading References:

1. F.S. Mishkin and S. G. Eakins, 2009, *Financial Markets and Institutions*, Pearson Education, 6th edition.
2. F.J. Fabozzi, F. Modigliani, F. J. Jones, M. G. Ferri, 2009, *Foundations of Financial Markets and Institutions*, Pearson Education, 3rd edition.
3. M.R. Baye and D. W. Jansen, 1996, *Money, Banking and Financial Markets*, AITBS.
4. Rakesh Mohan, 2011, G*rowth with Financial Stability: Central Banking in an Emerging Market*, Oxford University Press.
5. L.M. Bhole and J. Mahukud, 2011, *Financial Institutions and Markets*, Tata McGraw Hill, 5th edition.
6. M.Y. Khan, 2011, *Indian Financial System*, Tata McGraw Hill, 7th edition.
7. N. Jadhav, 2006, *Monetary Policy, Financial Stability and Central Banking in India*, Macmillan.
8. CAE Goodhart, 1985, *Money Information and Uncertainty*, Springer Publication.
9. D. Bhowmik, 2022, *An Approach Towards Central Bank Digital Currency*, Kunal Books, New Delhi.
10. R.B.I., 1998, *Report of the Working Group: Money Supply Analytics and Methodology of Compilation.*
11. R.B.I. Bulletin, *Annual Report and Report on Currency and Finance*.

Course Objective:

The course aims to provide students with a comprehensive understanding of the key concepts and functions related to money, banking, and financial systems. It covers the evolution of money, including the transition from barter to modern financial instruments, and the role of financial institutions in markets and economic development. Students will explore the structure and reforms of money and capital markets, with a focus on interest rates and financial derivatives. The course also emphasizes the importance of banking systems, including balance sheet management, money supply, and banking reforms, with particular attention to the Indian banking system. Additionally, students will examine central banking functions, monetary policy, and the impact of digital currencies and cryptocurrencies in the context of India's current monetary landscape.

Program Outcome:

1. Upon completing this course, students will have gained a strong understanding of the functions and concepts related to money, financial institutions, and banking systems. They will be equipped to analyze the role of money in the economy and understand the theories and determinants of money supply. Students will also be able to assess the structure and functioning of financial markets, the impact of financial innovations, and the role of interest rates in economic decisions.

2. Additionally, they will have the skills to critically examine the banking system, including its reforms and the role of central banks in monetary policy. Finally, students will be able to evaluate the emerging trends in digital currencies and their implications for the financial system.

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END OF SEMESTER-VIII (MAJOR WITHOUT RESEARCH)

SYLLABUS FOR SEMESTER-VIII MAJOR COURSES WITH RESEARCH

Course Title: Environmental and Resource Economics
Course Code: BECOMAJ14T
Credit: 6
Classes: 60

Environmental Economics: Concepts; Review of Microeconomics and Welfare Economics; Theory of Externalities, Pareto Optimality and Market Failure; Property Rights and the Coase Theorem (10)

1. **Environmental Policy**: Design and Implementation; Pigouvian Taxes and Effluent Fees; Tradable Permits; Transaction Costs (10)
2. **Environmental Problems:** Trans-boundary Environmental Problems; Economics of Climate Change; Partial Equilibrium Model of Trade and Environment (10)
3. **Valuation and Evaluation:** Measurement with Cost-Benefit Analysis of Environmental Improvements; Non-Market values and measurement methods; risk assessment and perception. Concepts of Sustainable Development; MDG (10)
4. **Resource Economics:** Ecological Economics; Environmental Macroeconomics; Energy-Economy-Environment Model; Natural Resource Accounting; Renewable and Non-renewable Resources (10)
5. **Ecological Economics:** Interdisciplinary Issues; Ethical Aspects; Energy, Value, Ecology and Economics (5)
6. **Environmental Models:** Input-Output Analysis; General Equilibrium Model; Game Theory; Decomposition Methodology (5)

Reading References:

►Rabindra N. Bhattacharya, 2002, *Environmental Economics: An Indian Perspective*, Oxford India Paperbacks.
►Jeroean C.J.M. van den Bergh, 1999, *Handbook of Environmental and Resource Economics*, Edward Elgar Publication.
►Charles Kolstad, 2010, *Intermediate Environmental Economics*, Oxford University Press, 2nd edition.
► Robert N. Stavins, 2005, *Economics of the Environment: Selected Readings*, W.W. Norton, 5th edition.
► Roger Perman, Yue Ma, James McGilvray and Michael Common, 2003, *Natural Resource and Environmental Economics*, Pearson Education/Addison Wesley, 3rd edition.
► Maureen L. Cropper and Wallace E. Oates, 1992, *Environmental Economics: A Survey Journal of Economic Literature*, Volume 30:675-740.
►Ulaganathan Sankar, 2001, *Environmental Economics*, Oxford India Paperbacks.
►Katar Sing and Anil Shishodia, 2007, *Environmental Economics: Theory and Applications*, Sage Publications.
►Pranab Mukhopadhyay, Nandan Nawn, Kalyan Das, 2017, *Global Change, Ecosystems, Sustainability: Theory, Methods, Practice, SAGE Publication India.*
►Jon M. Conrad, 2010, *Resource Economics*, Cambridge University Press, 2nd Edition, ISBN: 9780521697675.
►Steven C. Hacket, 1997, *Environmental and Natural Resource Economics*, Taylor & Francis, ISBN: 9780765601094.
► N. Ghosh, P. Mukhopadhyay, A. Shah and M. Panda, 2016, *Nature, Economy and Society: Understanding and Linkages*, Springer Publications.
► J. Bandyopadhyay, K. Chopra and N. Ghosh, 2012, *Environmental Governance: Approaches, Imperatives and Methods*, Bloomsbury Publication.
►Conrad, J.M. and Clark, C.W., 1987, *Natural Resource Economics: Notes and Problems*, Cambridge University Press.

Course Objective:

This course aims to provide students with a comprehensive understanding of environmental economics, focusing on the intersection of economic theory, environmental policy, and sustainable development. It covers key concepts such as externalities, Pareto optimality, market failure, property rights, and the Coase Theorem. Students will explore environmental policy tools, including Pigouvian taxes, effluent fees, tradable permits, and transaction costs. The course also examines critical environmental issues, such as trans-boundary environmental problems, climate change, and the economics of trade and the environment. Additionally, students will learn to evaluate environmental improvements through cost-benefit analysis, understand non-market values, and address concepts like sustainable development and the Millennium Development Goals (MDG). The course further explores ecological economics, resource economics, and environmental models, providing students with the tools to analyze and address complex environmental challenges.

Program Outcomes:

Upon completing this course, students will have a strong understanding of environmental economics and its application to real-world challenges. They will be equipped to analyze environmental problems through the lens of economic theory, evaluating externalities, market failures, and the role of property rights in addressing environmental issues. Students will gain expertise in designing and implementing environmental policies, including taxes, fees, tradable permits, and transaction cost considerations. They will also be able to assess the economic implications of climate change, trans-boundary environmental problems, and trade. Additionally, students will learn to apply cost-benefit analysis to environmental improvements, understand sustainable development concepts, and explore interdisciplinary issues in ecological economics. Finally, students will acquire skills in using environmental models, such as input-output analysis and game theory, to address complex ecological and economic challenges.

Course Title: Social Sector Studies
Course Code: BECOMAJ15T
Credit: 6
Classes: 60

1. Health Economics: (15)
Role of Health in Human Development; Importance in Poverty Alleviation; Health Outcomes; Microeconomic Foundations of Health Economics; Demand for Health; Uncertainty and Health Insurance Market; Evaluation of Health Programs; Burden of Disease; Health Sector in India: An Overview; Health Systems; Health Financing.
2. Economics of Education: (15)
Investment in Human Capital; Rate of Return to Education: Private and Social; Quality of Education; Signaling or Human Capital; Theories of Discrimination; Education Sector in India:An Overview; Literacy Rates, School Participation, School Quality Measures.
3. Gender Studies: (15)
Feminist Movement, Gender and Development; Women and Work; Growth of Women Studies in India; Gender Based Violence; Social Status of Women in India.

4. Demographic Studies: (15)
Introduction and Sources of Population Data; Methods of Demographic Analysis; Population Composition and Change; Nuptiality and Fertility; Mortality, Morbidity and Health; Urbanization and Migration.

Reading References:

►Mukta S. Adi, *An Introduction to Health Economics,* ISBN: 9789384803438
►William, Jack, 1999, *Principles of Health Economics for Developing Countries*, World Bank Institute Development Studies.
►The World Bank, 1993, *World Development Report: Investing in Health*.
►Ronald G., Ehrenberg and Robert S., Smith, 2005, *Modern Labour Economics: Theory and Public Policy*, Addison Wesley.
►Samuel Akinyemi, 2013, *The Economics of Education*, Strategic Book Publishing, ISBN: 978-1612042008.
►Fayaz Ahmed Bhat and Kulsuma Gill, *An Introductory Economics of Education*, Kalpaz Publication, ISBN: 9789386397690.
►Manjunatha K.M., 2022, *Gender Studies*, ISBN: 9789391542634.
►Jyoti Prasad Saikia, 2017, *Gender: Themes and Issues*, ISBN: 978-9351252832.
►Asha A. Bhende, and Tara Kanilkar, *Principles of Population Studies*, Himalaya Publishing House.
►Rathindra P. Sen, *Demographic Change and Levels of Living*, ISBN: 9788170350514.
►F. Raj, S. Mukherjee, M. Mukherjee, A. Ghosh and RN Nag, 2011, *Contemporary Development Economics: From Adam Smith to Amartya Sen*, New Central Book Agency, Kolkata.

Course Objective:

The objective of this course is to provide students with a comprehensive understanding of the economic aspects of health, education, gender, and demographics. It covers key topics in health economics, including the role of health in human development, the importance of health in poverty alleviation, and health financing. Students will explore the economics of education, focusing on human capital investment, the rate of return to education, and the quality of education. The course also delves into gender studies, examining feminist movements, gender-based violence, and the social status of women, with a focus on India. Additionally, students will learn demographic analysis, including the study of population composition, fertility, mortality, migration, and urbanization.

Program Outcomes:

Upon completion of the course, students will have a deep understanding of how health, education, and demographic factors influence economic development. They will be equipped to assess the impact of health policies, the economics of education, and the role of gender in development. Students will be able to analyze demographic trends and their implications for policy. The course will enable them to apply these concepts in real-world scenarios, preparing them to contribute to social and economic development initiatives, particularly in the context of India.

Course Title: Econometrics – II
Course Code: BECOMAJ16T
Credit: 6
Classes: 60

1. Limited Dependent Variable Models: (12)
Linear Probability Model, Logit Model,Probit Model,Specification Issues in Binary Response Models

2. Simultaneous Equation System: (12)

Forms of Simultaneous Equation System, Identification Problem. The concept of identification with economic examples. Observationally equivalent structure. Order and Rank Conditions, Estimation Problem. Consequences of estimating simultaneous equation system by OLS method. Unbiasedness and consistency of estimator-use of the concept of plim. Recursive system. ILS estimator with properties, IV estimator with properties,

3. Basics of Time Series Econometrics: (12)

Properties of time series, ACF and PACF - Some Useful Processes , White Noise, Random Walks, MA Processes, AR Processes, ARMA Processes and ARIMA Processes. ARIMA models-identification, estimation, diagnostic testing, Analysis of Time Series and Box-Jenkins Method, Barlett's test, Box-pierce Q-test, Ljung-Box test, Unit Root Tests, Trend Stationary and Difference Stationary process, Forecasting- MA(1), ARMA(1,1) and ARIMA(1,1,0) processes, Seasonality

4. Modeling with Trends: (12)

Deterministic and stochastic trends, Removing the trend, Spurious Regression, Cointegration: General cointegrated system, Error correction model and tests for cointegration; Cointegration in single equations- Engle-Granger method, CRDW test, System estimation method – Johansen procedure

5. Basics of Panel Data: (12)

Sources and Types of Panel Data , Pooled Estimator , Random Effect Model, Fixed Effect Model , Fixed versus Random Effects Model & Hausmann Test, Dynamic Panel

Reading References:

- Johnston, J., 1977 and 1984, *Econometric Methods,* 2nd and 3rd Editions, McGraw-Hill.
- Johnston, J. and Dinardo, J., 1997, *Econometric Methods,* 4th Edition, McGraw-Hill International Edition.
- Hamilton, J. D. ,1994, *Time Series Analysis,* Princeton University Press.
- Granger, C.W.J. and Newbold, P., 1977, *Forecasting Economic Time Series,* 2nd Edition, Academic Press.
- Greene, W.H., 1997, *Econometric Analysis,* 3rd Edition, Prentice Hall.
- Gujarati, D.N., 1995, *Basic Econometrics,* 4th Edition, McGraw-Hill, New Delhi.
- Enders, W., 2004, *Applied Econometric Time Series,* Wiley.
- Maddala, G.S., 1997, *Econometrics,* McGraw Hill, New York.

Course Objective:

The objective of this course is to provide students with advanced knowledge and practical skills in econometric modeling techniques, focusing on limited dependent variable models, simultaneous equation systems, time series econometrics, trend modeling, and panel data analysis. It covers the linear probability model, logit and probit models, and issues related to binary response models. The course explores simultaneous equation systems, including identification problems, estimation methods such as IV and ILS, and the consequences of using OLS. Students will also gain an understanding of time series analysis, including ARMA, ARIMA, and unit root tests, along with diagnostic tools like the Box-Jenkins method. The course delves into trend modeling, cointegration, error correction models, and panel data techniques, providing students with a comprehensive toolkit for econometric analysis and modeling.

Program Outcomes:

Upon completing this course, students will have a solid understanding of advanced econometric techniques and their applications in real-world data analysis. They will be proficient in analyzing limited dependent variables using models like the linear probability,

logit, and probit models, and addressing specification issues in binary response models. Students will gain expertise in handling simultaneous equation systems, understanding identification problems, and using advanced estimation methods such as IV and ILS. They will also be capable of applying time series econometrics, including ARMA, ARIMA models, and conducting diagnostic tests. Additionally, students will be skilled in trend modeling, cointegration analysis, and error correction models. They will also understand panel data techniques, including fixed and random effects models, and be able to apply these methods to dynamic panel data. This course prepares students to tackle complex econometric problems and enhance their analytical capabilities for economic modelling and forecasting.

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END OF SEMESTER-VIII (MAJOR WITH RESEARCH)

ECONOMICS UG MINOR SYLLABUS FOR NEP

SYLLABUS FOR ECONOMICS MINOR OF SEMESTER-II

Course Title: Microeconomics

Course Code: BECOMEB12T

Credit: 4

Classes: 60

1. Introduction to Economics: (5)
Why study economics? Scope and Method of Economics; Scarcity and Efficiency; Basic Questions of Economics

2. Demand and Supply: (15)

a. Elementary theory of demand: Determinants of household demand, market demand, and shifts in the market demand curve
b. Elementary theory of supply: Factors influencing supply, derivation of the supply curve, and shifts in the supply curve
c. The elementary theory of market price: Determination of equilibrium price in a competitive market; The effect of shifts in demand and supply; Consumer surplus, Elasticity

3. The Households: (10)
The consumption decision - budget constraint, consumption and income and price changes, demand for all other goods and price changes; income and substitution effects; Price consumption curve, income consumption curve.

4. Cost and Revenue: (10)
Total, marginal and average cost; Opportunity Cost; Revenue curves in perfect and imperfect market

5. Market Structure: (10)
Equilibrium in the Perfect Competition; Monopoly; Monopolistic Competition.

6. Distribution Theory: (10)
Land and Rent; Labour and Wages; Capital and Interest; Entrepreneur and Profit.

Reading References:

► Dominick Salvatore, 2003, *Microeconomics,* Oxford University Press.
►Jogendranarayan Mitra, 2010, *Undergraduate Microeconomics,* New Central Book Agency, Kolkata.
►Karl E. Case and Ray C. Fair, 2007, *Principles of Economics*, Pearson Education Inc., 8th Edition.
► N. G. Mankiw, 2007, *Economics: Principles and Applications*, India edition by South Western, 4th Edition.
► Joseph E. Stiglitz and Carl E. Walsh, 2007, *Economics,* W.W. Norton & Company, 4th Edition.
► Samuelson and Nordhaus, *Economics,* McGraw Hill.
►Sampat Mukherjee and Debes Mukherjee, 2011, *Samakalin Arthabidya*, New Central Book Agency.
►Debasis Mazumder, 2011, *Byastigoto-O-Samastigoto Arthaniti*, ABS Publishing House.

Course Objective:

This course aims to provide a foundational understanding of economics by exploring its scope, methods, and core principles such as scarcity and efficiency. It examines the dynamics of demand and supply, including their determinants, shifts, and the role they play in determining market prices in competitive settings. Students will analyze household consumption decisions, including the impact of income and price changes, and understand

key economic concepts such as income and substitution effects. The course also introduces cost and revenue analysis, highlighting the concepts of total, marginal, and average costs, along with revenue structures in various market scenarios. Additionally, it delves into market structures like perfect competition, monopoly, and monopolistic competition, and explores distribution theories concerning land, labor, capital, and entrepreneurship. Overall, the course equips students with the analytical tools to comprehend and evaluate fundamental economic processes and structures.

Program Outcomes:

1. By the end of this course, students will have a solid foundation in economic principles and their practical applications. They will understand the importance, scope, and methods of economics, as well as the concepts of scarcity, efficiency, and the fundamental economic questions.

2. Students will gain the ability to analyze demand and supply dynamics, including factors influencing market prices and shifts in competitive markets. They will develop insights into household consumption decisions, income and substitution effects, and the relationship between income, prices, and demand.

3. Additionally, students will be proficient in evaluating cost and revenue structures, distinguishing between various market forms such as perfect competition, monopoly, and monopolistic competition. Lastly, they will comprehend theories of distribution, focusing on factors like land, labour, capital, and entrepreneurship. This course will enable students to critically analyze economic processes and apply economic reasoning to real-world issues.

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END OF SEMESTER-II (MINOR)

SYLLABUS FOR ECONOMICS MINOR OF SEMESTER-III

Course Title: Macroeconomics

Course Code: BECOMEB23T

Credit: 4

Classes: 60

1. National Income: (10)
Definition and Concepts of GNP, GDP; National Income Accounting; Unemployment, and Cost of Living; Measurement of National Income; Circular Flow of Income
2. Theory of Consumption and Investment: (15)
Consumption Function and its Determinants; APC and MPC; Life Cycle Hypothesis; Consumption under Uncertainty; Capital vs Investment; MEC; Investment Multiplier
3. Simple Keynesian Model: (10)
Effective Demand; SKM Model: Savings Investment equality; Equilibrium Income determination; Keynesian Multiplier
4. Money and Inflation: (15)
Evolution of Money; Definitions of Money and Determinants of Money Supply; Commercial and Central Bank; Money Multiplier and Central Bank's role in controlling money supply; Quantity theory of money; Inflation and its costs
5. Open Economy: (10)
Balance of Payments, exchange rates, and capital flow; Terms of Trade; Absolute and Relative Theory

Reading References:

► Dornbusch, Fischer and Startz, 2010, *Macroeconomics*, McGraw Hill, 11th edition.
► N. Gregory Mankiw, 2015, *Principles of Macroeconomics,* Indian Imprint of South Western by Cengage India, 6th edition.
► Richard T. Froyen, 2005, *Macroeconomics,* Pearson Education Asia, 2nd edition.
► Andrew B. Abel and Ben S. Bernanke, 2011, *Macroeconomics*, Pearson Education Inc., 7th edition.
► J.R.Hicks, 1960, *The Social Framework: An Introduction to Economics,* Clarendon Press, 3rd Edition.
► Sikdar Soumyen, *Principles of Macroeconomics*, Oxford University Press
►Sampat Mukherjee and Debes Mukherjee, 2011, *Samakalin Arthabidya*, New Central Book Agency.
►Debasis Mazumder, 2011, *Byastigoto-O-Samastigoto Arthaniti,* ABS Publishing House.

Course Objective:

The course aims to provide a comprehensive understanding of macroeconomic concepts and their applications. It introduces national income accounting, including definitions of GNP, GDP, and the circular flow of income, alongside the measurement of unemployment and cost of living. The course explores the theory of consumption and investment, focusing on consumption functions, determinants, and investment dynamics like the MEC and investment multiplier. Through the Simple Keynesian Model, students will understand effective demand, savings-investment equality, and equilibrium income determination. The course also examines the evolution and functions of money, the role of commercial and central banks, and the implications of inflation and money supply dynamics. Lastly, it provides insights into open economy concepts such as balance of payments, exchange rates, capital flows, and terms of trade, equipping students with the tools to analyze macroeconomic phenomena in both domestic and global contexts.

Program Outcomes:

1. By the end of this course, students will have a strong grasp of macroeconomic principles and their real-world applications. They will understand key concepts of national income, including GDP, GNP, and the circular flow of income, and learn to measure economic indicators like unemployment and the cost of living.

2. Students will gain insights into consumption and investment theories, exploring determinants, the life cycle hypothesis, and investment multipliers. They will also comprehend the Simple Keynesian Model, focusing on effective demand, savings-investment equality, and equilibrium income.

3. Additionally, students will analyze the evolution and functions of money, the role of banks, and the effects of money supply and inflation.

4. Finally, they will explore open economy topics such as balance of payments, exchange rates, capital flows, and trade theories, enabling them to critically evaluate macroeconomic issues in both national and international contexts.

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END OF SEMESTER-III (MINOR)

SYLLABUS FOR ECONOMICS MINOR OF SEMESTER-V

Course Title: Indian Economics

Course Code: BECOMEB35T

Credit: 4

Classes: 60

1. Features of Indian Economy: (10)
Features and Characteristics; Transition from Planned to the Market Economy; Planning vs NITI AYOG
2. Employment: (10)
Nature and Trends of Employment; Problems and Policy Initiatives for Poverty; MGNREGS, Human Poverty Index (HPI); Inclusive Growth; Pandemic and Migrated Labour; MDG
3. Sectoral Development: (10)
Agricultural Performance; Food Security; Industrial Revolution; Service Sector Renovation; Growth and Productivity; Performance of Monetary Sector; CBDC
4. Foreign Sector and International Relations: (10)
Trends of Trades and Investment; WTO and India; International Relations (BRICS, SAARC, SAFTA)
5. Environment and India: (10)
Policies on Climate Change and Environmental Degradation; Sustainable Development: Indian Environmental Laws
6. Globalization: (10)
Impact on Services; Formal and Informal Sectors; Foreign Aids and Foreign Investment; Policies and Performances in Agriculture and Industry

Reading References:

1. Datt and Sundaram, 2017, *Indian Economy,* S. Chand and Co., (Paperback: Gourav Datt and Ashwani Mahajan)
2. Raj Kumar Sen, 2011, *Modern Indian Economy*, Deep and Deep Publications, New Delhi
3. AN Agarwal and MK Agarwal, 2019, *Indian Economy: Problems of Development and Plannning*, New Age International Pvt. Ltd.
4. Jaydeb Sarkhel and Sk Selim, 2022, *Bharatiya Arthaniti*, Book Syndicate Private Limited
5. Debes Mukherjee, 2019, *Samakalin Bharatiya Arthaniti*, New Central Book Agency
6. RBI: *Reserve Bank of India Bulletin*, Various Issues.
7. Government of India, *Economic Survey*, Various Issues.
8. NSS: National Sample Survey Data, Various Round.

Course Objective:

This course aims to provide an in-depth understanding of the Indian economy, focusing on its features, characteristics, and transition from a planned to a market economy. It examines employment trends, poverty challenges, and policy initiatives such as MGNREGS and MDG, alongside the impact of pandemics on labor and inclusive growth. The course delves into sectoral development, analyzing agricultural performance, food security, industrial and

service sector growth, and the role of the monetary sector, including emerging trends like CBDC. It also explores India's foreign trade and international relations, emphasizing India's position in global frameworks like BRICS, SAARC, and WTO. Additionally, the course addresses environmental policies, sustainable development, and climate change initiatives in the Indian context. Finally, it evaluates the impact of globalization on services, agriculture, industry, and both formal and informal sectors, while examining foreign aid and investment policies. Through this comprehensive approach, students gain critical insights into India's economic structure, policies, and global integration.

Program Outcomes:

1. By the end of this course, students will have a thorough understanding of the key features and dynamics of the Indian economy, including its transition from a planned to a market-driven system.

2. They will be able to critically analyze employment trends, poverty challenges, and the effectiveness of policy initiatives like MGNREGS and MDG in promoting inclusive growth. Students will also gain insights into sectoral development, focusing on agriculture, food security, industrial growth, service sector innovations, and the emerging role of digital currencies like CBDC.

3. Additionally, they will comprehend India's role in international trade and relations, particularly within frameworks like BRICS and SAARC. The course will equip students with knowledge of environmental policies and sustainable development in India, as well as the impact of globalization on various sectors, foreign aid, and investment.

4. Overall, students will develop the analytical skills necessary to assess India's economic performance and its global integration.

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END OF SEMESTER-V (MINOR)

SYLLABUS FOR ECONOMICS MINOR OF SEMESTER-VII

Course Title: Development Economics

Course Code: BECOMEB47T

Credit: 4

Classes: 60

1. Economic Development: (15)
Meaning of Economic Development; Income Approach and Capability Approach; Construction and interpretation of HDI; International variations in development measures; Comparing development trajectories across nations and within them; Dependency School of Development.
2. Economic Growth: (15)
Concept and Meaning; Growth Models: Harrod-Domar, Solow; Sources of economic growth; International Comparisons.
3. Poverty and Inequality: (15)
Inequality Axioms; Comparison of commonly used inequality measures; Gender Inequality; Connections between inequality and development; Poverty measurement, HPI; Poverty traps and path Dependence of growth processes.
4. Political Institutions and the State: (15)
Definition of institutions; Evolution of Political and Economic Institutions; The determinants of democracy; alternative institutional trajectories and their relationship with economic performance; within-country differences in the functioning of State Institutions; State ownership and regulation; Government failures and Corruption.

Reading References:

► Debraj Ray, 2009, *Development Economics,* Oxford University Press.
► Partha Dasgupta, 2007, *Economics: A Very Short Introduction,* Oxford University Press.
► Abhijit Banerjee, Roland Benabou and Dilip Mookerjee, 2006, *Understanding Poverty,* Oxford University Press.
► Kaushik Basu, 2007, *The Oxford Companion to Economics in India,* OUP.
► Amartya Sen, 2000, *Development as Freedom,* OUP.
► Daron Acemoglu and James Robinson, 2006, *Economic Origins of Dictatorship and Democracy,* Cambridge University Press.
► Meier and Rauch, *Leading Issues in Development Economics,* OUP.
► Todaro and Smith, 2009, *Economic Development,* Pearson Education.
►Zahirul Islam Sikdar, 2010, *Arthanoitik Unnayan O Parikalpana,* Confidence Prakashani, Dhaka.

Course Objective:

The course aims to provide a comprehensive understanding of economic development and growth, exploring different approaches to development such as the income and capability approaches, and examining international variations in development measures like HDI. It also

covers the comparison of development trajectories across nations and within them, and introduces the Dependency School of Development. Students will learn about economic growth concepts and growth models, including Harrod-Domar and Solow, and explore the sources of economic growth through international comparisons. The course also examines poverty and inequality, focusing on inequality measures, gender inequality, and the links between inequality and development, as well as poverty measurement and poverty traps. Finally, it delves into the role of political institutions and the state in economic development, covering the evolution of political and economic institutions, democracy determinants, state ownership, regulation, government failures, and corruption, providing students with a holistic view of how institutions influence economic outcomes.

Program Outcomes:

1. By the end of this course, students will have a solid understanding of economic development and growth, with the ability to analyze and compare development measures such as HDI across nations and interpret various approaches to development, including the income and capability approaches.

2. They will be able to evaluate economic growth models like Harrod-Domar and Solow, identify sources of growth, and make international comparisons. Students will gain insights into poverty and inequality, including measures of inequality, gender disparities, and the relationship between inequality and development, as well as understanding poverty traps.

3. Additionally, they will develop a deep understanding of the role of political institutions and the state in shaping economic performance, evaluating the evolution of political and economic institutions, the determinants of democracy, state ownership, regulation, and the implications of government failures and corruption.

4. This course will equip students with the analytical tools to assess the complex relationship between economic development, growth, inequality, and institutional factors.

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END OF SEMESTER-VII (MINOR)

SYLLABUS FOR ECONOMICS SKILL ENHANCEMENT COURSE (SEC)
SEMESTER-I,II & III

Course Title: Data Analysis

Course Code: BECOSEC01/02/03T

Credit: 3

Classes: 45

a. Unit 1: Data Collection: (15)
Definitions and Types of Data; Sources of Data; Population Census versus Sample Surveys; Questionnaire; Sources of Indian Data (Economic Survey, RBI Bulletin on Currency and Finance, ASI Data, Foreign Trade Statistics, NSS Consumer Surveys)
b. Unit 2: Data Presentation: (15)
Tabulation from Raw Data; Frequency Distribution and summary Statistics; Graphical Presentation (Line, Bar, Pie, Histogram, Ogive, Pictograph)
c. Unit 3: Data Analysis: (15)
Central Tendency; Dispersion; Moments; Analysis using MS Office (Word, Excel, Power point)

Reading References:

► P.H. Karmel and M. Polasek, 1978, *Applied Statistics for Economists*, 4th edition, Pitman.
► M.R. Spiegel, 2003, *Theory and Problems of Probability and Statistics*, Schaum Series.
►Goon, A. M., Gupta, M. K., & Dasgupta, B., 1985, *Fundamentals of Statistics (Volume I)*, The World Press Private Ltd.
►R.V. Hogg and A.T. Craig, *An Introduction to Mathematical Statistics*, Third Edition, Amerind, New York, London
► Official websites of RBI, Government of India, NSS, ASI.

Course Objective:

The course aims to provide students with a thorough understanding of data collection, presentation, and analysis techniques. It covers the definitions and types of data, distinguishing between population census and sample surveys, and explores various sources of data, including those specific to India such as the Economic Survey, RBI Bulletin, and NSS Consumer Surveys. The course also focuses on data presentation, teaching students how to tabulate raw data, create frequency distributions, and present data graphically using methods like line, bar, pie, histogram, ogive, and pictographs. Additionally, students will learn how to analyze data using measures of central tendency, dispersion, and moments, while also gaining practical skills in data analysis using MS Office tools, including Word, Excel, and PowerPoint. Through these objectives, the course equips students with the necessary tools to effectively collect, present, and analyze data for various applications.

Program Outcomes:

1. By the end of this course, students will have a strong foundation in data collection, presentation, and analysis. They will be able to distinguish between different types of

data and data sources, including national and Indian-specific data like the Economic Survey and NSS Consumer Surveys.

2. Students will gain skills in organizing and presenting data, creating frequency distributions, and using various graphical methods such as line, bar, pie charts, histograms, ogives, and pictographs.

3. They will also learn to analyze data using measures of central tendency, dispersion, and moments, and apply these concepts using MS Office tools such as Word, Excel, and PowerPoint.

4. Overall, students will be equipped to effectively collect, present, and analyze data for various research and analytical purposes.

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END OF SEMESTER-I,II & III (SEC)

SYLLABUS FOR ECONOMICS FOR MULTIDISCIPLINARY COURSE (MDC)

SEMESTER: III (TO BE OPTED BY STUDENTS WHO DID NOT HAVE ECONOMICS IN THEIR (10+2) LEVEL)

Course Title: Political Economy and Development

Course Code: BMDCECO03T

Credit: 3

Classes: 45

1. **Introduction:** Evolution of Political Economy; Meaning and Scope of Political Economy (2)
2. **Trade and Development:** Trade as Engine of Growth; Import Substitution vs. Export Promotion; Terms of Trade Debate (8)
3. **Underdevelopment and Dependence:** Concepts; Dependency Theory; Policy Measures; MDCs, FDI, FII; NIEO (10)
4. **Planning and Market Mechanism:** Nature and Transition; Plan Failure; Resurgent Preference for Market over Planning (10)
5. **Institutions:** Structure and Functions of IMF; Evolution of SAP; Functions of World Bank; UNCTAD; WTO (10)
6. **Capitalism:** Transition from Mercantilism to Capitalism; Rise of Market Economy; Role of State; Impact of Transition on Third World Countries (5)

Reading References:

1. Debes Mukherjee, 2003, *Development Policies, Problems and Institutions*, New Central Book Agency, Kolkata
2. Deepak Nayyar, 1997, *Trade and Industrialization*, Oxford University Press
3. Wilber and Jameson, 1992, *The Political Economy of Development and Underdevelopment*, McGraw Hill International
4. Pranab Bardhan and JE Roemer, 1993, *Market Socialism: The Current Debate*, Oxford University Press
5. Hasibur Rahaman and Sadiya Aafrin, 2022, *Rajnoitik Arthoniti*, Pranta Prokashon, Dhaka
6. S. Pan, 2017, *Classical Political Economy*, Kundu Press, West Bengal
7. Todaro and Smith, 2009, *Economic Development*, Pearson Education.
8. Zahirul Islam Sikdar, 2010, *Arthanoitik Unnayan O Parikalpana*, Confidence Prakashani, Dhaka.

Course Objective:

The course aims to provide a comprehensive understanding of political economy by exploring its evolution, scope, and key concepts. It delves into the role of trade in development, comparing strategies like import substitution and export promotion, and analyzing terms of trade debates. The course examines underdevelopment and dependence, including dependency theory, policy measures, and the role of MDCs, FDI, FII, and initiatives like NIEO.

It further explores the dynamics between planning and market mechanisms, addressing the transition, failures of planning, and the resurgence of market preferences. The role and structure of global institutions such as the IMF, World Bank, UNCTAD, and WTO are analyzed, along with the evolution of Structural Adjustment Programs (SAP).

Finally, the course traces the transition from mercantilism to capitalism, the rise of the market economy, the role of the state, and the impact of these transitions on Third World countries, fostering a critical understanding of political economy's historical and contemporary dimensions.

Program Outcomes:

1. By the end of the course, students will have a thorough understanding of the evolution and scope of political economy, enabling them to analyze its core concepts and frameworks. They will critically assess the role of trade as a driver of economic growth and evaluate strategies like import substitution and export promotion.

2. The course will deepen their understanding of underdevelopment and dependency, focusing on dependency theory, the influence of global economic factors such as FDI, FII, and MDCs, and initiatives like NIEO. Students will also examine the dynamics of planning and market mechanisms, including their transitions, successes, and failures.

3. Furthermore, they will gain insights into the structure and functions of key international institutions, including the IMF, World Bank, UNCTAD, and WTO, and understand their impact on global economic systems. Lastly, the course will explore the historical transition from mercantilism to capitalism, the rise of the market economy, the role of the state, and the implications of these transitions for Third World countries.

4. By the end of the course, students will have developed critical analytical skills to evaluate political and economic systems in both historical and contemporary contexts.

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END OF SEMESTER-III (MDC SYLLABUS)