

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO101	Mathematical Methods for Economics - I	Core	4	0	0	4

**Course Description:** The aim of this course is to transmit the fundamentals of mathematics that will enable the students to apply numerous mathematical methods to solve various economic problems.

**Course Objectives:**

- To introduce students to differential calculus.
- To introduce the basics of linear algebra, by building on foundations of matrix algebra.
- To enable the students to understand the concept of Comparative-Static Analysis.

**Course Outcomes:**

- Apply differential calculus in solving economic problems.
- Use Matrix algebra in economic applications.
- Gain working knowledge on the concept of Comparative-Static Analysis.

**UNIT –I**

**Basic Concepts:** Mathematical Versus Nonmathematical Economics—Ingredients of a Mathematical Model—The Real-Number System- The Concept of Sets- Relations and Functions- Types of Function- Equilibrium Analysis in Economics.

**UNIT—II**

**Linear Models and Matrix Algebra:** Matrices and Vectors-Matrix Operations— Commutative, Associative and Distributive Laws— Identity and Null Matrices— Transposes and Inverses, Conditions of Nonsingularity of Matrix — Test of Nonsingularity using Determinants, Basic Properties of Determinants— Matrix Inversion - Cramer’s Rule.

**UNIT III**

**Comparative-Static Analysis:** The Nature of Comparative Statics—Rate of Change and the Derivative- The Concept of Limits - Digression on Inequalities and Absolute Values- Limit Theorems.

## UNIT IV

**Rules of Differentiation:** Rules of Differentiation for a Function of One Variable- Rules of Differentiation involving Two or More Functions of the Same Variable- Rules of Differentiation involving Functions of Different Variables-Partial Differentiation- Applications to Comparative-Static Analysis.

### Readings

Textbooks:

- Chiang, A.C. and K. Wainwright (2013), Fundamental Methods for Mathematical Economics, McGraw Hill, New Delhi.
- Carl P Simon Lawrence Blume, Mathematics for Economists, Viva Books
- Allen, R.G.D (2008), Mathematical Analysis for Economists, Macmillan Press, London.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO201	Introduction to Statistics	Core	4	0	0	4

**Course Description:** The purpose of this course is to introduce statistics to those who are studying economics. It provides students with a concise introduction to sampling and statistics with practical applications. Basic concepts and terminology that are fundamental to statistical analysis and inference are explained in this course.

**Course Objectives:**

- To introduce and familiarize the students with descriptive and inferential statistics.
- To understand the methods of sampling and collecting data with practical applications.
- To equip students with methods for analyzing and interpreting data.
- Make the students ready to solve different problems using statistical operations.

**Course Learning Outcomes:**

- Understand the concept of random variables and discrete and continuous distributions of random variables.
- Skilled in utilizing statistical techniques for quantitative, data-based problems, analysis, and inference.
- Learn about hypothesis testing, the types of errors, and the power of a test.
- Use time series data to estimate and interpret statistical trends.
- Understanding the concept of calculating inflation, WPI, and the CPI is something I will be able to do.

**UNIT –I**

**Inferential Statistics:** Nature and Classification of Data: Univariate, Bivariate and Multivariate Data—Types of Data—Introduction to Sampling—Types of Sampling; (i) Simple Random Sampling (ii) Stratified Random Sampling (iii) Systematic Sampling (iv) Multi-Stage and Multi-Phase Sampling (v) Cluster Sampling (vi) Area Sampling (vii) Quota Sampling (viii) Snowball Sampling.

## UNIT—II

**Design of Sample and Testing of Hypothesis:** Parameters; Statistics - Sampling and Non-Sampling Errors— Advantages and Disadvantages of Sampling—Definition of Sampling Distribution—Standard Error—Hypothesis (Null and Alternative) —Level of Significance—P Value—Type I and Type II Errors, Tests of Hypothesis (Z, t, F and  $\chi^2$ ).

## UNIT III

**Index Numbers:** Introduction: Problems involved in the construction of Index Numbers—Simple Aggregate Method and Weighed Methods (Laspeyres's, Paasche's and Fisher's Index Number); Types of Index Numbers; Fisher Ideal Index Number; The Criteria of Good Index Number; Base Shifting, Splicing and Deflating of Index Numbers.

## UNIT IV

**Time Series Analysis:** Introduction; Components of Time Series; Determination and Elimination of Trend; Linear and Non – Linear (i) Second Degree Parabola and Exponential Curves; Measurement of Seasonality; Cyclical and Random Components; Models for Time Series; Forecasting Methods.

## UNIT V

**Interpolation and Extrapolation:** Introduction; Assumptions; Definitions; Methods – (i) Graphical (ii) Algebraic Methods –Interpolation and Extrapolation Methods - Simple Examples.

### Readings

Textbooks:

- S.P. Gupta “Statistical Methods”, Sultan Chand and Sons, Educational Publishers, New Delhi, 46<sup>th</sup> Revised Edition, 2021.
- D.R. Agarwal “Elementary Mathematics and Statistics for Economists”, Vrinda Publications
- (P), New Delhi, Reprint: 2002.

Reference Book:

- A.N. ARORA, P.N. ARORA and Sumeet ARORA “Comprehensive Statistical Methods”, Sultan Chand and Co. Second Edition.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO202	Introductory Microeconomics	Core	4	0	0	4

**Course Description:** This is an introductory undergraduate course on the fundamentals of microeconomics, and it provides foundation for economic analysis and thinking for many years of study in economics, business, or related fields. Students are familiarised with theoretical concepts such as supply and demand, consumer and producer behaviour, and market structures.

**Course Objectives:**

- To understand the scope and importance of microeconomics.
- To understand consumer and producer behavior and relevance to real-life.
- To understand the market system and types of competition.

**Course Learning Outcomes:**

- Gain a foundational understanding of economic principles relevant to microeconomics.
- Analysis of the economic behavior of both consumers and producers.
- Application of economic theories and formulation of views on the demand and supply in the market and types of competition.

**UNIT I**

**Introduction:** Nature and scope of microeconomics, basics of supply and demand

**UNIT II**

**Consumer Behavior:** Consumer preferences, budget constraints, consumer choices, marginal utility, income and substitution effects, consumer surplus, empirical estimation of demand

**UNIT III**

**Producer Behavior:** Firms and their production decisions, production function with one variable input, production function with two variable inputs, costs in the short run and the long run, concept of revenue

**UNIT IV**

**Market Structure:** Types of markets, price determination under various types of markets, competitive firms and features, monopoly, and features

**Readings:**

- H R. Varian. 2010. Intermediate Microeconomics, a Modern Approach, Springer (India) Pvt. Ltd. India, 2010
- R S. Pindyck and D.L. Rubinfeld, (2000), Microeconomics, 3rd edition, Prentice Hall, India

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO203	Introductory Macroeconomics	Core	4	0	0	4

**Course Description:** The course introduces macroeconomics to undergraduate students of economics. It aims to impart understanding of national income, classical economics and Keynesian economics.

### Course Objectives

- To understand concepts of macroeconomics with practical applications.
- To understand classical system and Keynesian economics.
- To understand national income accounting and methods of its measurement.
- To understand the functioning of closed economy in the short run.

### Course Learning Outcomes

- Gain a foundational understanding of macroeconomics.
- Understand the income, consumption, and savings.
- Apply macroeconomics fundamentals to real-world economic situations.
- Enhance interdisciplinary thinking by exploring the dynamic interplay between macroeconomics and policy making.

## UNIT I

**The Classical System:** Basic ideas of Classical Macroeconomics, Say 's Law and Quantity Theory of Money, Loanable Fund Theory, Classical Theory of Income & Employment Determination, Full Employment and Wage-Price Flexibility, Classical Dichotomy and Neutrality of Money

## UNIT II

**National Income Accounting:** Basic concepts of National Income Accounting, The Circular Flow, GNP, GDP, NNP, and NDP at market price and at factor cost, Measurement of National Income - Value Added Method and Expenditure Method, Problem of Double Counting, Role of Government, Concepts of Corporate Income, Corporate Savings, Personal Income, Personal Disposable Income, Personal Savings

### **UNIT III**

**Simple Keynesian Model in a Closed Economy:** Keynesian Consumption Function, Keynesian Saving Function, Income Determination in Simple Keynesian Model, Stability of Equilibrium, Effective Demand and Demand Determined Output, Keynesian Model with Government Expenditure and Tax, Expenditure, Tax Rate and Balanced Budget Multiplier

### **UNIT IV**

**Closed Economy in the Short Run:** IS-LM model, Fiscal and Monetary Multipliers, Efficiency in Fiscal Policy and Monetary Policy, Equilibrium, Stability, and Comparative Statics, Effects of fiscal and monetary policies

**Readings:**

- Froyen, R. T. (2005). Macroeconomics, 2<sup>nd</sup> ed. Pearson Education Asia.
- Mankiw, N. G. (2016). Macroeconomics, 9<sup>th</sup> ed. Worth Publishers
- Blanchard, O. (2018). Macroeconomics, 7<sup>th</sup> ed. Pearson Education.
- Dornbusch, R., Fischer, S., Startz, R. (2018). Macroeconomics, 12<sup>th</sup> ed. McGraw-Hill.



Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO204	Mathematical Methods for Economics - II	Core	4	0	0	4

**Course Description:** The aim of this course is to transmit the fundamentals of mathematics that will enable the students to apply numerous mathematical methods to solve various economic problems. The working knowledge of basic static optimization facilitates decision making for managers and business owners alike.

**Course Objective:**

- To introduce students to integral calculus and differential equations.
- To introduce the basics of linear algebra, by building on foundations of matrix algebra.
- To enable the students to apply unconstrained and constrained optimization.

**Course Outcomes:**

- Apply integration and differential equations in solving economic problems.
- Use linear algebra in economic applications.
- Gain working knowledge of basic static optimization.

**UNIT I**

**Integration:** Concept, Rules of Integration — Methods of Integration, Integration by Parts— Definite and Indefinite Integrals— Improper integrals — Fundamental Theorem of calculus — Illustrated examples, Computation techniques.

**UNIT II**

**Differential Equations:** Concept of Differential Equation— Exact Differential Equation Integrating Factor - First Order Linear Differential Equation — Economic Applications of First Order DE—Second Order Differential Equation - Economic Applications of Second Order DE-Illustrative examples and exercise.

**UNIT III**

**Linear Algebra:** Vector Spaces — Linear Transformations — Systems of Linear Equations — Determinants: Characterization, Properties, And Applications.

**UNIT IV**

**Optimization:** Concept of maxima and minima— Global & Local optima, identification of maxima and minima—points of inflection-illustrative examples—Unconstrained and Constrained maximization- Lagrange Method. Illustrative examples.

**Readings:**

Textbooks:

- Chiang, A.C. and K. Wainwright (2013), Fundamental Methods for Mathematical Economics, McGraw Hill, New Delhi.
- Carl P Simon Lawrence Blume, Mathematics for Economists, Viva Books
- Allen, R.G.D (2008), Mathematical Analysis for Economists, Macmillan Press, London.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO205	Intermediate Microeconomics	Core	4	0	0	4

**Course Description:** The course is designed to provide sound training in microeconomic theory to formally analyse the behaviour of individual agents. Since students are already familiar with the quantitative techniques in the previous semesters, mathematical tools are used to facilitate understanding of the basic concepts. This course looks at the behaviour of the consumer and the producer and covers the behaviour of a firm under different types of markets.

### Course Objectives

- To make students familiar with advanced concepts of Intermediate Microeconomics.
- To provide an understanding of consumer, producer, and cost theories at the intermediate level using mathematical techniques.
- To provide an understanding of Perfect and Imperfect Markets and the Efficiency of Markets.
- To analyse market structures and apply theoretical concepts of perfect competition to identify the behaviour of monopolies and imperfect competition.

### Course Learning Outcomes

- Gain a foundational understanding of consumer theory and production theory and the functioning of market structures.
- Understanding of behaviour of the consumer and the producer and covering the behaviour of a firm under different types of markets.
- Apply Mathematical techniques to facilitate understanding of consumer and producer equilibrium.
- Understanding of factor demand and factor price determination in various market forms.
- Understanding of General equilibrium, Pure exchange, and Pareto optimality

## UNIT I

**Consumer Theory:** Axioms of Preference, utility function, Cardinal, and ordinal Theory; budget constraint; Convexity, Marshallian demand; Hicksian Demand, Income effect, Substitution effect, Slutsky equation; Elasticity, Elasticity of substitution, revealed preference.

## UNIT II

**Production, Costs and Market Structure:** Technology; isoquants; production with one and more variable inputs; returns to scale; short run and long run costs; cost curves in the short run and long run; review of perfect competition. Monopoly; pricing with market power; price discrimination and oligopoly-Cournot and Stackelberg Equilibrium Applications; monopolistic competition.

## UNIT III

**Factor Market:** Basic concepts- derived demand, productivity of an input, marginal product of an input, marginal revenue product, Marginal productivity theory of distribution, Labour demand and supply of labour in different market structure, Land markets and rent determination.

## UNIT IV

**General Equilibrium:** Pure Exchange, Pareto Optimality, Productive and Allocative Efficiency, Welfare Theorems, General Equilibrium with and without and production, Imperfect Competition.

### Readings:

- Hal R. Varian, Intermediate Microeconomics, a Modern Approach, 8th edition, W.W. Norton and Company/Affiliated East-West Press (India), 2010. The workbook by Varian and Bergstrom could be used for problems.
- C. Snyder and W. Nicholson, Fundamentals of Microeconomics, Cengage Learning (India), 2010.
- B. D. Bernheim and M. D. Whinston, Microeconomics, Tata McGraw-Hill (India), 2009.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO206	Intermediate Macroeconomics	Core	4	0	0	4

**Course Description:** The course aims to train senior undergraduate students in Macroeconomics. The course delves into aggregate economy, inflation & unemployment, and open economy models.

### Course Objectives

- To understand concepts of macroeconomics with practical applications.
- To understand aggregate demand and aggregate supply.
- To understand inflation, unemployment, and the role of expectations.
- To understand the functioning of an open economy.

### Course Learning Outcomes

- Gain a foundational understanding of macroeconomics.
- Understand economic growth, inflation, and unemployment.
- Apply macroeconomics fundamentals to real-world economic situations.
- Enhance interdisciplinary thinking by exploring the dynamic interplay between macroeconomics and policy making.

### UNIT I

**Consumption Theories:** Keynesian Consumption Function, Fisher's Theory of Optimal Intertemporal Choice, Modigliani's Life Cycle Hypothesis, Friedman's Permanent Income Hypothesis, Dusenberry's Relative income Hypothesis

### UNIT II

**Aggregate Demand and Aggregate Supply:** Revisiting IS LM Framework, Classical to Neoclassical Monetary Theory, Derivation of Aggregate Demand Curve, Derivation of Aggregate Supply Curve, Interaction of Aggregate Demand and Aggregate Supply Curves

### UNIT III

**Inflation, Unemployment and Expectations:** Phillips Curve, Rational and Adaptive Expectations, Policy Ineffectiveness Debate, Concept of Inflationary Gap, Demand Pull vs Cost Push Inflation, Mark up inflation, Stagflation, Rational Expectation and Random Walk of Consumption Expend

### UNIT IV

**Open Economy Models:** Short Run Open Economy Models, Mundell Fleming Model, Exchange Rate Determination, Purchasing Power Parity, Asset Market Approach, Dornbusch's Overshooting Model, Monetary Approach to Balance of Payments, International Financial Market

**Readings**

- Dornbusch, Fischer and Startz, *Macroeconomics*, McGraw Hill, 11th edition, 2010.
- N. Gregory Mankiw. *Macroeconomics*, Worth Publishers, 7th edition, 2010.
- Olivier Blanchard, *Macroeconomics*, Pearson Education, Inc., 5th edition, 2009.
- Steven M. Sheffrin, *Rational Expectations*, Cambridge University Press, 2nd edition, 1996.
- Andrew B. Abel and Ben S. Bernanke, *Macroeconomics*, Pearson Education, Inc., 7th edition, 2011.
- Errol D'Souza, *Macroeconomics*, Pearson Education, 2009.
- Paul R. Krugman, Maurice Obstfeld and Marc Melitz, *International Economics*, Pearson Education Asia, 9th edition, 2012.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO207	Public Economics and Policies	Core	4	0	0	4

**Course Description:** This course provides a basis for the economic analysis of public policy issues from the points of view of economic efficiency and equity. It analyses the role of the public sector in the economic system, its functions, management techniques, taxation, public goods provision, methods of efficiency evaluation, and fiscal federalism. The focus of the course is on the main parts of public finance — taxation and government expenditures. Issues related to the role of the state, public choice, and management of public assets and liabilities are also examined. The prerequisites of the course are intermediate microeconomics, macroeconomics, and economic policy theory.

**Course Objectives:**

- To introduce the basics of Public Economics and Policies
- To provide students with an understanding of the scope of public economics i.e., the study of public provision, public finance - expenditure and taxation - and public choice
- To enhance the ability to analyse and understand key issues like how problems of externalities should be identified and addressed.

**Course Learning Outcomes:**

- Understand the basics of Public Economics and Policies
- Demonstrate their understanding of the main theoretical and empirical concepts in public economics, analytical grasp of implications of government intervention for allocation, distribution, and stabilization, and the main issues in government revenues and expenditure.
- To demonstrate their understanding of public economics and models that compare the economic welfare effects of various environmental policy options, demonstrate their understanding of the usefulness and problems related to taxation and government expenditure, and demonstrate their critical understanding of public policies.

**Unit I**

**Public Economic Theory:** Fiscal functions: an overview; Public Goods: definition, models of efficient allocation, pure and impure public goods, free riding.

## **Unit II**

**Externalities:** The problem and its solutions, taxes versus regulation, property rights, the Coase theorem.

## **Unit III**

**Taxation:** Its economic effects; deadweight loss and distortion, efficiency and equity considerations, tax incidence, optimal taxation.

## **Unit IV**

**Indian Public Finances:** Tax System: structure and reforms; Budget, deficits and public debt; Fiscal federalism in India.

### **Readings:**

- Hindriks, J., Myles, G. (2013). Intermediate public economics, 2nd ed. MIT Press.
- Cullis, J., Jones, P. (1998). Public finance and public choice, 2nd ed. Oxford University Press
- Stiglitz, J. (2009). Economics of the public sector, 3rd ed. W. W. Norton.
- Jonathan Gruber Public Finance and Public Policy, 5<sup>th</sup> Edition, Worth Publishers, A Macmillan Education Imprint, New York
- Rao, M. (2005). Changing contours of federal fiscal arrangements in India. In A. Bagchi (ed.): Readings in public finance. Oxford University Press.
- Rao, M., Kumar, S. (2017). Envisioning tax policy for accelerated development in India. Working Paper No. 190, National Institute of Public Finance and Policy.
- Reddy, Y. (2015). Fourteenth finance commission: Continuity, change and way forward. Economic and Political Weekly, 50(21), 27-36.



Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO208	Growth and Development	Core	4	0	0	4

**Course description:** This course focuses on economic development. The course commences with a discussion of different concepts of development and their justification. Then comes the aggregation of growth models and cross-national comparisons of the growth experience to aid in evaluation of these models. The course ends by linking political institutions to growth and inequality by discussing the role of the state in economic development and the information and incentive problems that affect state governance.

### Course Objectives

- The student will be able to understand the concept of growth and development.
- To assist students in comprehending the theories and strategies of growth and development.
- Evaluate how economic reasoning can be applied to study relevant problems and policies in economics.
- This course exposes students to some of the key ideas and concepts in the areas of economic growth and human development.

### Course Outcome

- Understand the basic theories and models of development economics.
- Understand the basic demographic concepts and their evolution during the process of development.
- Understand the causes and measures of poverty, inequalities, and unemployment.
- Understand the relationship between political institutions and economic performance.
- Understand the role of globalization and increased international dependence in the process of development.

### Unit I

**Conceptions of Development:** Alternative measures of development, documenting the international variations in these measures, comparing development trajectories across nations and within them.

### Unit II

**Theories of Economic Development:** Adam Smith, Ricardo, Marx, Schumpeter, Rostow, Balanced & Unbalanced Growth, Big Push Approach.

### **Unit III**

**Growth Models and Empirics:** The Harrod-Domar model, the Solow model and its variants, endogenous growth models, and evidence on the determinants of growth

### **Unit IV**

**Poverty and Inequality: Definitions, Measures and Mechanisms:** Inequality axioms; a comparison of commonly used inequality measures; connections between inequality and development; poverty measurement; characteristics of the poor; mechanisms that generate poverty traps and path dependence of growth processes.

### **Unit V**

**Political Institutions and the Functioning of the State:** 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

#### **Readings:**

##### Textbooks

- Debraj Ray, *Development Economics*, Oxford University Press, 2009.
- Michael Todaro and Stephen Smith, *Economic Development*, Pearson

##### References

- Partha Dasgupta, *Economics, A Very Short Introduction*, Oxford University Press, 2007.
- Abhijit Banerjee, Roland Benabou and Dilip Mookerjee, *Understanding Poverty*, Oxford University Press, 2006.
- Amartya Sen, *Development as Freedom*, OUP, 2000.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO301	Introductory Econometrics	Core	4	0	0	4

**Course Description:** This course is designed to introduce students to the basic principles of econometrics, which may be further developed to pursue advanced topics or employment purposes. Students develop the statistical and economic intuition behind the concept of regression, extension to multivariable case and the consequences of relaxing the standard OLS assumptions. Additionally, they are briefly introduced to dummy variable regression.

**Course Objectives:**

- To understand the scope of and the need for econometrics.
- To understand the basics of regression and intuitive meaning of the parameters.
- To test and infer the regression parameters.
- To study the various forms of biases arising due to relaxing the OLS assumptions.

**Course Learning Outcomes:**

- Gain a foundational understanding of economic principles relevant to econometrics.
- Analysis of the statistical, economic, and intuitive meaning of regression and the outcomes of it.
- To consider the consequences of bias in a model and remedy it.
- To choose between various models based on the appropriate factors.

**UNIT I**

**Simple Linear Regression model:** Nature and scope of econometrics, two variable case of OLS estimation, goodness of fit, testing of hypotheses, scaling and units of measurement, confidence intervals, Gauss-Markov theorem, forecasting and prediction

**UNIT II**

**Multiple Linear Regression Model:** Extension to a multivariate setting, introduction of non-linearities through functions of explanatory variables

**UNIT III**

**Violations of Classical Assumptions:** Consequences, detection, and remedies of multicollinearity, Consequences, detection, and remedies of serial correlation, Consequences, detection, and remedies of heteroscedasticity, Specification Bias

**UNIT IV**

**Discrete Choice Models:** Uses of dummy variables in regression, Linear Probability model, Logit and Logistic Regression, Probit Model

**Readings:**

- Dougherty.C, Introduction to Econometrics, 4<sup>th</sup> ed. Oxford University Press.
- Damodar Gujarati (2014), Econometrics by Example, 2<sup>nd</sup> ed. Palgrave Macmillan.
- Gujarati,D. Porter,D. (2010), Essentials of Econometrics, 4<sup>th</sup> ed. MacGrawHill
- Woolridge,J. (2014). Introduction to Econometrics: A modern approach, 5<sup>th</sup> ed. Cengage Learning.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO302	Financial Economics	Core	4	0	0	4

**Course Description:** This course introduces students to the economics of finance. Some of the basic models used to benchmark valuation of assets and derivatives are studied in detail. These include the CAPM, and the Binomial Option Pricing models. The course ends with a brief introduction to corporate finance.

**Course Objectives:**

- To introduce to the basics of financial economics
- To understand to the behaviour of investors under different market conditions.
- To understand the basics of money and capital markets.

**Course Outcomes:**

- Understand the basics of financial economics
- Understand the behaviour of investors under different market conditions.
- Understand the basics of money and capital markets

**UNIT I**

**Investment theory and portfolio analysis: detarministic cash flow streams:** Basic theory of interest; discounting and present value; internal rate of return; evaluation criteria; fixed-income securities; bond prices and yields; interest rate sensitivity and duration; immunization; the term structure of interest rates; yield curves; spot rates and forward rates.

**UNIT II**

**Single period random cash flows:** Random asset returns; portfolios of assets; portfolio mean and variance; feasible combinations of mean and variance; mean-variance portfolio analysis: The Markowitz model and the two-fund theorem; risk-free assets and the one-fund theorem.

**UNIT III**

**Capital asset pricing model:** The capital market line; the capital asset pricing model; the beta of an asset and of a portfolio; security market line; use of the CAPM model in investment analysis and as a pricing formula.

## UNIT IV

**Options and derivatives:** Introduction to derivatives and options; forward and futures contracts; options; other derivatives; forward and future prices; stock index futures; interest rate futures; the use of futures for hedging; duration-based hedging strategies; option markets; call and put options.

### Readings:

#### Textbooks

- David G. Luenberger, Investment Science, Oxford University Press, USA, 1997.
- Hull, John C., Options, Futures and Other Derivatives, Pearson Education, 6th edition, 2005.
- Thomas E. Copeland, J. Fred Weston and Kuldeep Shastri, Financial Theory and Corporate Policy, Prentice Hall, 4th edition, 2003.
- Further Readings
- Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance, McGraw-Hill, 7th edition, 2002.
- Stephen A. Ross, Randolph W. Westerfield and Bradford D. Jordan, Fundamentals of Corporate Finance. McGraw-Hill, 7th edition, 2005.
- Burton G. Malkiel, A Random Walk Down Wall Street, W.W. Norton & Company, 2003.
- William Sharpe, Gordon Alexander and Jeffery Bailey, Investments, Prentice Hall of India, 6th edition, 2003.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO303	Indian Economy	Core	4	0	0	4

**Course Description:** This course introduces students to the process of India's development from the initial days of planning after independence to the reforms and thereafter. Using appropriate analytical frameworks, this course reviews major trends in India's economic indicators and policy debates in the post-Independence period, with emphasis on paradigm shifts and turning points. Given the rapid changes taking place in India, the reading list will have to be updated annually.

**Course Objectives:**

- The aim of this course is to analyse significant changes in economic indicators and policy debates in India during the post-Independence period using appropriate analytical frameworks, with an emphasis on paradigm shifts and turning points.
- The reading list will need to be updated annually due to the rapid changes happening in India.

**Course Outcomes:**

- Acknowledge the primary concerns associated with the Indian Economy.
- Gain an understanding of major policy debates, particularly in the Indian context.
- Understand the difference between growth and development and the factors that influence development.
- Understand the emerging issues of Indian Economy.
- Understand sector-specific policies and their impact on shaping trends in key economic indicators in India.

**UNIT I**

**Performance of Indian Economy Since 1947:** Growth and Structural Changes—Features/Characteristics of Indian Economy—Human Development Index Traditional Methodology and New Methodology—Sustainable Development—Capital Formation—Demographic Transition—Reforms in Indian Economy

**UNIT II**

**Key Issues of Indian Economy:** Issues and Trends of Unemployment—Poverty in India--Problem of Inequality—Issues of Education—Gender Issues in India

### UNIT III

**Structural Performance of Agrarian Economy:** Importance and Features of Indian Agricultural—Trends in Performance and Productivity—Agricultural Markets and Institutions Credit—Land Reforms—Green Revolution in Indian Agriculture-- Agricultural Labour—Food Security—Public Distribution System.

### UNIT IV

**Structural Performance of Industrial Sector in India:** Trends, Productivity and Growth of Industries—Industrial Policy in India—Industrial Sickness—Small Scale Industries—Foreign Direct Investment in India.

### UNIT V

**Government Policies and Regional Institutions:** Trends and Performance in Services—GATT—WTO—IMF—Indian Foreign Trade—Monetary Policy—Fiscal Policy

**Readings:**

Textbooks:

- Puri, V.K. & Mishra S.K, 2019- Indian Economy. Himalaya Publishing House, New Delhi 2019.
- Gaurav Datt and Ashwani Mahajan, 2019- Indian Economy. S Chand and Company Limited, New Delhi 2019.
- Uma Kapila 2019. *Indian Economy since independence: A Comprehensive and Critical Analysis of Indian Economy 1947-2019*. Academic Foundation, New Delhi 2019

Further Readings:

- Jean Dreze and Amartya Sen, 2013. *An Uncertain Glory: India and its Contradictions*, Princeton University Press.
- Himanshu, 2010, Towards New Poverty Lines for India, *Economic and Political Weekly*, January.
- Jean Dreze and Angus Deaton, 2009, Food and Nutrition in India: Facts and Interpretations, *Economic and Political Weekly*, February.
- Kaushik Basu, 2009, —China and India: Idiosyncratic Paths to High Growth, *Economic and Political Weekly*, September.
- Reetika Khera, 2011, —India's Public Distribution System: zUtilization and Impact, *Journal of Development Studies*.



- Gaurav Datt and Ashwani Mahajan, 2019- *Indian Economy*. S Chand and Company Limited, New Delhi 2019.
- Puri, V.K. & Mishra S.K, 2019- *Indian Economy*. Himalaya Publishing House, New Delhi 2019.
- Jalan, Bimal. *Indian Economy: Problems and Prospects*. Penguin India; New edition, 2004.
- Kapila, Uma. – *Indian Economy since independence: A Comprehensive and Critical Analysis of Indian Economy 1947-2019*. Academic Foundation, New Delhi 2019.
- Dipak Mazumdar and Sandeep Sarkar, 2009, —The Employment Problem in India and the Phenomenon of the \_Missing Middle, *Indian Journal of Labour Economics*.
- J. Dennis Rajakumar, 2011, —Size and Growth of Private Corporate Sector in Indian Manufacturing, *Economic and Political Weekly*, April.
- Ramesh Chand, 2010, —Understanding the Nature and Causes of Food Inflation, *Economic and Political Weekly*, February.
- Bishwanath Goldar, 2011, —Organized Manufacturing Employment: Continuing the Debate, *Economic and Political Weekly*, April.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO304	Advanced Econometrics	Core	4	0	0	4

**Course Description:** This course provides a comprehensive introduction to some of the advanced econometric concepts and techniques. The course begins with an introduction to lag modelling and covers distributed as well as dynamic models. Then the students will be introduced to the world of Simultaneous Equation Models and deals in depth with the issue of simultaneity and its solutions. The students will then be introduced to the analysis of two major types of data used in econometric analysis viz. time series and panel data. The course also covers different approaches to econometric forecasting. Some of the important testing procedures such as Granger Causality, Unit root tests, Seasonality tests, Structural break test, Cointegration test and Model stability tests will be introduced to the students during this course.

**Course Objectives:**

- To provide students working knowledge of basic concepts in time series econometrics
- To acquaint students with the methods of dynamic econometric methods and simultaneous equations
- To enable students to forecast using econometric methods and model volatility

**Course Outcomes:**

- Understand and apply basic time series techniques to empirical data
- Work with simultaneous equations and dynamic models
- Forecast using econometric methods and model volatility in data

**UNIT I**

**Time Series Econometrics – Basic Concepts:** Introduction to Time Series; Stationary and Non-stationary Time Series; Spurious Regression; Unit Root Tests: Dickey Fuller and Augmented Dickey Fuller Tests; Transforming Nonstationary Time Series; Cointegration: Testing for Cointegration, Error Correction Mechanism; Granger Causality Test.

**UNIT II**

**Dynamic Econometric Models:** Lags in Econometric Models; Distributed Lag Model; Autoregressive Lag Model; Reasons for Lags; Estimation of Distributed-Lag Model, The Koyck Approach to Distributed-Lag Model.

**UNIT III**

**Simultaneous Equation Models:** Nature of Simultaneous-Equations Models; Simultaneous Equation Bias; Structural Models; Reduced Form Models; Identification Problem; Rules of Identification; Tests for Simultaneity and Exogeneity; Method of Indirect Least Squares; Method of Two-Stage Least Squares

#### UNIT IV

**Time Series Econometrics – Forecasting:** Approaches to Economic Forecasting; ARIMA Models; The Box-Jenkins Methodology; Vector Autoregression; Forecasting with VAR; Testing Causality using VAR.

#### UNIT V

**Volatility Modelling:** Introduction to ARCH, GARCH Models-Applications- ARCH M-FIGARCH-Properties of GARCH Process -Fit and Diagnostics-Other Models of Conditional Variance.

#### Readings:

#### References

- Gujarati, D. N. (2016). *Econometrics by Example* (2nd ed.). New Delhi: Palgrave.
- Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data*. Massachusetts: MIT Press.
- Gujarati, D. N., Porter, D.C., & Gunasekar, S. (2017). *Basic Econometrics*. (5th ed.). New Delhi: McGraw Hill.
- Studenmund, A. H. (2016). *Using Econometrics: A Practical Guide*. (7th ed.). New Delhi: Pearson.

#### Recommended Readings

- Enders, W. (2013). *Applied Econometric Time Series* (3rd ed.). New York: John Wiley & Sons.
- Greene, W. H. (2003). *Econometric Analysis* (5th ed.). New Delhi: Pearson Education.
- Hamilton, J. D. (1994). *Time Series Analysis*. Princeton: Princeton University Press.
- Koutsoyiannis, A. (1973). *Theory of Econometrics*. New York: Harper & Row.
- Pindyck, R. S., & Rubinfeld, D. L. (1990). *Econometric Models and Econometric Forecasts* (4th ed.). New York: McGraw-Hill.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO305	Environmental Economics and Policies	Core	4	0	0	4

**Course Description:** This is an introductory course in environmental economics at the undergraduate level. This course familiarizes the students with the environmental challenges, ranging from air pollution to water crises, and their challenges. Additionally, students will also be exposed to the importance of climate change and sustainable development.

**Course Objectives:**

- To understand the economic perspectives on challenging environmental issues.
- To understand human economy and environmental linkages.
- To understand public goods, externalities, and market failure.
- To examine environmental policy measures and introduction to environmental valuation.

**Course Learning Outcomes:**

- Gain a foundational understanding of economic principles relevant to environmental issues.
- Limitations of economic analysis of environmental issues.
- Application of economic theories and formulation of views on the potential of economics.

**UNIT I**

**Introduction:** Nature and scope, overview of environmental issues, concept of ecological economics, human economy and environmental linkages, national income and environmental accounting, economic perspectives on the environment

**UNIT II**

**Public goods and Externalities:** Environmental externalities, market inefficiencies, resource allocation, common property, tragedy of commons and public goods

**UNIT III**

**Environmental Policy and Valuation:** Theory of environmental policy, Cost benefit analysis, environmental valuation methods, stated preference, revealed preference and production function approach, environmental regulation, command and control versus economic

instruments, Coase the theorem, Pigouvian tax, global managing of renewable energy resources, energy and environment interaction, trade, and environmental valuation.

#### **UNIT IV**

**Sustainable Development and Global climate change:** Introduction to SDGs, Weak vs Strong sustainability, economics of global climate change, sustainable development metrics, Environmental laws and institutions, environment and its impact on biosphere, environmental institutions, and gross root movements

#### **Readings:**

- Kostlad, Intermediate Environmental Economics, Oxford University Press
- Phanuef and Requate, A Course in Environmental Economics: Theory, Policy and Practice, Cambridge University Press
- Barry.C.Field and Martha K.Field, Environmental Economics: An Introduction, McGraw Hill
- Hamley N., J.F.Shogern and B.White (1997), Environmental Economics in Theory and Practice, Macmillan.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO306	International Economics	Core	4	0	0	4

**Course Description:** This paper aims to provide students with a strong foundation in the principles of international economics which will help them to understand the trade theories and associated policies adopted in various countries. The paper will enable students to understand the impact of globalization on income, employment, and social standards in the current international scenario. The paper covers the pure theory of trade and extensions thereof, commercial policy, economic integration, balance of payments, foreign exchange rate determination, international monetary system, and economic crises in recent times.

**Course Objectives:**

- To introduce the basics of international economics
- To introduce both classical and modern theories of international trade
- To develop a systematic exposition of models that try to explain the composition, direction, and consequences of international trade and the determinants and effects of trade policy.

**Course Learning Outcomes:**

- Understand the basics of international economics.
- Demonstrate their understanding of the economic concepts of trade theory.
- Deal with simple algebraic problems that will help them to better understand these concepts, use diagrammatic analysis to demonstrate and compare the economic welfare effects of free trade and protection, demonstrate their understanding of the usefulness and problems related to topics in international trade, and demonstrate their critical understanding of trade policies.

**UNIT I**

**Introduction and Essentials:** The Subject Matter of International Economics; Trade Based on Absolute Advantage; Trade Based on Comparative Advantage; Misconceptions about comparative advantage; Comparative advantage in practice.

**UNIT II**

**The Standard Theory of International Trade, Offer Curves and the Terms of Trade:** The Basis for and the Gains from Trade with Increasing Costs; Trade Based on Differences in Tastes; The Equilibrium Relative Commodity Price with Trade – Partial Equilibrium Analysis & General Equilibrium Analysis; Terms of trade.

### **Unit III**

**The Heckscher - Ohlin Theory, Economies of Scale, Imperfect Competition, and International Trade:** Heckscher-Ohlin Theory; Factor-Price Equalization, Effect of Trade on Income Distribution; Empirical Tests of the Heckscher-Ohlin Model–The Leontief Paradox; Empirical relevance of the H-O theory in the current period; Economies of Scale and International Trade; Imperfect Competition and International Trade-Intra industry trade; Technological gap and Product Cycle models.

### **UNIT IV**

**Trade Restrictions: Tariffs and Nontariff Trade Barriers; and Economic Integration:** Partial Equilibrium Analysis of a Tariff; General Equilibrium Analysis of a Tariff in a Small Country – Import Quotas; Other Non-tariff Barriers; Neo- Protectionism; Trade-Creating Customs Unions; Trade-Diverting Customs Unions; Multilateralism –WTO.

### **UNIT V**

**The Balance of Payments, Foreign Markets and Exchange Rate Determination:** Balance of Payments–Principles; Functions of the Foreign Exchange Markets; Foreign Exchange Rates; Purchasing Power Parity Theory; Stable and Unstable Foreign Exchange Markets.

#### **Reading:**

- Dominick Salvatore, International Economics: Trade and Finance, John Wiley International Student Edition, 12th edition, 2016.
- Krugman, P., Obstfeld, M., Melitz, M. (2018). International Economics -Theory and Policy, 11th ed. Pearson Education.
- Marrewijk, C.V. (2007). International Economics: Theory, Application, and Policy. Oxford University Press.
- Bowen, H., Hollander A. & Viaene J. (2012). Applied International Trade Analysis. London: Macmillan Publication.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO401	Time-Series Econometrics	Core	4	0	0	4

**Course description:** This course focuses on to understand fundamental concepts of Time-series Econometrics with its practical applications. It also introduces the basics of Cointegration and Error-Correction Models. The course helps in gaining working knowledge to model volatility.

**Course Objectives:**

- To understand fundamental concepts of Time-series Econometrics with its practical applications.
- To introduce the basics of Cointegration and Error-Correction Models.
- To introduce the basics of Modelling Volatility.

**Course Outcomes:**

- Apply various Time-series models.
- Apply various Cointegration and Error-Correction Models.
- Gain working knowledge to Model Volatility.

**Unit I**

**Introduction:** Basic Concepts- Stochastic Processes-Unit Root Stochastic Process- Integrated Stochastic Processes- Tests of Stationarity.

**Unit II**

**Cointegration and Error-Correction Models:** Linear Combination of Integrated Variables- Cointegration and Common Trends- Cointegration and Error Correction- Testing of Cointegration: The Engle Granger Methodology- Johansen Methodology- Error-Correction and ADL Tests.

**Unit III**

**Time-series Models and Economic Forecasting:** AR, MA, and ARIMA Modelling of Time Series Data - The Box-Jenkins (BJ) Methodology- Vector Autoregression (VAR)- Granger Causality Test - Vector Error Correction Model.

**Unit IV**



**Modelling Volatility:** ARCH Processes- The GARCH Model- The IGARCH Model - Models with Asymmetry: TARCH and EGARCH.

**Readings:**

- Gujarati, D.N. (2004) Basic Econometrics. 4th Edition, McGraw-Hill Companies
- Enders, W. (2014) Applied Econometric Time Series. 4th Edition. John Wiley, New York.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO402	Research Methodology	Core	4	0	0	4

**Course Description:** This course is devoted to methods and statistics that are required to develop skills to undertake research. Research Methodology deals with the general logic of scientific inquiry, research design, sampling, measurement, and the techniques of certain “structured” and “unstructured” methods of data collection. By the end of this course, the student should be able to conceptualize a research problem and develop a number of complementary designs, measurement, and data collection approaches to bring evidence to bear on the problem. Basically, the student will be equipped to prepare a research proposal, and critically evaluate the quality of evidence in published social sciences research.

**Course Objectives:**

- To provide students working knowledge of basic concepts of research in Social Sciences
- To acquaint students with the methods of research
- To introduce students to academic writing and software application

**Course Outcomes:**

- Understand and apply basic concepts of research in economics
- Work with introductory methods of research
- Gain an overview of the research process and get acquainted with academic writing and software applications

### UNIT I

**Research In Social Sciences:** What social research is and how it differs from decision support systems, Different types of research studies, Nature of the research process, Ethics in Social Sciences Research. The purposes and process of exploratory research. Two types and three levels of research decision-related secondary sources.

### UNIT II

**Thinking Like A Researcher:** The terminology used by professional researchers employing scientific thinking. What you need to formulate a theoretically grounded research hypothesis. The need for sound reasoning to enhance business research results.

### UNIT III

**Research Process – An Overview:** Research is decision- and dilemma-centered, Research question, analysis and direction for the research, value assessments, data collection, data analysis, and reporting. Stages of research design.

#### UNIT IV

**Academic Writing and Software Application:** Literature Review, Descriptive, Persuasive, Expository and Narrative writing, Weaving together critical thinking, logic and evidence, Technicalities of grammar and syntax, Formatting, and citations. Software tutorials, practical assignments and exercises, case studies, live projects

#### Readings:

- Alasuutari, P., Bickman, L., & Brannen, J. (2009). The SAGE handbook of social research methods. Los Angeles: Sage.
- Bailey, K. D. (1994). Methods of social research. New York: Toronto.
- Becker, H., & Richards, P. (2007). Writing for social scientists. Enskede: TPB.
- Bhandarkar. (2010). Methodology and techniques of social research. Delhi: Himalayan Books.
- Cooper, D. R., & Schindler, P. S. (2014). Business research methods. New York, NY: McGraw-Hill/Irwin.
- Howitt, D., & Cramer, D. (2011). Introduction to Research Methods. Welwyn Garden City: Pearson Education UK.
- Matthews, B., & Ross, L. (2010). Research methods. Harlow: Pearson Education.
- May, T. (2011). Social research: Issues, methods and process. Maidenhead, Berkshire: Open University Press.
- Neuman, W. (2011). Social research methods (7th ed.). Boston: Allyn & Bacon.
- Neuman, W. L. (2011). Social research methods qualitative and quantitative approaches. Boston: Pearson Education.
- O'Leary, Z. (2010). Researching real-world problems. London [u.a.]: Sage.
- O'Leary, Z. (2017). The essential guide to doing your research project. London: Sage.
- Thomas, C., & Maurice, S. (2013). Managerial economics (11th ed.). McGraw Hill Higher Education.
- Van Zyl, L., Salkind, N., & Green, S. Research methodology for the economic and management sciences.
- Krishnaswamy, O.R. Methodology of Research in Social Sciences, Himalaya publishing House, 2016.

- Wilkinson and Bhandarkar Methodology and Techniques of Social Research, Himalaya Publishing House, 2016.
- Kothari R.C. Research Methodology, Methods and Techniques, New Age International Publishers, Iind revised edition, reprint 2019.
- Cooper D. and Schindler P. Business Research Methods, Tata McGraw Hill. Sultan Chand & Sons, 2014.

Course Code	Course Name	Course Category	Credits			
			L	T	P	C
ECO403	Research Design Seminar	Core	4	0	0	4

**Course Description:** This seminar is designed to introduce undergraduate students to the fundamental principles and techniques of research design. The course aims to equip students with the skills necessary to formulate and conduct rigorous research, understand various research methodologies, and critically evaluate existing research designs.

**Course Objectives:**

- Provide students with a solid foundation in research design
- Prepare them for further academic pursuits or professional endeavors that require research skills.
- Enhance students' critical thinking and analytical abilities.

**Course Outcomes:**

- Enable students to develop a taste for research
- Provide them with background for further research endeavors
- Acquaint students with the methods of research

### UNIT I

**Introduction to Research Design:** Definition of research design; Importance of research design in the research process; Overview of different research paradigms; Formulating Research Questions and Hypotheses: Strategies for developing clear and focused research questions; Constructing testable hypotheses; Aligning research questions with the chosen research design

### UNIT II

**Literature Review:** Importance of literature review in research design; Techniques for conducting a comprehensive literature review; Identifying gaps and building on existing research

### UNIT III

**Quantitative Research Design:** Experimental design principles; Non-experimental designs (observational, survey, correlational); Sampling techniques and sample size determination

#### UNIT IV

**Qualitative Research Design:** Data collection methods (interviews, focus groups, participant observation); Rigor and trustworthiness in qualitative research

#### UNIT V

Statistical analysis for quantitative data; Thematic analysis, content analysis, and other qualitative data analysis techniques; Interpretation of research findings

#### UNIT VI

**Research Ethics:** Ethical considerations in research design; Informed consent, confidentiality, and participant rights; Institutional Review Board (IRB) processes

#### Readings:

- *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* by John W. Creswell
- *Research Methods in Education* by Louis Cohen, Lawrence Manion, and Keith Morrison
- *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* by John W. Creswell
- *Experimental and Quasi-Experimental Designs for Generalized Causal Inference* by Donald T. Campbell and Julian C. Stanley
- *The Craft of Research* by Wayne C. Booth, Gregory G. Colomb, and Joseph M. Williams
- *Ethics in Research with Human Participants* by Bruce D. Bartholow
- *A Guide to the Project Management Body of Knowledge (PMBOK Guide)* by Project Management Institute (PMI)
- *Designing and Conducting Mixed Methods Research* by John W. Creswell and Vicki L. Plano Clark