

FACULTY OF ECONOMICS & BUSINESS

SYLLABUS

For

**Bachelor of Science (Economics)/Bachelor of Arts
Honours
Four-Year Degree Program**

(Semester I-VI)

**(Under Credit-Based Continuous Evaluation Grading System)
(12+3 System of Education)
Session: 2026–27**



**The Heritage Institution
Kanya Maha Vidyalaya, Jalandhar
(Autonomous)**

**Bachelor of Science (Economics)/Bachelor of Arts
Semester–I**

Session 2026-27

Course Code: BECL-1175/BARL-1175

Economics (Microeconomics)

Course outcomes:

After passing this course, students will be able to

CO1: describe and apply the methods of analyzing consumer behavior through demand and supply, elasticity and utility.

CO2: learn about the various cost and revenue curves and the production function.

CO3: learn about various market structures.

CO4: understand various theories of rent, interest, profit, and distribution.

Bachelor of Science (Economics)/ Bachelor of Arts

Semester I

Session 2026-27

Course Code: BECL-1175/BARL-1175

Economics (Microeconomics)

Time: 3 Hours

L-T-P (Credits):4-0-0

Max. Marks: 100

Theory: 70

CA: 30

Note: Instructions for the Paper Setter:

Two questions, each carrying 14 marks, from each of the Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT-I

Introductory: Definition of Economics, Nature, Scope, and Assumptions of Microeconomics. Basic Economic Problems

Demand Function, Supply Function, Price Determination, Elasticity of Demand – Price, Income and Cross elasticities and their Measurement.

Utility Analysis: Law of Diminishing Marginal Utility and Law of Equi-Marginal Utility, Indifference Curve Analysis

UNIT-II

Theory of Production and Costs: Concept of Production Function. Laws of Returns to Scale and Law of Variable Proportions

Cost: Concepts and Cost Curves in the short and in the long run; Traditional and Modern Cost Theories,

UNIT-III

Market forms: Perfect Competition- Assumptions, Price and Output determination of firm and Industry in the short run and long run; Monopoly- Assumptions and Equilibrium.

Monopolistic Competition- Assumptions and Equilibrium (except Group Equilibrium).

UNIT-IV

Rent: Concept, Ricardian Theory and Modern Theory of Rent.

Interest: Concept, Classical Theory, Loanable Funds Theory.

Profit: Concept, Risk and Uncertainty Theories.

Case Study: Elasticity of Demand and Monopolistic Competition

Suggested Readings:

1. Ahuja, H.L. (3018), *Advanced Economics Theory: Micro Economics analysis*, S. Chand Publishing, New Delhi

2. Dwivedi, D.N. (3018), *Microeconomics: Theory and Applications*, Pearson Education, New Delhi.

3. Koutsoyiannis, A. (3015), *Modern Microeconomics*, Macmillan Press, London.

4.Sen, A.(3007), *Microeconomics: Theory and Applications*, Oxford University Press, New Delhi.

Note: The latest editions of the books are recommended.

Bachelor of Science (Economics)/Bachelor of Arts
Semester –II
Session 2026-27
Course Code: BECL-2175/BARL-2175
Economics (Macroeconomics)

Course outcomes:

After passing this course, students will be able to:

- CO1:** learn the determination of equilibrium in the economy using Classical and Keynesian models and understand the consumption behaviour of an economy.
- CO2:** understand the investment behaviour of an economy and different theories of the trade cycle.
- CO3:** understand the nature and functions of money and the role of financial markets and institutions in the economy.
- CO4:** understand the causes and solution to the problem of inflation and study the macroeconomic policies.

Bachelor of Science (Economics)/Bachelor of Arts
Semester –II
Session 2026-27
Course Code: BECL-2175/ BARL-2175
Economics (Macroeconomics)

Time: 3 Hours

L-T-P (Credits):4-0-0

Max. Marks: 100

Theory: 70

CA: 30

Note: Instructions for the Paper–Setter:

Two questions, each carrying 14 marks, from each of the Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Distinction between Micro and Macro Economics; Say's Law of Market and Aggregate Demand and Aggregate Supply, Determination of Income and Employment: Classical and Keynesian Models. Consumption Functions; average (short-run and long-run) and marginal propensity to consume; Keynes' Psychological Law of Consumption, Multiplier: Meaning and its working.

UNIT–II

Investment: Meaning, Investment Demand Schedules and factors affecting investment decisions. Marginal Efficiency of Capital, Accelerator, Multiplier-Accelerator Interaction. Trade cycles- Meaning, Characteristics and Phases,

UNIT–III

Money: Its functions and role. Money and Capital Markets (Introductory); Quantity Theory of Money: Fisher's and Cambridge's Equations, Liquidity Preference Theory.

UNIT–IV

Inflation: Concept, Causes and Cures. Inflation-unemployment Trade-off (only Phillips' contribution). Macroeconomic Policies: Fiscal Policy – meaning, objectives and instruments. Monetary Policy- meaning, objectives and instruments.

Seminar: Monetary and Fiscal Policy of India

Suggested Readings:

1. Shapiro E. (2013), *Macroeconomic Analysis*, Galgotia Publications.
2. Dwivedi D.N. (2018), *Macroeconomics: Theory and Policy*, Tata McGraw-Hill, New Delhi.

Note: The latest editions of the books are recommended.

Bachelor of Science (Economics)/Bachelor of Arts

Semester –I

Session: 2026-27

Course Code: BECL-1453/BARL-1453

Quantitative Techniques–I

Course outcomes:

After passing this course, students will be able to:

CO1: organize, manage and present data.

CO2: analyze the data by using central tendency, dispersion and skewness.

CO3: learn the relationship between variables and prediction using correlation and regression.

CO4: compare magnitudes of related variables to each other over a period of time with the help of index numbers and understand the concept of time series in analyzing economic problems.

Bachelor of Science (Economics)/Bachelor of Arts

Semester –I

Session 2026-27

Course Code: BECL-1453/BARL-1453

Quantitative Techniques (Quantitative Techniques–I)

Time: 3 Hours

L-T-P (Credits):4-0-0

Max. Marks: 100

Theory: 70

CA: 30

Note: Instructions for the Paper–Setters:

Two questions, each carrying 14 marks, from each of Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Statistics: Definition, Scope in Economics, Significance, Limitations. Classification, Tabulation, Diagrammatic and Graphical Representation of Data.

UNIT–II

Concepts and Measures of Central Tendency: Means, Median, Mode and GM; Concepts and Measures of Relative Dispersion

UNIT–III

Correlation Analysis: Introduction, Importance, Karl-Pearson's Coefficient of Correlation, Spearman's Rank Correlation Coefficient, Simple Regression Analysis; Difference Between Correlation and Regression, Lines of Regression, Properties of Correlation and Regression Coefficients (Stress on Numerical Examples).

UNIT–IV

Index Numbers: Concept of Index Number, Purpose Construction & Problems, Laspeyre's, Paasche's and Fisher's Formulae, Tests of Consistency

Analysis of Time Series: Definition, Components of Time Series, Measurement of Trend by Different Methods (Stress on Examples).

Suggested Readings:

1. Gupta, S.P. (3014), *Statistical Methods*, Sultan Chand & Sons, New Delhi.
2. Croxton, F.E., Cowden D.J. and Klein, S. (1973), *Applied General Statistics*, 3rd. Ed., Prentice Hall of India, New Delhi.
3. Nagar, A.L. and Das, R.K. (1976), *Basic Statistics*, Oxford University Press, Bombay.

Note: The latest editions of the books are recommended.

Bachelor of Science (Economics)/Bachelor of Arts
Semester –II
Session 2026-27
Course Code: BECL-2453/BARL-2453
Quantitative Techniques (Quantitative Techniques–II)

Time: 3 Hours

L-T-P (Credits):4-0-0
Max. Marks: 100
Theory: 70
CA: 30

Note: Instructions for the Paper–Setters:

Two questions, each carrying 14 marks, from each of Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

SECTION–A

Solution of Linear Equations: Solution of Simultaneous Linear Equations (up to two variable case), Application of Linear Equation in Economics; Solution of Quadratic Equations. Series: Arithmetic Progression Series, Geometric Progression Series and their applications in economics.

SECTION–B

Elements of Analytical Geometry: Straight line; Concepts of combination and permutation, Elements of set theory, union, intersection, difference, symmetric difference, complementation, Venn diagrams.

SECTION–C

Difference between a constant and a variable, concept of functions, classifications of functions, graph of linear and quadratic functions (Economic applications). Limits and continuity of a function. Concept of differentiation (ab-initio principle).

SECTION–D

Derivatives (Excluding Trigonometric/ and Inverse Functions): Rules of derivatives; functions of functions rule; derivatives of implicit functions, parametric functions, exponential functions, logarithmic functions (Application in Economics).

Books Recommended

1. Monga, G.S.: Mathematics and Statistics for Economics
2. Yamane, Taro: Mathematics for Economists.
3. Allen, R.G.D.: Mathematical Analysis for Economists.
4. Edward T Dowling: Introduction to Mathematical Economics.

Bachelor of Science (Economics)/Bachelor of Arts

Semester –III

Session 2026-27

Course Code: BECL-3175/BARL-3175

Economics (Indian Economy)

Course Outcomes:

After passing this course, students will be able to:

- CO1:** understand the nature, importance and problems of Indian agriculture and new agriculture strategy and WTO agreements related to Indian agriculture.
- CO2:** Critically understand the industrial development in India, the role of the public and private sectors, the cottage and small industries, and the latest industrial policy.
- CO3:** understand the composition, direction, and volume of international trade along with the balance of payment problems and the role of foreign capital MNCs.
- CO4:** understand major economic problems of the Indian economy, Indian Taxation System, and Indian economic planning – its objectives, strategy and evaluation.

Bachelor of Science (Economics)/Bachelor of Arts

Semester –III

Session 2026-27

Course Code: BECL-3175/BARL-3175

Economics (Indian Economy)

Time: 3 Hours

L-T-P (Credits):4-0-0

Max. Marks: 100

Theory: 70

CA: 30

Note: Instructions for the Paper–Setter:

Two questions, each carrying 14 marks, from each of the Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT- I

Nature of Indian Economy; Agriculture in India: Nature and Importance of Agriculture, Causes of Decline in Productivity, Sustainable Agricultural Growth, Green Revolution and New Agricultural Strategy

UNIT- II

Industry: Performance and Problems of Industrial Development; Public Sector versus Private Sector, Role of Privatization, Role of Small and Cottage Industries, Latest Industrial Policy.

UNIT- III

Foreign Trade: Direction and Composition of Exports and Imports since 1991; Recent Foreign Trade Policy, Balance of Payment Problem, Foreign Capital and Multinational Corporations in India
Economic Reforms and its implications.

. UNIT- IV

Features of Population Growth in India, Major Problems of the Economy – Inflation, Unemployment, Poverty and Inequality, Current Indian Tax Structure. Role and functions of Niti Ayog

Case Study: Population dynamics and nature of the unemployment problem in Punjab

Suggested Readings:

1. Mishra, S.K. and Puri, V.K. (3019), *Indian Economy*, Himalaya Publication House, Mumbai.
2. Dutt, R. and Sundharam, K.P.M. (3018), *Indian Economy*, S. Chand & Co. Ltd., New Delhi.
3. Aggarwal, A. N. (1975), *Indian Economy*, Vikas Publishing House, Delhi.
4. Wadhwa, C. D. (1970), *Indian Economic Policy*, Tata McGraw Hill, Bombay.

Note: The latest editions of the books are recommended.

Bachelor of Science (Economics)/Bachelor of Arts

Semester –III

Session 2026-27

Course Code: BECL-3453/BARL-3453

Quantitative Techniques (Quantitative Techniques–III)

Course outcomes:

After passing this course, students will be able to:

- CO1:** understand and apply the concept of differentiation in economic applications such as profit maximization, cost minimization or utility optimization.
- CO2:** understand and apply the concept of indefinite and definite integrals to economic concepts like consumer and producer surplus.
- CO3:** explain and use matrix operations to solve the system of equations.
- CO4:** understand the basics of linear programming for the efficient computation of optimal solutions to problems in decision-making.

Bachelor of Science (Economics)/Bachelor of Arts

Semester –III

Session 2026-27

Course Code: BECL-3453/BARL-3453

Quantitative Techniques (Quantitative Techniques–III)

Time: 3 Hours

L-T-P (Credits):4-0-0

Max. Marks: 100

Theory: 70

CA: 30

Note: Instructions for the Paper–Setter:

Two questions, each carrying 14 marks, from each of the Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT-I

Differentiation: Maxima and Minima of Functions, Partial derivatives, higher order partial derivatives.

UNIT-II

Integration (Excluding Trigonometric and Inverse Functions): Indefinite Integrals; Integration by Partial Fractions; Integration by substitution; Integration by parts; Definite Integrals; Application of Integration in Consumer Surplus and Producer Surplus.

UNIT-III

Matrices: Definition, Types, Addition, Subtraction, and Multiplication of Matrices; Scaler Multiplication; Transposition; Determinants and their Properties; Minors and Co-factors; Rank of a Matrix; Inverse of a Matrix; Crammer's Rule for Solution of Simultaneous system of equations; Applications of matrices in economics.

UNIT-IV

Linear Programming: Formulation of problem, Assumptions, Graphical solution, Simplex method, Use of Artificial Variables, Dual Simplex method. Input-Output Analysis: Basic concepts, Input-Output tables for closed and open economies, Leontief Basic Input-Output Model

Suggested Readings:

1. Rangi, S.S. and Chowdhary, V. (2013), *Mathematical Techniques*, S. Vikas s& Co. Publishing House, India.
2. Allen, R.G.D.(1938), *Mathematical Analysis for Economists*, ELBS and Macmillan Press, New York.
3. Chiang, A.(1967), *Fundamental Methods of Mathematical Economics*, McGraw Hill.

Note: The latest editions of the books are recommended.

Bachelor of Science (Economics)/Bachelor of Arts

Semester –IV

Session 2026-27

Course Code: BECL-4175/BARL-4175

Economics (International Economics)

Course outcomes:

After studying this course, students will be able to:

CO1: understand the theories of trade and terms of trade .

CO2: understand the tariff and non-tariff barriers

CO3: understand the basic concept of BOP and methods to correct disequilibrium

CO4: understand the determination of exchange rate and working of international organizations

Bachelor of Science (Economics)/Bachelor of Arts

Semester –IV

Session 2026-27

Course Code: BECL-4175/BARL-4175

Economics (International Economics)

Time: 3 Hours

L-T-P (Credits): 4-0-0

Max. Marks: 100

Theory: 70

CA: 30

Note: Instructions for the Paper–Setter:

Two questions, each carrying 14 marks, from each of the Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Theories of International Trade: Theories of absolute advantage, comparative advantage and Heckscher-Ohlin theory of trade: assumptions and main features, Terms of trade and offer curve.

UNIT–II

Commercial Policy: Tariff barriers; Definition and its types and non-tariff barriers to trade (quota, voluntary export restraints, export subsidies, dumping and international cartel); Tariff and quota (partial equilibrium analysis).

Unit-III

Balance of Trade and Balance of Payments: Meaning, Concepts and components of balance of payments; causes and various measures to correct deficit in the balance of payment (Devaluation, Absorption and Monetary approaches)

Unit- IV

Rate of Exchange: Meaning, concept of equilibrium exchange rate and determination; Fixed versus flexible exchange rates. International Monetary System and International Institutions: World Bank and IMF; Objectives and functions

Seminar: India's EXIM Policy

Suggested Readings:

1. Sodersten, B.O. (1970), *International Economics*, Macmillan, London.
2. Salvatore, D. and Reed, G. (1983), *International Economics*, Macmillan Publishing Company, New York.
3. Yeagre (1976), *International Monetary Relations, Theory, History and Policy*, Harper and Row, New York, 1976.
4. International Economics, Vikas Publishing House Pvt.

Note: The latest editions of the books are recommended.

Bachelor of Science (Economics)/Bachelor of Arts

Semester –IV

Session: 2026-27

Course Code: BECL-4453/BARL-4453

Quantitative Techniques (Quantitative Techniques–IV)

Course outcomes:

After passing this course, students will be able to:

- CO1:** understand the concept of correlation and regression and learn how to apply these statistical techniques in practice
- CO2:** understand the axiomatic formulation of modern probability theory and think of random variables as an intrinsic need for the analysis of random phenomena.
- CO3:** recognize the connection between theory and applications by appropriately fitting, assessing and interpreting the results/ outcomes
- CO4:** understand the basic principles underlying survey design and estimation.

Bachelor of Science (Economics)/Bachelor of Arts

Semester –IV

Session 2026-27

Course Code: BECL-4453/BARL-4453

Quantitative Techniques (Quantitative Techniques–IV)

Time: 3 Hours

L-T-P (Credits):4-0-0

Max. Marks: 100

Theory: 70

CA: 30

Note: Instructions for the Paper Setter:

Two questions, each carrying 14 marks, from each of the Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Multiple Linear Regression: Concepts, Estimation and Applications (without derivations). Partial and Multiple Correlation. Non-Linear Regression: Quadratic and Exponential; Estimation of Fitting of Various Growth Curves (Modified Exponential, Gompertz).

UNIT–II

Probability: Definition, Additive & Multiplicative Laws and their Applications, Bayes Theorem, Concept of Random Variable, Probability Mass Function & Density Function, Mathematical Expectation (meaning and properties), Moments, Moment Generating Function and Characteristic Function.

UNIT–III

Theoretical Probability Distributions: Derivations of the properties of Binomial (with numerical), Poisson (with numerical), Normal (with numerical), Beta and Gamma Distributions.

UNIT–IV

Sampling: Various concepts – Population, Sampling Units, Complete Enumeration sample Surveys, Concept of an Estimator and The Standard Error, Standard Error of Estimates. Features of a Good Sample, Random and Subjective Sampling, Simple Random Sampling (with and without replacement), and Stratified Random Sampling (applications only).

Practical: Correlation and Regression with Statistical Softwares

Bachelor of Science (Economics)/Bachelor of Arts

Semester –V

Session 2025-26

Course Code: BECL-5175/BARL-5175

Economics (Economics of Development)

Course outcomes:

After passing this course, students will be able to:

- CO1:** learn the measurement of economic development and understand the economic problems of developing and least developed countries
- CO2:** examine the models of growth critically and recognize the importance of their underlying assumptions
- CO3:** analyze the different strategies of economic development and policy implications of export promotion and import substitution strategies
- CO4:** understand the role of planning and contribution of capital formation and choice of techniques in the development of UDCs and their changing landscape after globalization and liberalization

Bachelor of Science (Economics)/Bachelor of Arts

Semester –V

Session 2025-26

Course Code: BECL-5175/BARL-5175

Economics (Economics of Development)

Time: 3 Hours

L-T-P (Credits):4-0-0

Max. Marks: 100

Theory: 70

CA: 30

Note: Instructions for the Paper Setter:

Two questions, each carrying 14 marks, from each of the Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT-I

Economic Development: Meaning and Measurement, Economic and Non-Economic Factors, Characteristics of Developing and Least Developed Countries. Human Development Index, Concept of Sustainable Development.

UNIT-II

Models of Growth: Classical, Marxian, Schumpeter, Harrod-Domar, and Solow's Growth Models

UNIT-III

Rostow's theory of Stages of Growth

Strategies of Economic Development-Balanced vs. Unbalanced Growth; Theory of Big Push; Leibenstein's Critical Minimum Efforts Thesis

Export Promotion and Import Substitution.

UNIT-IV

Capital Formation – Meaning and Sources; Choice of Techniques

Role of Planning in Under Developed Countries, Need, Objective, Strategy

Case Study: Growth Models for the development of different areas of Punjab

Suggested Readings:

1. Meier, G.M.(1995), *Leading Issues in Economic Development*, Oxford University Press, Delhi.
2. Thirlwall, A.P. (2011), *Economics of Development*, Palgrave Macmillan.
3. Todaro, M.P. and Smith, S.C. (2018), *Economic Development*, Pearson India
4. Misra and Puri (2016), *Economics of Development and Planning*, Himalaya Publishing House, New Delhi
5. Jhingan, M.L.(2011), *The Economics of Development and Planning*, Vrinda Publications Pvt. Ltd., Delhi

Note: The latest editions of the books are recommended.

Bachelor of Science (Economics)/Bachelor of Arts

Semester–V

Session 2025-26

Course Code: BECL-5453/BARL-5453

Quantitative Techniques (Quantitative Techniques–V)

Course outcomes:

After the successful completion of this course, the students will be able to

CO1: understand the basics of methods of estimation and the process of formulation and of testing the hypothesis.

CO2: understand the theoretical details of sampling distributions

CO3: understand the basic applications of sampling distributions.

CO4: understand ANOVA to split and analyze the variations in economic phenomenon.

Bachelor of Science (Economics)/Bachelor of Arts

Semester–V

Session 2025-26

Course Code: BECL-5453/BARL-5453

Quantitative Techniques (Quantitative Techniques–V)

Time: 3 Hours

L-T-P (Credits):4-0-0

Max. Marks: 100

Theory: 70

CA: 30

Note: Instructions for the Paper Setter:

Two questions, each carrying 14 marks, from each of the Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT–I

Statistical Inference: Point & Interval Estimation, Properties of a Good Estimator, Maximum Likelihood Method of Estimation and derivation of mean and variance of Binomial, Poisson and Normal distributions using MLE. Basic Concepts of Null and Alternative Hypotheses, Types of Errors, One-Tailed and Two-Tailed Tests, Power of Test, Critical Region.

UNIT–II

Sampling Distributions: Derivation of properties of Z, T, Chi-Square and F distributions.

UNIT–III

Tests of significance based upon the distribution of Z, t, F and Chi-square.

UNIT–IV

Analysis of Variance: Introduction, Assumptions, Techniques of Analyzing Variance-Analysis of Variance of one-way and two-way classification.

Practical: t-test and one way ANOVA with any Statistical Software

Suggested Readings:

1. Gupta and Kapoor(2014) , *Fundamentals of Mathematical Statistics* , Sultan Chand & Sons, New Delhi
2. Rangi S.S.(2016), *Statistical Techniques*, S. Vikas &Co. (Publishing House) India.

Note: The latest editions of the books are recommended.

Bachelor of Science (Economics)/Bachelor of Arts

Semester –VI

Session 2025-26

Course Code: BECL-6175/BARL-6175

Economics (Quantitative Methods for Economists)

Course outcomes:

After passing this course, students will be able to:

CO1: learn basic techniques of mathematics and their applications in economics

CO2: analyze data by using means of central tendency and dispersion.

CO3: understand the shapes of the curve and the relationship between variables by using techniques of skewness, correlation and learn prediction and forecasting by using regression

CO4: calculate relative changes in the magnitude of related variables using index numbers and also missing values within the data using interpolation

Bachelor of Science (Economics)/Bachelor of Arts

Semester –VI

Session 2025-26

Course Code: BECL-6175/BARL-6175

Economics (Quantitative Methods for Economists)

Time: 3 Hours

L-T-P (Credits):4-0-0

Max. Marks: 100

Theory: 70

CA: 30

Note: Instructions for the Paper Setter:

Two questions, each carrying 14 marks, from each of the Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

UNIT-I

Sets, Relations and Functions, Limits and Continuity (Basic Concepts), Derivative of simple functions only (excluding log & exponential functions). Maxima/Minima for single variable functions.

UNIT-II

Measures of Central Tendency — Mean, Mode, Median, and Geometric Mean; Measures of Dispersion.

UNIT-III

Concepts and Measures of Skewness: Boyle's & Karl Pearson's Measures. Simple Correlation & Regression (ungrouped & grouped data). Difference between the properties of correlation and regression coefficients

UNIT-IV

Interpolation: Concepts and Methods — Binomial expansion, Newton and Lagrange's Method (with emphasis on missing values only). Price Index Numbers—Weighted and Unweighted Index Numbers, various formulae and consistency tests.

Case Study – Real-Life Examples Based on Central Tendency and Dispersion

Suggested Readings

1. Gupta, S.P. (2014), *Statistical Methods*, Sultan Chand & Sons, New Delhi.
2. Gupta, S.C. (2018), *Fundamentals of Statistics*, Himalaya Publishing House, New Delhi
3. Elhance, D.N. and Elhance, V. (2018), *Fundamentals of Statistics*, Kitab Mahal, Allahabad
4. Croxton, F.E., Cowden, D.J., and Klein. S. (1973), *Applied General Statistics*, 3rd. Ed., Prentice Hall of India, New Delhi.
5. Nagar, A.L. and Das, R.K. (1976), *Basic Statistics*, Oxford University Press, Bombay.
6. Aggarwal, C.S and Joshi, S.C.(2017) ,*Mathematics for Students of Economics*, New Academic Publishing Co., Jalandhar

Note: The latest editions of the books are recommended.

Bachelor of Science (Economics)/Bachelor of Arts
Semester–VI
Session 2025-26
Course Code: BECL-6453/BARL-6453
Quantitative Techniques (Quantitative Techniques–VI)

Course outcomes:

After passing this course, students will be able to:

CO1: understand the nature and methodology of econometrics.

CO2: understand the OLS procedure of estimation of the model and tests of significance.

CO3: understand the nature and solutions of problems associated with the estimation of regression

CO4: understand the basics of dummy variables and estimation of models with lags.

Bachelor of Science (Economics)/Bachelor of Arts

Semester–VI

Session 2025-26

Course Code: BECL-6453/BARL-6453

Quantitative Techniques (Quantitative Techniques–VI)

Time: 3 Hours

L-T-P (Credits):4-0-0

Max. Marks: 100

Theory: 70

CA: 30

Note: Instructions for the Paper Setter:

Two questions, each carrying 14 marks, from each of the Units I-IV (i.e., a total of eight questions) are to be set. Candidates are required to attempt five questions, selecting at least one from each unit. The fifth question may be attempted from any unit.

Unit – I

Definition, Scope and Nature of Econometrics. Simple Linear Regression Model (OLS method) with applications

Unit – II

General Linear Regression Model: assumptions, properties (BLUE). Gauss-Markov Theorem (Two Variable and K-variable). Concepts of R^2 and Adjusted R^2 , Test of Significance (Stress on Numericals)

Unit – III

Econometric Problems of Heteroscedasticity and Multicollinearity in the Regression Analysis: Sources, Consequences, Tests and Remedial Measures. Specification Bias.

Unit – IV

Problem of Auto-Correlation in the Regression Analysis: Sources, Consequences, Tests and Remedial Measures. Distributed Lag Models and Auto-Regressive Models (Introductory). Dummy Variable Technique and its uses.

Practical: Defining Variables and Entering Data, Estimation of Regression with statistical software

Suggested Readings:

1. Madnani GMK, (2015), *Introduction of Econometrics*, Oxford and IBH Publishing, N. Delhi.
2. Koutsoyiannis, A, (2001), *Theory of Econometrics*, The Macmillan Press Ltd., London.

Note: The latest editions of the books are recommended.

