

St. Xavier's College (Autonomous), Ahmedabad

FACULTY OF ARTS

DEPARTMENT OF ECONOMICS (SF)

BA. Hons. (Economics) SF

SEMESTER-4

Minor Course (For Economics students): Statistics for Economics-3

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course			Eligibility Criteria	Pre-requisite(s) of the Course (if any)
	Lectures	Tutorial	Practical / Practice		
Statistics for Economics-3 (ECHMN441C)	4	0	0	10 + 2 from a recognized board in any stream	Previous Semesters

Learning Objectives:

1. Understand probability distributions, sampling concepts, estimation methods, and hypothesis-testing procedures used in economic and social science research.
2. Explain statistical association, regression analysis, experimental methods, causal estimation, and the fundamental properties of estimators.

Course Outcomes:

1. Apply probability distributions, estimation methods, and hypothesis tests to analyse data and draw valid statistical inferences.
2. Perform correlation, regression, and differences-in-means analyses and evaluate estimators in terms of unbiasedness, efficiency, consistency, and asymptotic behaviour.

UNIT 1: Probability Distributions

Random Variables, Probability Distributions, Discrete Random Variables, Continuous Random Variables, Expected Value, Mean, Variance, Standard Deviation, Distribution Shape, Joint Distributions, Marginal Distributions, Conditional Distributions, Independence, Covariance, Correlation, Sums of Random Variables, Normal Distribution, Chi-Squared Distribution, Student's t Distribution, F Distribution

UNIT 2: Sampling and Statistical Estimation

Random Sampling, Population Parameters, Sample Statistics, Sampling Distribution of the Sample Mean, Law of Large Numbers, Central Limit Theorem, Large-Sample Approximations, Point Estimation, Properties of Estimators, Unbiasedness, Sampling Variance, Efficiency, Consistency, Asymptotic Normality, Sample Variance, Sample Standard Deviation, Standard Error, Interval Estimation, Confidence Intervals for Population Means

UNIT 3: Hypothesis Testing and Comparison of Populations

Null and Alternative Hypotheses, One-Sided Tests, Two-Sided Tests, Significance Level, Test Statistics, t-Statistic, p-Values, Type I and Type II Errors, Small-Sample Tests, Large-Sample Tests, Asymptotic Tests, Relationship Between Confidence Intervals and Hypothesis Testing, Statistical Significance, Practical Significance, Comparing Two Means, Independent Samples, Paired Samples, Difference Between Two Population Means, Difference Between Two Population Proportions

UNIT 4: Association, Regression and Causal Estimation

Scatterplots, Sample Covariance, Sample Correlation, Population Correlation, Simple Linear Regression, Population Regression Function, Sample Regression Function, Ordinary Least Squares, Regression Coefficients, Fitted Values, Residuals, Coefficient of Determination, Confidence Intervals for Regression Coefficients, Hypothesis Tests for Regression Coefficients, Prediction, Experimental Data, Treatment and Control Groups, Random Assignment, Differences-in-Means Estimation, Potential Outcomes, Average Treatment Effect, Causal Effect as a Difference in Conditional Expectations

Textbook:

- Appendix Section- Wooldridge (Introduction to Econometrics)
- Review Section- Stock & Watson (Introduction to Econometrics)

Suggestive Reading

1. Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., Cochran, J. J., Fry, M. J., & Ohlmann, J. W. (2020). Statistics for business & economics (14th ed.). Cengage Learning.
2. Larsen, R.J. and M.J. Marx (2017) – An Introduction to Mathematical Statistics and Its Applications, Pearson Education, 6th edition.
3. Wackerly, D., Mendenhall, W., & Scheaffer, R. (2014) – Mathematical Statistics with Applications, Cengage Learning, 7th edition.
4. Hogg, R. V., Tanis, E. A., & Zimmerman, D. L. (2018) – Probability and Statistical Inference, Pearson, 10th edition.
5. Casella, G., & Berger, R. L. (2002) – Statistical Inference, Duxbury Press, 2nd edition.

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DEPARTMENT OF ECONOMICS (SF)

BA. Hons. (Economics) SF

SEMESTER-4

Minor Course: Principles of Economics-3

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course			Eligibility Criteria	Pre-requisite(s) of the Course (if any)
	Lectures	Tutorial	Practical / Practice		
Principles of Economics-3 (ECHMN445C)	4	0	0	10 + 2 from a recognized board in any stream	Previous Semesters

Learning Objectives:

1. Understand how national income, price levels, and economic growth are measured to evaluate the overall performance of an economy.
2. Analyse the relationships between savings, investment, productivity, and long-term economic development using key macroeconomic indicators.

Course Outcomes:

1. Apply macroeconomic measurement tools such as GDP, CPI, and the GDP deflator to assess economic welfare and cost of living.
2. Evaluate the determinants of growth, productivity, and the role of financial systems and policies in promoting economic stability.

Unit-1: Measuring a Nation's Income:

The Economy's Income and Expenditure, The Measurement of GDP, GDP as the Market Value of All Final Goods and Services Produced within a Country in a Given Period, Other Measures of Income, The Components of GDP—Consumption, Investment, Government Purchases, Net Exports, Real versus Nominal GDP, GDP Deflator, Case Studies on Real GDP, GDP and Economic Well-Being, International Differences in GDP and Quality of Life.

Unit–2: Measuring the Cost of Living:

The Consumer Price Index, Calculation of CPI, Contents of the CPI Basket, Problems in Measuring the Cost of Living, GDP Deflator versus CPI, Correcting Economic Variables for Inflation, Dollar Figures from Different Times, Indexation, Real and Nominal Interest Rates, Regional Differences in Cost of Living, Interest Rates in the U.S. Economy.

Unit–3: Production and Growth:

Economic Growth around the World, Productivity and Its Determinants, Importance of Productivity, The Production Function, Natural Resources and Growth, Economic Growth and Public Policy, Saving and Investment, Diminishing Returns and the Catch-Up Effect, Investment from Abroad, Education, Health and Nutrition, Property Rights and Political Stability, Free Trade, Research and Development, Population Growth, Innovation and Growth, Causes of Poverty in Africa, American Prosperity.

Unit–4: Saving, Investment, and the Financial System:

Financial Institutions in the U.S. Economy, Financial Markets and Intermediaries, National Income Accounts—Saving and Investment Identities, The Meaning of Saving and Investment, Market for Loanable Funds, Supply and Demand for Loanable Funds, Saving Incentives, Investment Incentives, Government Budget Deficits and Surpluses, Fiscal Policy and Saving, History of U.S. Government Debt, Financial Crises, Decline in Real Interest Rates, Role of Financial System in Economic Growth.

Textbook:

- Principles of Economics- Mankiw (10th ed.)

Suggestive Reading

1. Principles of Economics – Mankiw (10th ed.), Economics – Samuelson & Nordhaus (19th ed.)
2. Principles of Economics – Case, Fair & Oster (13th ed.)
3. Principles of Microeconomics – Stiglitz & Walsh (2nd ed.)