

**St. Xavier's College (Autonomous), Ahmedabad**

**FACULTY OF ARTS**

**DEPARTMENT OF ECONOMICS (SF)**

**BA. Hons. (Economics) SF**

**SEMESTER-4**

**Minor Course – 1: Statistics for Economics-4**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE**

<b>Course Title &amp; Code</b>	<b>Credit Distribution of The Course</b>			<b>Eligibility Criteria</b>	<b>Pre-requisite(s) of the Course (if any)</b>
	<b>Lectures</b>	<b>Tutorial</b>	<b>Practical / Practice</b>		
Statistics for Economics-4 (ECH-4101)	4	0	0	10 + 2 from a recognized board in any stream	Previous Semesters

**Learning Outcomes (LO):**

1. Understand the principles of regression, ANOVA, and nonparametric statistical methods.
2. Learn how to test hypotheses using parametric and nonparametric methods.

**Course Outcomes (CO):**

1. Conduct and interpret regression analysis and ANOVA in statistical modelling.
2. Apply nonparametric and goodness-of-fit tests for distributional and independence analysis.

**Chapter-1: Regression Analysis**

Simple Linear Regression Model, Estimated Regression Equation, Least Squares Method, Coefficient of Determination, Correlation Coefficient, Model Assumptions, Testing for Significance, t Test, F Test, Confidence and Prediction Intervals, Using Regression for Estimation and Prediction, Residual Analysis, Detecting Outliers and Influential Observations, Multiple Regression Model, Estimated Multiple Regression Equation, Interpretation of Coefficients, Multiple Coefficient of Determination, Multicollinearity, Categorical Independent Variables, Logistic Regression Equation, Significance Testing in Logistic Regression.

**Chapter-2: Time Series Analysis and Forecasting**

Time Series Patterns, Horizontal Pattern, Trend Pattern, Seasonal Pattern, Trend and

Seasonal Pattern, Cyclical Pattern, Selecting a Forecasting Method, Forecast Accuracy, Moving Averages, Weighted Moving Averages, Exponential Smoothing, Linear Trend Regression, Nonlinear Trend Regression, Seasonality Without Trend, Seasonality and Trend, Models Based on Monthly Data, Time Series Decomposition, Calculating the Seasonal Indexes, Deseasonalizing the Time Series, Using the Deseasonalized Time Series to Identify Trend, Seasonal Adjustments, Cyclical Component.

### **Chapter-3: Nonparametric Methods**

Sign Test, Hypothesis Test About a Population Median, Hypothesis Test with Matched Samples, Wilcoxon Signed-Rank Test, Mann-Whitney-Wilcoxon Test, Kruskal-Wallis Test, Rank Correlation.

### **Chapter-4: Decision Analysis**

Problem Formulation, Payoff Tables, Decision Trees, Decision Making with Probabilities, Expected Value Approach, Expected Value of Perfect Information, Decision Analysis with Sample Information, Decision Strategy, Expected Value of Sample Information, Computing Branch Probabilities Using Bayes' Theorem.

Textbook:

- 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.

Suggestive Reading

1. Larsen, R.J. and M.J. Marx (2017) – An Introduction to Mathematical Statistics and Its Applications, Pearson Education, 6th edition.
2. Wackerly, D., Mendenhall, W., & Scheaffer, R. (2014) – Mathematical Statistics with Applications, Cengage Learning, 7th edition.
3. Hogg, R. V., Tanis, E. A., & Zimmerman, D. L. (2018) – Probability and Statistical Inference, Pearson, 10th edition.
4. Casella, G., & Berger, R. L. (2002) – Statistical Inference, Duxbury Press, 2nd edition.