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-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 (ECH-4101)	4	0	0	10 + 2 from a recognized board in any stream	Previous Semesters

LO:

1. Understand inference techniques for comparing two populations, including means, proportions, and variances.
2. Learn how to analyze categorical data and apply experimental design using ANOVA methods.

CO:

1. Perform estimation and hypothesis testing for differences in means, proportions, and variances across populations.
2. Apply chi-square tests and analysis of variance (ANOVA) to real-world categorical and experimental data.

Chapter 1: Inference About Means and Proportions with Two Populations
Inferences About the Difference Between Two Population Means (σ_1 and σ_2 Known), Interval Estimation of $\mu_1 - \mu_2$, Hypothesis Tests About $\mu_1 - \mu_2$, Practical Advice, Inferences About the Difference Between Two Population Means (σ_1 and σ_2 Unknown), Interval Estimation of $\mu_1 - \mu_2$, Hypothesis Tests About $\mu_1 - \mu_2$, Practical Advice, Inferences About the Difference Between Two Population Means: Matched Samples, Inferences About the Difference Between Two Population Proportions, Interval Estimation of $p_1 - p_2$, Hypothesis Tests About $p_1 - p_2$.

Chapter 2: Inferences About Population Variances

Inferences About a Population Variance, Interval Estimation, Hypothesis Testing, Inferences About Two Population Variances.

Chapter 3: Comparing Multiple Proportions, Test of Independence, and Goodness of Fit

Testing the Equality of Population Proportions for Three or More Populations, A Multiple Comparison Procedure, Test of Independence, Goodness of Fit Test, Multinomial Probability Distribution, Normal Probability Distribution.

Chapter 4: Experimental Design and Analysis of Variance

Introduction to Experimental Design and Analysis of Variance, Data Collection, Assumptions for Analysis of Variance, Conceptual Overview, Analysis of Variance and the Completely Randomized Design, Between-Treatments Estimate of Population Variance, Within-Treatments Estimate of Population Variance, The F Test, ANOVA Table, Computer Results, Observational Study Example, Multiple Comparison Procedures, Fisher's LSD, Type I Error Rates, Randomized Block Design, Air Traffic Controller Stress Test, ANOVA Procedure, Computations and Conclusions, Factorial Experiment, ANOVA Procedure.

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.