

Semester	Seven
Course	Major
Paper Number	
Paper Title	Advanced Data Analysis
No. of Credits	6
Theory/Composite/Practical	Practical
Minimum No. of preparatory hours per week a student has to devote	6
Module	NIL
Syllabus	Suggested Problems <i>Advanced Sampling Techniques</i> 1. Systematic Sampling: drawing of sample and estimation. 2. Ratio and Regression estimation: Estimation of population mean/ total and mean squares. Compare the efficiencies of ratio and regression estimators relative to SRS. 3. Cluster sampling: estimation of mean or total, variance of the estimate, estimate of intra-class correlation coefficient, efficiency as compared to SRS. 4. Two stage sampling. 5. Double Sampling. 6. RRT and Snowball sampling. 7. Probability Proportional to size sampling: drawing of sample and estimation of population total. <i>Experimental Design</i> 1. Problems on IBD 2. Problems on randomized response surface <i>Categorical Data Analysis</i> 1. Measures of association for 3x3 contingency table. 2. Conditional and marginal odds ratio. Homogeneous association. 3. Fitting a logit model, Confusion matrix, ROC & AUC, Goodness-of-fit measures. 4. Fitting a probit model, Confusion matrix, ROC & AUC, Goodness-of-fit measure. 5. Fitting a Poisson regression model, Goodness-of-fit measure. <i>Asymptotic Methods</i> 1. Tests of significance and confidence intervals concerning sample standard deviation, coefficient of variation and correlation coefficient (both single sample and two sample cases). 2. Tests of significance and confidence intervals using variance stabilizing transformations. 3. Tests for goodness of fit, independence and homogeneity

	using Pearsonian chi-square statistic <i>Advanced Time Series Analysis</i> 1. Test for randomness of a residual series 2. Fitting Box Jenkins models 3. Exponential smoothing, Holt Winters Method. <i>Demography</i> 1. Measures of mortality 2. Life Tables 3. Measures of fertility and population growth 4. Population Estimation, Projection and Forecasting 5. Fitting of logistic equation by Rhode's method
Learning Outcomes	1. Application of Sample Survey Techniques 2. Application of Design of Experiments 3. Problems on Contingency Tables 4. Application of Generalized Linear Models 5. Application of Large Sample Theory 6. Application of Time Series 7. Application of Demography
Evaluation	Continuous Assessment