

Hard Core	STP 507:Practical V: Based on STH503 and Soft Course 2	No. of credits: 3
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Course Outcomes:

- CO1: Learn estimation of model parameters, inference problems in case of simple and multiple linear regression model
- CO2: Estimate the model parameters of regression model when some of the basic ideal conditions are violated
- CO3: Learn to select the best subsets of regressors for the model.
- CO4: Learn how to use estimated regression models for prediction.
- CO5: Understand the estimation techniques and inference procedure in case of simultaneous equations model
- CO6: Interpretation and critical evaluation of the outcomes of empirical analysis
- CO7: Determine how and when to apply different methods of time series analysis and how to test for goodness of fit using the R software coding and in built packages.
- CO8: To forecast the time series with specific components using stationary methods, trend methods, and seasonal methods.

Practicals based on STH 503: ECONOMETRICS

1. Simple linear regression.
2. Multiple linear regression.
3. Testing the significance of regressors and ANOVA.
4. Restricted least squares estimators and Testing linear restrictions.
5. Residual Analysis
6. Best Linear Unbiased Prediction (BLUP) and confidence interval.
7. Testing for autocorrelation and fitting auto-correlated model.
8. Testing Heteroscedasticity in multiple linear regression model.
9. Recursive residuals and their applications.
10. Feasible generalised least squares estimation.
11. Multicollinearity.
12. Best subset selection based on MSE, R^2 and Mallows C_p -criterion.
13. Ridge regression.
14. Indirect Least squares(ILS)
15. Two stage least squares (2SLS) estimation.

Practicals on STS505: Time Series Analysis

1. Estimation and elimination of trend component: finite Moving Average method and Variate difference method.
2. Estimation and elimination of trend and Seasonal Component
3. Examining Stationarity. Sample ACF and PACF.
4. Identification of moving average (MA) and Auto regressive (AR) process and its order selection.
5. Yule-Walker estimation for AR(p) model.
6. Fitting MA model using Least squares regression.
7. Residual Analysis and Diagnostic checking.
8. Identification of ARIMA(p d q) process and order selection .
9. Goodness of fit of the model based on AIC and Ljung-Box criteria.

