

Hard Core	STH 503: ECONOMETRICS	No. of credits: 4
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Course Outcomes:

CO1: A broad knowledge of regression analysis relevant for analyzing economic data.

CO2: Learn estimation of model parameters, inference problems in case of simple and multiple linear regression model

CO3: estimate the model parameters of regression model when some of the basic ideal conditions are violated

CO4: regression model adapted to cross section and time-series data

CO5: Learn to select the best subsets of regressors for the model.

CO6: Learn how to use estimated regression models for prediction.

CO7: Understand the estimation techniques and inference procedure in case of simultaneous equations model

Unit I

Introduction to Econometrics. Nature of econometric study. Simple linear regression, multiple linear regression, basic assumptions. Ordinary Least Squares (OLS) estimation and their properties. Use of prior information. Restricted least squares estimators Tests of hypothesis about regression coefficients and ANOVA. Mixed regression estimator.

(13 hrs)

Unit II

Prediction – best linear unbiased predictor. Regression diagnostics and specification tests: Residual analysis for identifying influential observations, recursive residuals and their applications. Subset selection of explanatory variables, Mallows C_p -statistic. Introduction to Logistic regression model. Estimation and testing the significance of the coefficients.

(11 hrs)

Unit III

Violation of basic ideal conditions: Disturbance with non-zero mean; asymptotically unco-operative regressors. Multicollinearity – its consequences and testing. Ridge estimator and its properties. Ridge regression. Stochastic regressors, autoregressive models, Instrumental variables, Errors in variables.

(12 hrs)

Unit IV

Heteroscedasticity, tests for heteroscedasticity. Generalised Least Squares (GLS) estimators and its properties. Feasible generalized least squares estimators. Grouping of observations. Sets of Regression Equations. Auto correlation, its consequences and testing for autocorrelation. Estimation. (10 hrs)

Unit V

Simultaneous equation models. Identification problem. Identification using linear homogeneous restrictions on structural parameters, rank and order conditions.

Estimation in simultaneous equation models – Indirect Least Squares (ILS) estimators, Two State Least Squares (2SLS) and their properties. Three stage least squares estimation. (10 hrs)

References:

1. Badi H. Battagi (2002): *Econometrics*, 3rd Ed., Springer.
2. B. Abraham and Ledotter, J. (1983) *Statistical Methods for Forecasting*, John Wiley & Sons
3. Draper N.R. and Smith H. (1998): *Applied Regression Analysis*, 3rd Ed., John Wiley and Sons, Inc.
4. Dilip M. Nachane(2006): *Econometrics-Theoretical Foundations and Empirical Perspective*, Oxford University Press, New Delhi.
5. Fombay T.B., Hill R.C. and Johnson S.R. (1988) *Advanced Econometric Methods*, Springer- Verlag.
6. Greene W.H. (1993): *Econometric Analysis*, Macmillan, New York.
7. Johnston J. (1984): *Econometric Methods*, 3rd Ed., McGraw Hill.
8. Johnston J. and Dinardo J. (1997): *Econometric Methods*, 4th Ed., McGraw-Hill Companies.
9. G.S. Maddala (1977): *Econometrics*, McGraw-Hill Inc.
10. Peter Schmidt (1976): *Econometrics*, Marcel Dekker.
11. Damodar N. Gujarati (2003) "Basic Econometrics", McGraw Hill