HSS….: Introductory Econometric Techniques

Program: B.Tech (All) Year: 2022-2023 Semester: Odd
Course: Other Elective Credits: 3 Hours: 40

Course Context and Overview:
This course is an introduction to the statistical tools and econometric techniques to analyze different kinds of data in economics and related fields such as finance. The topics covered in this course will enable learners to learn robust statistical methods to establish causal-effect relationship. The course will require familiarity with calculus and linear algebra. Learners are expected to have interest in Probability and Statistics. The course will be mostly be theoretical but will focus on applied part. This course is recommended for learners planning to apply in future to business schools or graduate schools in economics or any other allied branches for post-graduate degrees. It will also likely contribute to the basic skills of students who have planned to opt for a role in business analytics and its related fields.

Prerequisites Courses: Economics for Engineers
Course outcomes (COs):

On completion of this course, the students will have the ability to:		**Bloom's Level**
CO1	Demonstrate grounding in in micro as well as macro econometrics	1,2
CO2	Understand and develop empirical strategies for applied micro and macro-economic research questions	3,4
CO3	Ability to answer economic and finance questions of interest by using econometrics technique	4,6

Course Topics

Contents	**Hours**
Unit I : Recap and Introduction	3
Discrete and Continuous Distribution, Statistical Inference, Types of Data, Economic and Econometric Models	
Unit II: Classical Linear Regression Model	6
Assumption of Classical Model, Estimation, Inference, Asymptotics, Types of linear models	
Unit III: Problems of Multicollinearity, Autocorrelation and Heteroskedasticity	6
Nature, Detection and Remedy	
Unit IV: Regression Analysis with Dummy Variable	5
Estimation and Inference With Dummy variable, Limited Probability Model, Probit and Logit Model	
Unit V: Simultaneous Equation Models	4
Endogenous and Exogenous variables, Identification problem, IV method [Examples from Finance]	
UNIT VI: Univariate Time Series Modeling	7
Econometric and Financial Econometric Models, Stationary and Weak Stationary Process, White Noise Process, Autoregressive and Moving Average Process	

UNIT VII: Multivariate Models	5
Vector Autoregressive Models, Problems with Vector Autoregressive Models, Long-run Relationship in Financial Data: Testing Unit-root, Cointegration	
UNIT VIII: Basic Models of Volatility	4
Volatility, Exponentially Weighted Moving Average Models, Autoregressive conditionally heteroscedastic models, Generalized ARCH models	

Textbook References:

Brooks, Chris. 2008. *Introductory Econometrics for Finance*. 3rd Edition, Cambridge University Press.

Enders, Walters. 2013. *Applied Econometric Time Series*. 3rd Edition, John Wiley & Sons.

Koutsoyianis, A. 2001. *Theory of Econometrics*. 2nd Edition, Palgrave.

Maddala, GS. 1992. *Introduction to Econometrics*. 3rd Edition, Macmillan Publishing Company.

Wooldridge, J. 2013. *Introductory Econometrics*: A Modern Approach. 5th Edition, South-Western Cengage Learning.

Additional Resources (NPTEL, MIT Video Lectures, Web resources etc.)

Evaluation Methods:

Item	Weightage (%)
Quiz	20
Mid Term	30
End Term	50
Total	100

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