Course Code	ECO321
Course Name	Econometrics I
Credits	4
Course Offered to	UG
Course Description	We will review working with expectation operators and matrix algebra. We will study various statistical models utlizied to test theoretical economic relationships, analyze historical economic events, and conduct economic policy evaluation. Simple and multiple regression using ordinary least squares estimation, maximum likelihood estimation, and generalized least squares estimation will be covered in detail. We will learn tools of basic statistical inference and diagnostics for these models. Time-allowing, we will study logit and probit regressions to handle discrete choices (e.g. Yes/No choice scenarios). basic time-series analyses with tests and controls for trends, seasonality, and autocorrelation.

Pre-requisites

Pre-requisite (Mandatory)	Pre-requisite (Desirable)	Pre-requisite(other)
MTH201 (Probability and Statistics)	None	None

Post Conditions

CO1	CO2	CO3	CO4	CO5
Understand how the notions of random variables, prob. distributions, moments and expectations lead to the estimation of causal ecomomic relations, test economic theory and analyze various policies	Utilize optimization methods: error minimization and likelihood maximization to estimate economic relationships using Oridnary Least Squares, Maximum Likelihood, Logit, and Probit estimators.	Abile to propose and setup regression models and infer upon proposed economic relationships using standard tests of statisitcal significance.	Ability to validate various regression models from distribution assumptions on residuals.	Ability to estimate regressions using real-world datasets on a standard statistical package.

Weekly Lecture Plan

Week Number	Lecture Topic	COs Met	Assignment/Labs/Tutorial
Week 1	Causality and Correlation.	CO1	A short project will be assigned based on a real-world dataset (individual or group project depending upon class-size). At the end of the semester, students will present their findings/contributions.
Week 2	Linear models for 'observational' economic data	CO2	
Week 3-4	Ordinary Least Square Regression, properties of the BLUE estimator, ANOVA table	CO2, CO3, CO4	
Week 5-6	Maximum Likelihood Estimation, asymptotic properties of the MLE estimator	CO3, CO4	
Week 7	Heteroskedasticity: tests for consistency of OLS and MLE estiamators.	CO4, CO5	
Week 8	Generalized Least Squares Estimators, asymptotic properties of GLS estiamator	CO3, CO4	
Week 9-10	Limited dependent variable models: discrete choices, binomial and multinomial dependent variables	CO3, CO4	
Week 11	Statistical Infrerence and Hypothesis testing for econometric data	CO4, CO5	
Week 12	Introduction to Time-Series analyses	CO3, CO4, CO5	
Week 13	Project Presentations	CO5	

Assessment Plan

Type of Evaluation	% Contribution in Grade
Quiz/Assignments	25
Project	25
Midsem	20
Endsem	30

Resource Material

Type	Title
Reference	Introductory Econometrics: A modern approach by Jeffrey M. Wooldridge (4th edition, Cengage India)
Reference	Basic Econometrics by D.N. Gujarati, The McGraw-Hill Companies, 2004
Reference	Microeconometrics: Methods and Applications by A. Colin Cameron and Pravin K. Trivedi (Cambridge, online copy of 2005 edition available)