Birla Institute of Technology & Science, Pilani
Hyderabad Campus

FIRST SEMESTER 2019-2020

Course Handout Part II

01/08/2019

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : *ECON F241*
Course Title : Econometric Methods
Instructor-in-Charge : Bheemeshwar Reddy A

Scope and Objective of the Course:

Economic theories are developed to understand real world complex economic problems. Econometrics provides the tools that are required to test abstract economic theory empirically with the help of data from real world. Recent trends in economics research point towards increasing importance of empirical analysis in understanding economic phenomena hence the knowledge of econometrics is essential for the students of economics.

The course aims to provide a basic theoretical understanding of econometric models. The course provides introduction to the classical regression model and its assumptions. The emphasis will be on theory. However, the course also provides institutive understanding of basic econometric concepts and methods. The course deals with the application of econometric methods and interpretation results from different econometric models. Further, the course provides basic hands on training in using R statistical package to enable the students to apply econometric models using data sets from Indian context. The course covers topics such as theory and assumptions underlying the classical single and multiple linear regression models, time series models and simultaneous equations.

1. **Textbooks: Christopher Dougherty** (2016) Introduction to Econometrics, 5th Edition, Oxford University Press.
1. **Reference books**
1. **R1) Jeffrey M. Wooldridge** (2013*), Introductory Econometrics: A Modern Approach*, 5th Edition, Thomson, South-Western.
2. **R2) James H. Stock and Mark W. Watson** (2014) Introduction *to Econometrics, Pearson*
3. **R3) Peter Kennedy (**2008), *A Guide to Econometrics*. Wiley-Blackwell; 6th Edition,
4. **R4) Damodar. N. Gujarati and Sangeetha** (2012), *Basic Econometrics*, 5th Edition

Tata McGraw-Hill Publishing Company Limited,

Course Plan:

Lecture No.	Learning objectives	Topics to be covered	Chapter in the Text Book
1-2	On completion of the module, students will be able to learn the scope and importance of econometrics and they will also be able to distinguish the differences among different types of economic data. Students will also revise fundamentals of probability, statistical inference, and mathematical statistics that are prerequisite for this course.	The nature and scope of econometrics & review of probability statistics: the scope of econometrics; types of data; review of fundamental concepts in probability such as probability and distribution, expectation and moments, sampling distributions and inference, the Central Limit theorem	**Review (TB) & 1 (R3) and additional readings**
3-9	Students will learn different theoretical aspects of simple linear regression model and its properties and the underlying assumptions. Students will also	**The Simple Linear Regression Model:** Simple regression model, assumptions, deriving the ordinary least square (OLS) estimates, properties of OLS, unbiasedness of OLS, variance of OLS estimators, estimating error variance, Gauss-Markov theorem, hypothesis testing	**Ch.1-2 (TB), Ch. 2-6 (R4) & Ch. 3-6 (R1) and additional readings**

	learn derivation of ordinary least squares method of estimates and they will also master concepts such as unbiasedness and consistency of least squares estimates. Students will also learn about hypothesis testing in the context of regression.		
10-19	Students will learn advantages of multiple linear regression over simple linear regression. They will also learn derivation of ordinary least squares method of estimates. Students will learn about sampling distribution of OLS estimators and hypothesis testing. They will learn how to interpret regression results. Students will learn the meaning	**Multiple Regression Analysis:** Multiple Regression Estimation, Inference & OLS asymptotics	**Ch. 3 (TB), Ch. 7-8 (R4) & Ch. 3-6 (R1) additional readings**

	and usefulness of consistency, asymptotic normality and asymptotic efficiency of OLS.		
20-21	On completion of this module, students will learn about how to deal with independent qualitative variables and learn how to interpret the dummy explanatory variables. Further, they will also learn about what is the meaning of an interaction among dummy variables and how to interpret the same.	**Dummy variables:** Use of dummy variable, slope of dummy variables, interpretation of dummy regression coefficients, interaction involving dummy independent variables	**Chapter 5 (TB) & additional readings**
22-32	On completion of the module, students will learn the meaning of multicollinearity, consequences of multicollinearity and how to detect multicollinearity	**Violation the assumption of classical linear regression model:** Multicollinearity; consequences of multicollinearity; tests for detecting the multicollinearity and solutions; prediction; heteroscedasticity and its implications; tests for detection; solutions; prediction; sources of autocorrelation, the first-order autoregressive scheme; tests;	**Ch. 7-8 (TB), Ch. 10-12 (R4) & Ch.8 (R1) and additional readings**

	with help of different indicator of multicollinearity. They will also learn about the methods to address the problem of multicollinearity. Students will also learn about violation of another assumption of CLRM, heteroscedasticity. They will learn the consequences of heteroscedasticity and how to detect heteroscedasticity with help of different tests such as Park test, Goldfeld-Quandt test etc. Students will also learn the different methods to address heteroscedasticity. Students learn the meaning of autocorrelation, consequences of autocorrelation and how to detect autocorrelation with help of	solutions for the case of autocorrelation	

	different tests of autocorrelation. They will also learn about the remedial measures to address the problem of autocorrelation.		
33-38	Students will learn about the problems arising due to misspecification of regression model. Specifically, they will learn about the consequences of omitted variable problem. Also they will learn the meaning of measurement error and its consequences.	**Model specification and Measurement Errors:** Model specification, properties of OLS under measurement error	**Ch. 6 (TB), Ch. 13 (R4) & Ch. 9 (R1) additional readings**
39-42		**Simultaneous equation models:** Simultaneous dependence of variables and consequences; simultaneous bias; the problem of identification; indirect least squares & two stage least squares	**Ch. 9 (TB), Ch. 16 (R1) & Ch.18-20 (R4) and additional readings**

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Mid-semester test	90 Minutes	35%	30/9, 9.00 -- 10.30 AM	Closed Book
Assignments/		10%	TBA	Open book

Projects/(2)				
Surprise Quizzes(2)		10%	TBA	Open book
Comprehensive Examination	180 Minutes	45%	4/12 FN	Closed Book

Chamber Consultation Hour: To be announced in class.

Notices: All notices regarding the course will be displayed on the CMS or ECOFIN Dept. notice board.

Make-up Policy: Make-up will be given only on Doctor's/Warden's recommendation and with prior permission of the Instructor-in-Charge/Instructor. Make-up application via sms/messages is not acceptable.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

INSTRUCTOR-IN-CHARGE