



Birla Institute of Technology & Science, Pilani
Hyderabad Campus

FIRST SEMESTER 2020-21
Course Handout Part II

Dated: 17/08/2020

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 : **Rishi Kumar**

1. Course Description:

This course will introduce you to fascinating world of empirical techniques. It will help you learn the theory related to various econometrics methods and their application to the real world data. The focus will be on the estimation and testing of the econometric models so that you can apply theoretical concepts to practical problems and find empirics based insights to them.

2. 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 theories empirically with the help of data from the real world. Recent trends in economics research point towards increasing importance of empirical analysis in understanding economic phenomena. Hence, knowledge of econometrics is essential for the students of economics.

The course aims to provide a basic theoretical understanding of econometric models. It provides introduction to the classical regression model and its assumptions. The emphasis will be on econometric theory. The course deals with the application of econometric methods and interpretation of results from different econometric models. Further, the course provides basic hands on training in using different statistical package to enable the students to apply econometric models by using data. The course covers topics such as theory and assumptions underlying the classical single and multiple linear regression models.

3. Text Books:

T1. Christopher Dougherty (2016) Introduction to Econometrics, 5th Edition, Oxford University Press.

T2. R. Carter Hill, William E. Griffiths and Guay C. Lim (2018) Principles of Econometrics, 5th Edition, Wiley.



Reference books:

R1. Jeffrey M. Wooldridge (2013), *Introductory Econometrics: A Modern Approach*, 5th Edition, Thomson, South-Western.

R2. James H. Stock and Mark W. Watson (2014) *Introduction to Econometrics*, Pearson

R3. Peter Kennedy (2008), *A Guide to Econometrics*. Wiley-Blackwell; 6th Edition,

R4. Damodar. N. Gujarati and Sangeetha (2012), *Basic Econometrics*, 5th Edition
Tata McGraw-Hill Publishing Company Limited,

4. Course Plan:

Lecture No.	Learning objectives	Topics to be covered	Chapter in the Text Book
1	An Introduction to Econometrics	The nature and scope of econometrics, different ways to generate data and types of economic data	T2: Ch-1
2-11	The Simple Linear Regression Model	Simple regression model estimation, assumptions, ordinary least square (OLS) estimates & their properties, Gauss-Markov theorem, interval estimation & hypothesis testing, prediction, Goodness-of-Fit and modeling issue	T2:Ch-2-4, T1:Ch.1-2, R4:Ch.2-6, R1:Ch.3-6 and additional readings
12-17	The Multiple Regression Model	Multiple regression model estimation, Inference & OLS asymptotic, interval estimation & hypothesis testing	T2: Ch-5, T1:Ch.3 , R4:Ch.7-8, R1:Ch3-6 & additional readings
18-21	Dummy variables	Use of dummy variable, interpretation of dummy regression coefficients, interaction involving dummy independent variables, log-linear models and the linear probability model (LPM)	T2: Ch-7, T1: Ch-5 & additional readings
22-32	OLS assumptions' violation; further inference in the Multiple Regression Model	Violation of OLS assumptions, multicollinearity & heteroskedasticity, testing joint hypotheses and model specification	T2: Ch-6 & Ch-8, R4: Ch10-13 & additional readings
33-40	Regression with Time-Series Data	Stationarity and weak dependence, forecasting, testing for serially correlated error and time-series regressions for policy analysis	T2: Ch-9 & additional readings
41-43	Simultaneous Equations	A supply and demand Model, the reduced-form equations,	T2: Ch-11, T1:Ch.9,



	Models	the failure of least squares estimation, the identification problem and two-stage least squares estimation	R1:Ch-16 & additional readings
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5. Learning Outcomes:

Topic 1: An Introduction to Econometrics

In this topic students will be introduced to the subject and given an overview of the course. On completion of the module, students will be able to appreciate the scope and importance of econometrics.

Topic 2: The Simple Linear Regression Model

In this part of the course, the students will start with learning the basics of simple linear regression model, its properties and the underlying assumptions. Students will also learn ordinary least squares method of estimates and their properties. Students will also be introduced to the concepts of interval estimation, hypothesis testing, goodness-of-fit and modeling issues in the context of simple linear regression model.

Topic 3: The Multiple Regression Model

Multiple regression model will be introduced to the students in this section. They will also learn about estimation & inference of the multiple regression model. Interval estimation & hypothesis testing in the context of multiple regression model will also be discussed.

Topic 4: Dummy variables

In this module, students will learn to deal with independent qualitative variables and interpretation of the dummy explanatory variables. We will also cover the concept of interaction among dummy variables and their interpretation. Students will also learn about two additional types of models viz log-linear models and the linear probability model (LPM).

Topic 5: Classical linear model assumptions violation and further inference in the Multiple Regression Model

On completion of the module, students will learn the meaning of multicollinearity and heteroscedasticity, their consequences, tests for detection and remedial solutions. Students will also be made aware about violation of another assumptions of CLRM. We will also cover the problems arising due to misspecification of regression model including omitted variable problem. The concepts related to measurement error and its consequences and testing joint hypotheses by using the F-test will be studied.

Topic 6: Regression with Time-Series Data

In this part of the course, the students will learn the basics of univariate time series including concepts of stationarity and non-stationarity, and forecasting. Students will also learn about autocorrelation & various tests for serially correlated errors. They will also be introduced to the regression models used while working with time series data.

Topic 7: Simultaneous Equations Models



In the concluding part of this course, the students will be introduced to the concepts of simultaneous equation models and instrumental variables estimation.

6. Evaluation Scheme:

S.No.	Components	Duration	Weight age (%)	Date, Time & Venue	Nature of Component
1	Test-I	30 min	15	September 10 – September 20 (During scheduled class hour)	OB
2	Test-II	30 min	15	October 09 –October 20 (During scheduled class hour)	OB
3	Test-III	30 min	15	November 10 – November 20 (During scheduled class hour)	OB
4	Assignment-I	-	10	To be announced	OB
5	Assignment-II	-	10	To be announced	OB
6	Comprehensive Exam.	2 hrs.	35	As announced in the Timetable	OB

7. Chamber consultation hour: To be announced in the class.

8. Notices: All notices regarding the course will be put on CMS or the **Economics and Finance or LTC Notice Boards**.

9. Make-up Policy: Make-up will be granted only on genuine grounds and if prior permission is taken through official email only. Request for make up after the test/exam would not be entertained at all.

10.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
ECON F241

