ECON 7109	**Econometrics Lab**	L	T	P	C
Version 1.0		1	0	1	2
Pre-requisites/Exposure	Graduation + Bridge Course in Economics + Knowledge of Econometrics				
Co-requisites	Knowledge of Excel				

Course Objectives

The objectives of this course are:

(a) To familiarize students with various database.

b) To familiarize students with various econometric software.

c) To familiarize students of how to enter data, estimate model, generate results, and interpret results.

Course Outcomes

Upon successful completion of the course a student will be able to:

CO1: To be able to demonstrate how to enter data in econometric software;

CO2: To be able to estimate econometrics models using various command of econometric software;

CO3: To be able to analyses and draw inference from the results.

CO4: To demonstrate ability to successfully use computer package such as STATA, Eviews, Excel, etc.

Lab Content

Module 1: **Introduction to Econometrics:** **(4 hours)**

- Nature and Sources of Data

Module 2: **Simple Linear Regression Model: Two Variable Case:** **(4 hours)**

- Estimation and Hypothesis Testing, and Interpretation

Module 3: **Multiple Linear Regression Model: Two Variable Case:** **(4 hours)**

Estimation and Hypothesis Testing, and Interpretation

Module 4: **Violation of Classical Assumption: Consequences, Detection, and Remedies** **(4 hours)**

- Multicollinearity
- Heteroscedasticity
- Autocorrelation

Module 5: **Dummy Variable Regression Models** **(4 hours)**

- Regression models with all dummy explanatory variables, with mixture of quantitative and qualitative regressors, interaction effect
- Dummy variable in seasonal analysis; piecewise linear regression
- Qualitative response regression models-LPM, Logit, Probit, Multinomial logit

Module 6:

Time Series Analysis **(4 hours)**

- Tests of Stationarity-Graphical Analysis, Autocorrelation Function and Correlogram; The Unit Root Test
- Transforming Non-stationary time series; Cointegration; D-W Test, ECM
- Unit Root and Cointrgration
- AR, MA, ARMA, ARIMA
- BJ Methodology and Forecasting energy demand and supply
- Modelling Energy consumption using VAR and VECM

Text Books

Gujarati, D. N. (2004). Basic Econometrics. Tata McGraw-Hill.

Gujarati, D. N. (2006). Essentials of Econometrics. Tata McGraw-Hill

Salvatore, D. and Reagle, B. (2002). Statistics and Econometrics. Schaum Outline Series

Modes of Evaluation: Quiz/Assignment/ presentation/ demonstration/ Result Interpretation:

Components	Lab Test	Assignment	Project Report	Presentation	ESE

Weightage (%)	**10**	**10**	**20**	**10**	**50**

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	**Mapped Programme Outcomes**
CO1	To be able to demonstrate how to enter data in econometric software;	PO 1,2, 3,4,7,8,9,10, 11,13, 14
CO2	To be able to estimate econometrics models using various command of econometric software;	PO 1,2, 3, 5,7,8,9,10, 11, 12, 14
CO3	To be able to analyses and draw inference from the results.	PO 1,2, 3,6 8,9,10, 11, 13,14

Program Outcome / Course Outcome mapping

CO	**CO 1**	**CO 2**	**CO 3**
PO 1	3	3	3
PO 2	3	3	3
PO 3	3	3	3
PO 4	3		
PO 5		2	
PO 6			2
PO 7	3	3	
PO 8	3	3	3
PSO 9	3	3	3
PSO 10	3	3	3
PSO 11	3	3	3
PSO 12		2	
PSO 13	3		3
PSO 14	3	3	3

Course Code	ECON 7109
Course Title	Econometrics Lab

Students will be able to develop and evaluate alternate managerial choices and identify optimal solutions.	**PO 1**	3
Students will demonstrate effective application capabilities of their theoretical understanding of economics theories – Microeconomics, Macroeconomics and trade theories to the renewable and non-renewable energy sectors	**PO 2**	3
Students will exhibit effective decision-making skills, employing analytical and critical thinking ability.	**PO 3**	3
Students will demonstrate effective oral and written communication skills in presenting frameworks, models and regulations of the energy sector	**PO 4**	1
Students will be able to work effectively in teams and demonstrate team-working capabilities.	**PO 5**	1
Students will exhibit leadership and networking skills.	**PO 6**	1
Students will demonstrate sensitivity towards ethical and moral issues and have ability to address them in energy economics.	**PO 7**	2
Students will demonstrate employability traits in line with the needs of changing dynamics of renewable and non-renewable energy sectors	**PO 8**	3
Students will demonstrate strong conceptual knowledge of economic theory in the context of renewable and non-renewable energy sectors.	**PSO 9**	3
Students will demonstrate effective understanding of economics as it is applicable to energy markets, energy pricing, energy trading and risk management	**PSO 10**	3
Students will demonstrate analytical skills in designing solutions for energy efficiency.	**PSO 11**	3
Students will exhibit the ability to evaluate working of energy policies.	**PSO 12**	1
Students will have domestic and global perspective towards legal frameworks and environmental regulations with respect to energy sectors.	**PSO 13**	2
Students will exhibit deployable skills pertinent to the renewable and non-renewable energy sectors.	**PSO 14**	3

1 – Weakly mapped
2 – Moderately mapped
3 – Strongly mapped

Model Question Paper

Name: **Enrolment No:**	UPES

End Semester Examination-May 2017

Program/course	**: MA Economics (EE)**	**Semester**	**: II**
Subject	**: Econometric Lab**	**Max. Marks**	**: 100**
Code	**: ECON 7109**	**Duration**	**: 3 Hrs**

Section A
(Attempt all)

Q1. Estimate energy consumption function using GDP as explanatory variable for the period from 1970 to 2017 and interpret the following.

i.	Intercept	**[4]**	**CO1**
ii.	Slope coefficient	**[4]**	**CO1**
iii.	R-square	**[4]**	**CO1**
iv.	t-values	**[4]**	**CO1**
v.	F-value	**[4]**	**CO1**
	SECTION B **Answer the questions** 10 X2= 20		
Q2.	Estimate Crude Oil import function using GDP and FDI of India for the time period from 1970 to 2017 and generate VIF and TOL.	**[10]**	**CO3, CO2**
Q3.	Test stationarity of Crude Oil import, GDP and FDI of India for the time period from 1970 to 2017.	**[10]**	**CO3, CO2**
	SECTION C **Answer the questions** 2 X 15 = 30		
Q4.	Estimate Carbon Emission (co2) using factors such as oil consumption, per capita GDP, import of goods and services, and export of goods and services for the time period from 1970 to 2017 for India. Using the regression result do individual hypothesis testing.	**[15]**	**CO2, CO1**
Q5.	Estimate Carbon Emission (co2) using factors such as oil consumption, per capita	**[15]**	**CO2, CO3**

	GDP, import of goods and services, and export of goods and services for the time period from 1970 to 2017 for India. Perform the following test of heteroscedasticity for the regression model. i. Graphical Method		
	SECTION D **Answer the questions** 2 X 15 = 30		
Q4.	Estimate Carbon Emission (co2) using factors such as oil consumption, per capita GDP, import of goods and services, and export of goods and services for the time period from 1980 to 2017 for India. Using the regression result do joint hypothesis testing.	**[15]**	**CO3**
Q5.	Estimate Carbon Emission (co2) using factors such as oil consumption, per capita GDP, import of goods and services, and export of goods and services for the time period from 1980 to 2017 for India. Perform the following test of heteroscedasticity for the regression model. i. Breusch-Pagan/ Cook-Weisberg test	**[15]**	**CO3**