JAIPURIA INSTITUTE OF MANAGEMENT, NOIDA
PGDM (SM) 2017-19; TRIMESTER V; ACADEMIC YEAR 2018-19

Course Code and title	OM 504: Business Forecasting
Credits	3
Term and Year	V Term, 2018 -19
Course Pre-requisite(s)	As applicable
Course Requirement(s)	Basic concepts of Statistics
Course Schedule (day and time of class)	Time Table Slot here
Classroom # (Location)	As informed by program office
Course Instructor	Dr. Surender Kumar
Course Instructor Email	surender.kumar@jaipuria.ac.in
Course Instructor Phone (Office)	0120-4638330
Student Consultation Hours	Monday, 2-4 pm
Office location	CS-03 (IInd Floor)

1. Course Overview

Business forecasting leads to effective management by increasing accuracy and reducing bias in forecasting process. Effective management, requires an understanding of the realities, limitations, and principles fundamental to the process. Lack of basic concepts like randomness, variation, uncertainty, and forecastability, the organization is apt to squander time and resources on expensive and unsuccessful fixes. This course aims to provide an introduction to the practice of forecasting in business. Forecasting requires both practical experience in model building and some statistical theory. To blend the theory and practice, many business forecasting examples are discussed. Excel/ Eviews is used to do useful preliminary calculations and plotting. At the end of this course, students should be able to understand the major techniques of forecasting and be able to intelligently forecast actual business time series using Excel and its extensions.

2. Course Learning Outcomes (CLO)

At the end of the course, the students should be able to:
LO1: Create precise outcome of classical linear regression model (K)
LO2: Investigate the assumptions of classical linear regression model (K)
LO3: Examining the violation of assumptions of classical linear regression model (K&S)
LO4: Estimate parameter using time series analysis for financial/economic data (K)
LO5: Appraise outcomes of the times series analysis for financial/economic data (K&S)
LO6: Apply spread sheet/E-views/R for time series data analysis (S)

3. Mapping of CLOs with PLO and GAs

	PLO 1 Communicate effectively and display inter-personnel skills	**PLO 2** Demonstrate Leadership and Teamwork towards achievement of organizational goals	**PLO 3** Apply relevant conceptual frameworks for effective decision-making	**PLO 4** Develop an entrepreneurial mindset for optimal business solutions	**PLO 5** Evaluate the relationship between business environment and organizations	**PLO 6** Appreciate sustainable and ethical business practices	**PLO 7** Leverage technologies for business decision	**PLO 8** Demonstrate capability as an Independent learner
CLO1	X		X					
CLO2			X					
CLO3	X		X					X
CLO4			X					
CLO5			X					X
CLO6							X	X

	GA 1 Self initiative	**GA 2** Deep discipline knowledge	**GA 3** Critical thinking and problem solving	**GA 4** Humility, team work and leadership skills	**GA 5** Open and clear communication	**GA 6** Global outlook	**GA 7** Ethical competency and sustainable mindset	**GA 8** Entrepreneurial and innovative
CLO 1		**X**			**X**			
CLO 2		**X**	**X**					
CLO 3	**X**	**X**	**X**	**X**			**X**	
CLO 4		**X**						
CLO 5	**X**	**X**	**X**	**X**			**X**	
CLO6	**X**		**X**	**X**				

4. Prescribed VED framework

Module	**Vital**	**Essential**	**Desirable**

	(prerequisite or basic knowledge or skills)	**(Non-imperative yet significant)**	**(adds substance, breadth, or interest to a subject or skill)**
Module 1: The Nature and Sources of Data for Economic Analysis	Types of data and variables, levels of measurements	Introduction to classical regression model, estimation of two variables regression model, Interpretation of regression model	Application of two variable regression for different sectors
Module 2: Assumptions and Diagnostic of Classical Normal Liner Regression Model	Classical Normal Linear Regression Model, estimation of multiple regression model, Problems of Multicollinearity, heretoscedasticity and autocorrelation and diagnostic procedure	Interpretation of multiple regression and developing diagnostic procedure	Forecasting with multiple regression for different sectors
Module 3: Panel Data Analysis.	Basics of panel data	Use of technique and Interpretation of panel data result	Forecasting with pooled, fixed effect and random effect models for different business situation
Module 4: AR, MA, and ARIMA , VAR Modeling of Time Series Data	Nature of time series data, need of time series analysis for financial/economic data	Defining time series analysis, concept of stationarity, ARMA, VAR models, testing for causality	Forecasting with ARIMA and VAR in different financial markets/economic data
Module 5: Volatility in Financial Time Series	Understanding of variability over time	Defining, concept of ARCH and GARCH models.	Forecasting with ARCH and GARCH models in different financial markets/economic data

	Pre-class
	In-class
	Beyond class

5. Text Book

Text Book

D. Gujarati and D. Porter, Basic Econometrics, 5th edition, McGraw-Hill, 2009.

References

J.M. Wooldridge, Introductory Econometrics, 5th edition, 2013, South-Western.

J.H. Stock and M.W. Watson, Introduction to Econometrics, 2nd edition, 2007, Pearson Education: Addison Wesley.

W.H. Greene, Econometric Analysis. 6th edition. 2008, Prentice-Hall.

William E. Griffiths, R. Carter Hill, Guay C. Lim, Using EViews for Principles of Econometrics, 4th edition, 2012, Wiley

H. Studenmund, Using Econometrics, A Practical Guide, 6th edition, Addison-Wesley.

6. Assessment Tasks (sample and indicative)

Assessment Item	Description	Weightage	CLO
Quizzes	Three quizzes (one on each module 1, 2, 3)	10%	CLO 1, 4
Assignments	Two Assignments; First on module 2 and 3 where students will be asked to analyze the given cross-sectional data using Spread Sheet/E-Views/R by applying the knowledge and skills gained during the module. Second on Module 5 where students will be asked to analyze the given time series data using Spread	20%	CLO 2,3,5,6

	Sheet/E-Views/R by applying the knowledge and skills gained during the module.		
Project work	It will be a group work. The students will be asked to conceptualize the research problem and use the analysis of economics/financial data for solving the research problem.	20%	CLO 1,2,3,4,6
Class participation	It will be based on how students actively participate in class to get good learning experience.	10%	
End Term Examination	It will be based on entire syllabus and will be executed in computer lab. The question paper will be designed in such a way so as to evaluate students on three parameters: Knowledge; Application and Skills.	40%	CLO2,3,5,6

All assessment items to have a description, weightage, and must be mapped on to the relevant CLOs.

7. Session Plan

Session	Topic	Requirements: Readings/Cases	Session Learning Outcome	CLO
Module I: The Nature and Sources of Data for Economic Analysis				
1	Relevance and importance of econometrics	Handout	Need and basic principles of econometrics analysis	1
2	Nature of regression analysis and concept of two variables regression	Chapter 1 (Page 15-37) and Chapter 2 (Page 38-60)	Understanding regression analysis and how it is different from causation and correlation.	1
3	Estimation problems of two variables regression model	Chapter 3 (Page 61-104)	The assumptions and properties of ordinary least square (OLS) estimators, concept of goodness of fit etc.	1
4	Hands on training session on two variables regression using Ms-Excel	Practice session in Computer Lab	Estimation of two variables regression using Ms-Excel	1, 6
Module II: Assumptions and Diagnostic of Classical Normal Liner Regression Model				
5	Introduction to Classical Normal Linear Regression Model	Chapter 4 (Page 105-114)	Understanding the probability distribution and normality assumption of error term, properties of OLS under normality assumption	2
6	Concept and Estimation problems of Multiple Regression Model	Chapter 7 (Page 203-248)	Understand the estimation procedure of multiple regression model	2
7	Inference problems of Multiple Regression Model	Chapter 8 (Page 249-294)	Understanding the inference related problems while testing the multiple regression model	2

8	Hands on training session on multiple regression model using Ms-Excel	Practice session in Computer Lab	Estimation of two variables regression using Ms-Excel	2, 6
Module III: Panel Data Analysis.				
9	Panel Data:	Chapter 16 (Page 592-593)	Recognition of panel data	3, 4
10	Pooled OLS Regression or Constant Coefficients Model	Chapter 16 (Page 594)	Develop and analyses Pooled OLS model	3, 4
11	The Fixed Effect Model	Chapter 16 (Page 596)	Develop and analyses Fixed Effect model	3, 4
12	Random Effects Model	Chapter 16 (Page 602)	Develop and analyses Random Effect model	3, 4
Module IV: AR, MA, ARMA and VAR Modeling of Time Series Data				
13	Need and basic concepts of ARMA	Chapter 21 (Page 780-821)	Understand the time series analysis and concept of stationarity	3, 4
14	Testing the stationarity	Chapter 21 (Page 780-821)	Testing of stationarity using financial time series data	4
15	ARMA Models	Chapter 21 (Page 780-821)	Understanding ARMA modeling	4
16	Hands on training session on testing the Stationarity and ARMA models	Practice session in Computer Lab	Hands on practice on ARMA models using Ms-Excel	4, 6
17	Testing for causality using VAR	Handout	Testing of causality between multiple time series variables	5
18	Testing for causality using VECM	Handout	Testing of causality between multiple time series variables	5
19	Testing for causality	Handout	Testing of causality	5

	using ARDL		between multiple time series variables	
Module 5: Volatility in Financial Time Series				
20	Introduction to autoregressive conditional heteroscedasticity	*NSE/BSE. Exchange Rate: An Example(Chapter 22, Page 797)*	Visualization of autoregressive conditional heteroscedasticity	5
21	Durbin–Watson d and the ARCH Effect	*ARCH Model of the U.S. Inflation Rate: January 1947 to March 2008 (Chapter 22, Page 797)*	Apply ARCH Model	5,6
22	GARCH Effect	Handout	Apply GARCH Model	5,6
23	Project Presentation			1,2,3,4,6
24	Project Presentation			1,2,3,4,6

Time budgeting in course planning:

Please note that while assigning activities and planning teaching schedules following table may be of help. The weightage of items in the table is prescriptive and may vary according to course requirement. Yet it is indicative of how student time per course can be budgeted:

Activity	Description	Time Budgeted
Classes	2-3 hours per week for 12 weeks	30 hours
Reading	Prescribed readings and making notes	10 hours
Preparation of assignments	Including shared and group exercises	20 hours
Preparation of project work	Reading and writing	20 hours
Study and revision for test and end of Trimester examination	Self-preparations	20 hours
TOTAL		100 hours

RUBRICS FOR ASSESSMENT COMPONENT

RUBRICS FOR QUIZ (10 Marks)

POOR	FAIR	GOOD	EXCELLENT

Marks 0-3	Marks 4-5	Marks 6-8	Marks 9 – 10
ONLY UP TO 30% ANSWERS ARE CORRECT	**BETWEEN 40 – 50% (both inclusive) ANSWERS ARE CORRECT**	**BETWEEN 60 – 80% (both inclusive) ANSWERS ARE CORRECT**	**MORE THAN 80% ANSWERS ARE CORRECT**
UNSATISFACTORY	**MINIMAL**	**PROFICIENT**	**EXEMPLARY**
A very few of the concepts are clear and student is unable to understand the same.	Some of the concepts are clear and understood by student.	Majority of concepts are clear and understood by student.	Most of concepts are clear and understood by the student.

where students will be asked to analyze the given cross-sectional data using Spread Sheet/E-Views/R by applying the knowledge and skills gained during the module.

RUBRICS FOR ASSIGNMENT

CRITERIA	**Inadequate**	**Adequate**	**Advanced**
	POINTS 0-30%	**POINTS 30%-70%**	**POINTS Above 70%**
Defining the econometrics problem clearly (Marks: 2.5)	Not able to define the econometrics problem properly	Somewhat able to define the econometrics problem	Defined econometrics problem correctly
Estimation of regression equation (Marks: 2.5)	Not able to test correctly	Somewhat able to test	Able to test correctly
Suggesting the diagnostic procedure for assumptions of regression analysis (Marks: 2.5)	Not able to suggest diagnostic procedure for assumptions	Somewhat able to suggest diagnostic procedure for assumptions	Able to suggest proper diagnostic procedure for assumptions
Interpretation of	Not able to interpret the regression	Somewhat able to	Able to interpret the

regression output (Marks: 2.5)	output	interpret the regression output	regression output clearly.

RUBRICS FOR PROJECT

CRITERIA	**Inadequate**	**Adequate**	**Advanced**
	POINTS 0-30%	**POINTS 30%-70%**	**POINTS Above 70%**
Defining the research problem correctly (Marks: 5)	Not able to define the research problem	Somewhat able to define the research problem	Able to define research problem correctly
Usage of Appropriate data (Marks: 5)	Not able to use appropriate data for analysis	Somewhat able to use appropriate data for analysis	Able to use appropriate data for analysis
Analysis of econometric models (Marks: 5)	Not able to analyze econometric model	Somewhat able to analyze econometric model	Able to analyze econometric model
Preparation of Results and Presentation of Report (Marks: 5)	Not able to prepare and present the results clearly	Somewhat able to prepare and present the results clearly	Able to prepare and present the results clearly

RUBRICS FOR END TERM (40 Marks)

POOR	**FAIR**	**AVERAGE**	**GOOD**	**EXCELLENT**
Marks less than or equal to 6	**Marks greater than 6 and less**	**Marks greater than**	**Marks greater than**	**Marks greater than 30 and**

	than or equal to 12	12 and less than or equal to 20	20 and less than or equal to 30	less than or equal to 40
ONLY UP TO 15% ANSWERS ARE CORRECT	**ONLY UP TO 30% ANSWERS ARE CORRECT**	**ONLY UP TO 50% ANSWERS ARE CORRECT**	**ONLY UP TO 75% ANSWERS ARE CORRECT**	**MORE THAN 75 % ANSWERS ARE CORRECT.**
Most of the concepts are not clear and student is unable to understand the same.	A few of the concepts are clear and understood by student.	Many of the concepts are clear and understood by student.	Majority of concepts are clear and understood by student.	Most of concepts are clear and understood by the student.

Institute's Policy Statements

The student is required to have a clear comprehension of the specific details included in this document. This course requires a significant commitment in and outside classroom. The learning tasks in this course include class discussions, exercises & problems and self-study. In addition, students are required to complete the various assignments/projects.

LMS-Moodle/Impartus

LMS-Moodle/Impartus is used to host course resources for all courses. Students can download lecture, additional reading materials, and tutorial notes to support class participation.

Late Submission

Assessment tasks submitted after the due date, without prior approval/arrangement, will be not be accepted. Requests for extension of time must be made with the faculty member concerned and based on Special Consideration guidelines.

Plagiarism

Plagiarism is looked at as the presentation of the expressed thought or work of another person as though it is one's own without properly acknowledging that person.

Cases of plagiarism will be dealt with according to Plagiarism Policy of the institute. It is advisable that students should read Section …. Of Student Handbook for detailed guidelines. It is also advisable that students must not allow other students to copy their work and must take care to safeguard against this happening. In cases of copying, normally all students involved will be penalized equally; an exception can be made if a student can demonstrate the work as their own and reasonable care was exercised to safeguard against copying.