INTERNATIONAL MANAGEMENT INSTITUTE, BHUBANESWAR
POST GRADUATE DIPLOMA IN MANAGEMENT (PGDM-WE)
BUSINESS FORECASTING
CREDIT: FULL (3 CREDITS)
SESSION DURATION: 90 MINUTES

TERM: V
YEAR: 2015-2016
BATCH: II

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Course Introduction:

The ever prevalent uncertainty makes it imperative for business organizations to plan their future. However, planning has to be more on the basis of objective information rather than subjective judgement. Business Forecasting as a course introduces the participant to various tools and techniques that enable a more informed prediction of the future. The output of this exercise is the genesis for planning.

Objectives:

The objectives of the course are to:

- Acquaint the participants with various techniques of business forecasting for both new products as well as established products.
- Explore data patterns and choose an appropriate forecasting technique.
- Evaluate the accuracy of both ex-antie and ex-post forecast.
- Acquaint them with qualitative methods of forecasting.

The forecasting techniques for both intermediate and final goods will also be discussed. The participants will have the opportunity to work on various computer software packages for the forecasting exercises.

Learning Outcomes:

After going through this course the students should be able to

- Distinguish between prediction and forecast and have understanding of various types of forecast.
- Differentiate between survey methods and statistical methods of forecasting.
- Identify the right type of data for forecasting.
- Evaluate the accuracy of both ex-antie and ex-post forecast.
- Analyze the data patron and choose an appropriate technique of forecasting.
- Make forecast for new and established products including intermediate products.

Pedagogy:

The course will use –

- Lectures / Discussions on issues and techniques.
- Case discussions covering a cross-section of situations depicting issues and evaluating forecasts.
- Project work.

Course Readings:

Text book:

- Hanke, John E. and Wichern, Dean, W. (2013). *Business Forecasting*. PHI Learning, (Ninth Edition).

Reference books:

- Spyros Makridakis, Steven C. Wheelwright and Rob J. Hyndman, "Forecasting Methods and Applications", John Wiley & Sons, Inc., New York, (Third Edition).
- Neil Seitz, "Business Forecasting Concepts and Microcomputer Applications", Reston Publishing Company, Inc., A Prentice-Hall Company, Reston, Virginia.
- Damodar N. Gujarati & Sangeetha, "Basic Econometrics", Tata McGraw-Hill Publishing Company Limited, New Delhi (Fourth Edition)

Course Evaluation criteria:

Class participation (Including Case preparation, discussion & presentation)	20%
Quiz	20%
Project	20%
End-term	40%
Total	**100%**

Session Plan

Session #	Topic	Reading
1 – 2	**INTRODUCTION TO THE COURSE** ☞ Why Forecast? Prediction vs. Forecast ☞ Types of Forecast – Ex-antie vs. Ex-post, Active vs. Passive, Short-run vs. Long-run ☞ Steps in Forecasting Exercise ☞ An Overview of Forecasting Techniques ☞ Managing the Forecasting Process, Computer Software Packages for Forecasting **REVIEW OF BASIC STATISTICAL CONCEPTS AND TEST FOR FORECASTING ACCURACY** ☞ Probability Distribution & Sampling Distribution, Influence from a Sample, Correlation Analysis – Scatter Diagram & Correlation Coefficient, Fitting a Straight Line. ☞ MAD, MSC, MAPE, MPE, Theil's U Inequality Coefficient & Janus Quotient Coefficient	Read : Chapter 1 Chapter 2 Chapter 3 (p. 81-84)

Session #	Topic	Reading
3-4	**EXPLORING DATA PATTERNS AND THE CHOICE OF A FORECASTIANG TECHNIQUES** ☞ Are the Data Random? Do the Data have a Trend? Are the Data Seasonal? ☞ Forecasting Techniques for Stationary Data ☞ Forecasting Techniques for Data with a Trend ☞ Forecasting Techniques for Data with Seasonality ☞ Forecasting Techniques for Cyclical Series ☞ Other Factors to Choose when Choosing a Forecasting Technique	Read : Chapter 3 Example & Cases 1. Example 1.1 (p.8) 2. Murphy Brothers Furniture (p. 94-96) 3. Alomega Food Stores (p. 99)
5-8	**NAÏVE MODELS, SIMPLA AVERAGE, MOVING AVERAGES AND SMOOTHING METHODS OF FORECASTING** ☞ Naïve Models, Forecasting Methods based on averaging – Simple averages and Moving averages ☞ Exponentially Smoothing Methods – Exponentially Smoothing Adjusted for Trend: Holts Method, Exponentially Smoothing Adjusted for Trend and Seasonal Variation: Winters Method	Read : Chapter 4 Cases : 1. The Solar Alternative Company (p. 145-146) 2. Five-Year Revenue Projection for Downtown Radiology (p. 149-154)
9-10	**FORECASTING USING TIME SERIES ANALYSIS AND THEIR COMPONENTS** ☞ Decomposition, Trend – Linear & Non-linear, Forecasting Trend ☞ Seasonality, Seasonally Adjusted Data, Cyclical and Irregular Variation, Forecasting a Seasonal Time Series	EXERCISES Read : Chapter 5 Case : The Small Engine Doctor (p. 201-202)
11-14	**USE OF SIMPLE LINEAR REGRESSION IN FORECASTING** ☞ Regression Line, Standard Error of Estimate, Decomposition of Variance, Hypothesis Testing, Analysis of Residuals, Variable Transformation and Application to Management	Read : Chapter 6 Cases : 1. Tiger Transport (p. 266-267) 2. Butcher Products, Inc. (p. 268-269)
	USING MULTIPLE REGRESSION ANALYSIS FOR FORECASTING ☞ Estimation of Model, Inference for Multiple Regression Models – Standard Error of Estimate, Significance of Regression, Individual Predictor Variable, Forecast of a Future Response, Dummy Variables, Problem of Multicollinearity ☞ Selecting the Best Regression – All possible regressions and step-wise regression, Analysis of Residuals ☞ Tests for Stability of Regression Coefficient	Read : Chapter 7 Cases : 1. The Bond Market (p. 324-327) 2. AAA Washington (p. 328-330)
15-16	**USING REGRESSION WITH TIME SERIES DATA FOR FORECASTING** ☞ The Problem of Autocorrelation, Durbin-Watson Statistics ☞ Using Regression to Forecast Seasonal Data, Regression with Differences, Econometric Forecasting, Application to Management	Read : Chapter 8 Cases : 1. Business Activity Index for Spokane County (p. 379-383) 2. Alomega Food Stores (p. 392-393)

Session #	Topic	Reading
17-18	**THE BOX-JEAKINS (ARIMA) METHODOLOGY** ☞ Autoregressive Models, Moving Average Model, Autoregressive Moving Average Model, Steps in Model Building – Model Identification, Estimation, Checking & Forecasting with Models	Read : Chapter 9 Case : 1. Restaurant Sales (p. 457-459)
19-20	**COURSE REVIEW AND PROJECT PRESENTATION**	

A NOTE ON PROJECT

You have freedom to choose your own topic as long as it is related to a forecasting problem. This forecasting problem can be an event change study, a time series study, or a characteristics-based study. You must use real data. This data can be gathered from public or private sources. You must reserve 5 to 10 per cent of your data for out of sample predictions. You may not use this data when fitting your model. Once you have settled on perhaps several models, you are then to forecast the out of sample data, as well as period (or phenomena) beyond your data. You are then to write up your results, evaluating how you did in forecasting your reserved data and how you expect to do with your future forecasts. You must not alter your models once you have simulated them over the reserved data. I will not penalize you for bad out of sample predictions as long as you intelligently evaluate why they occurred and you indicate how you might have gone about fixing your model once these new data were revealed (you can actually revise your model if you find it a compelling exercise – but you must report your initial models and results first).

As far as content is concerned, you should in the beginning of the project lay out the issue or topic you are discussing. This should include a statement of the forecasting problem or topic, any analytical or numerical frameworks you wish to use, and a brief statement of the forecasting methods you have chosen to explore. You should then present your analysis. Finally, you should give a brief summary of your models, and their out of sample predictions, and an evaluation of the reliability of your model. Suggestions for actions based on your forecasts should also be made at this point.

Sample topics might include:

1. A model that predicts the sales of a company's product line.
2. A model of movements in macroeconomic variables.
3. A model of a firm's choice of strategies (e.g., capacity utilization, price, output, quality, advertising, etc.).
4. A model of seasonality, cycles and trend in macroeconomic or company data.
5. Inventory modeling and production scheduling problems.

All data sources must be clearly detailed.