



INSTRUCTION DIVISION
FIRST SEMESTER 2015-16
Course Handout Part II

Date: 03/08/2015

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

Course No. : MBA C413
Course Title : QUANTITATIVE METHODS
Instructor-in-charge : UDAYAN CHANDA

1. Scope & Objective:

This course combines both operations research (OR) and statistical techniques that are essential for business managers. This course provides a comprehensive coverage of most important and useful tools and techniques of OR and Business Statistics.

The objectives of the course are:

- a) To provide an understanding of various tools and techniques of OR and Business Statistics
- b) To develop
 - An integrated view of various tools and techniques of analysis and optimization
 - Clarity on how to apply analytical techniques in different situations

The course will help students to equip themselves with the basic skills necessary to formulate problems, analyse data, make inferences, to apply quantitative techniques and ultimately optimize. The course provides knowledge necessary to successfully manage quantitative aspects of management. The learning from the course would depend on the extent of investment of quality time and effort by each participant in preparing for each session, reading the assigned readings, and integrating them into solution and analysis before respective sessions.

3. Text book:

- T1. Quantitative Analysis for Management, Render, Stair and Hanna, 11th Edition, Pearson Education, 2011
- T2. Statistics for Business and Economics, Anderson, Sweeney and Williams, 11th Edition, Cengage Learning, 2011

4. Reference books:

- R1. Introduction to Management Science, Hillier and Hillier, 3rd Edition, Tata McGraw Hill, 2011.
- R2. Decision Making Using MS Excel, Albright, Winston and Zappe, Cengage Learning, 2010
- R3. Managerial Decision Modeling with Spreadsheets, Balakrishnan, Render and Stair, Pearson, 2015.
- R4. Quantitative Methods for Decision Making using Excel, Davis and Pacer, Oxford University Press, 2014.



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5. Course Plan:

Lecture No.	Learning Objectives	Topics to be covered	Reference (Chapter number)
1	Introduction & Overview	Course outline and details, Evolution of Operations Research, Role of QM in today's business environment	Class notes
2-4	Organizing and Visualizing Data	Data Collection, Organizing Data, Visualizing Data: Bar Chart, Pie Chart, Pareto Chart, Stem-and-Leaf Display, Histogram, Ogive, Scatter Plot, Time Series Plot,	T1, Class notes
5-8	Numerical Descriptive Measures	Central Tendency, Variation and Shape, Exploring Descriptive Statistics: Quartiles, The interquartile range, The Boxplot; Covariance and Coefficient of Correlation	T1, Class notes
9-12	Basic Probability	Basic Probability Concepts: Events and Sample Spaces, Venn Diagrams, Simple Probability, Joint Probability, Marginal probability, Addition Rule; Conditional Probability: Computing Conditional Probabilities, Decision trees, Independence, Multiplication Rules; Bayes' Theorem	T1, Class notes
13-16	Discrete Probability Distributions	The probability Distribution for a Discrete Random Variable, Expected value of a Discrete Random Variable, Variance and Standard Deviation of a Discrete Random Variable, Covariance and its real life application, Binomial Distribution, Poisson Distribution	T1, Class notes
17-20	Continuous Distributions	Continuous Probability Distributions, The Normal Distributions: Computing Normal probabilities, Visual Exploration of Normal Distribution: Evaluating Normality, Constructing the Normal Probability Plot	T1, Class notes
21-22	Sampling Distributions	Sampling from Normally Distributed Populations, Sampling from Non-Normally Distributed Populations- The Central Limit Theorem; Sampling Distribution of the Proportion	T2, R4, Class notes
23-25	Confidence Interval Estimation	Confidence Interval Estimate for the	T2, R4, Class notes





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		Mean (σ Known); Confidence Interval Estimate for the Mean (σ unknown); Student's t Distribution, Properties t Distribution, The concept of degrees of freedom, Confidence Interval Estimates, Determination of Sample Size	
26-28	Fundamentals of Hypothesis Testing Methodology	The Null and Alternative Hypotheses, Critical value of the Test Statistics, Regions of Rejection and Nonrejection, t - test of Hypothesis for the Mean, One tail Tests, Z-test of Hypothesis for the proportion	T2, R4, Class notes
29-34	Simple Linear Regression	Determining the Simple Linear Regression Equation- The Least-Squares method, Exploring Simple Linear Regression Coefficients; Measures of Variation; assumptions; Residual Analysis; Measuring Autocorrelation; Inferences About the Slope and Correlation Coefficient; Estimation of Mean Values and Prediction of Individual Values	R3, R4, Class notes
35-37	Linear Programming Models: Graphical and Computer Methods	Developing a Linear Programming Model, Formulating a Linear Programming Model, Graphical solution of a Linear Programming Model with two variables, Need for simplex method; How to solve LP problems by simplex method; Different types of problems; Setting up and solving Linear Programming using Excel's Solver	T1, R3, Class notes
38-40	Linear Programming Modeling Applications	Model a wide variety of linear programming problems, Application areas for linear programming problems including manufacturing, marketing, finance, employee staffing, transportation, blending and multi-period planning	T1, R3, Class notes
41-42	Transportation, Assignment and Network Models	Characteristics of Network models, Setup and solve transportation models using Excel's solver, Setup and solve transportation models with Max-Min and Min-Max objectives, Assignment Model	T1, R3, Class notes



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6. Evaluation Component

S. No.	Evaluation Component	Duration	Max. Marks	Date & Time	Remarks
1	Mid-Semester Examination		30	9/10 10:00 - 11:30 AM	OB
2	Surprise Quizzes		20		CB
3	Case Study /Article Presentations/ Project or Assignment		10		
4	Comprehensive Examination	3 Hours	40	10/12 AN	CB

7. Chamber Consultation Hour: 12 AM -Thursday

8. Notice: All notices will be displayed on **Department of Management Notice Board**.

Instructor-In-Charge



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