Centre for Management Studies

Dibrugarh University

Course Code : 20600
Course Name : Quantitative Techniques
Course Type : Core
Prerequisites : None
Objective : The main objective of the course is to make students comfortable with quantitative techniques and use mathematical and statistical models in quantitative decision making.
Credit : 4 (3 – 0 – 1)
Pedagogy **:** Lectures, Presentations & Practical-s
Evaluation : *Internal assessment*: 40 marks (2 Sessional Examinations – 10 marks each totaling 20 marks, Class Participation – 5 marks, Practical – 15 marks); *End Semester Examination*: 60 marks
Instructor : Himadri Barman (himadri@cmsdu.org)
Web links : http://himadri.cmsdu.org, https://clasroom.google.com
Outcomes : Learners will be able to use various mathematical and statistical models in quantitative decision making. Additionally, they will be able to use spreadsheet software in business modeling and analysis.

Unit	Topics	No. of Lectures	No. of Tutorials	No. of Practicals
1	Quantitative Analysis – Basics, Modeling Problems	2	0	0
2	Mathematical Basics – Sets, Relations, Functions, Differential & Integral Calculus, Matrices, Determinants	15	0	7
3	Probability and Applications – concepts, distribution	6	0	6
4	Statistical Hypothesis – basics, testing	8	0	6
5	Decision Models, Regression Models, Forecasting	5	0	6
6	Operations Research – Linear Programming, Transportation Problems, Game Theory	10	0	3

Total Lectures : 42
Total Tutorials : 0
Total Practicals : 28

Suggested Readings:

1. Quantitative Methods – D R Agarwal, Vrinda Publication (P) Ltd.
2. Quantitative Techniques of Managerial Decisions – U K Srivastava, G V Shenoy, S C Sharma, New Age
3. Operations Research – S Kalavathy, Vikash Publishing House (P) Ltd.
4. Mathematics for Business & Economics – J K Sharma, Asian Books Private Limited

Detailed Course Outline

Unit 1:
Quantitative Analysis Approach, Advantages of Mathematical Modelling (1 – 2)

Unit 2:
Set Theory (3 – 4); Relations (5); Functions and Applications (6 – 7); Limits & Continuity (8 – 9); Differentiation – standard differentials, rules of differentiation, partial differentiation (10 – 13), Applications of Differentiation – maxima & minima (14 – 15); Integration – standard integrals, integration by parts (16 – 17); definite integrals and applications (18 – 19);

Matrices & Determinants – basics (21 – 24), Solution of equations (25 – 27)

Unit 3:
Permutations and Combinations (29); Probability – concepts and techniques of finding probabilities (30 – 33); Probability Distributions – the basics (34), Binomial, Poisson and Normal Distributions (35 – 36);

Unit 4:
Samples and Sampling Distributions (38 – 39); Estimation and Hypothesis formulation (40 – 41); Hypothesis testing (42 – 44), Chi –square Test & ANOVA (45 – 46)

Unit 5:
Decision Making Scenarios (48); Sensitivity Analysis & Decision Trees (49); Correlation & Regression (50 – 51); Forecasting techniques (52 – 53)

Unit 6:
OR basics (55), Linear Programming - Formulation and Graphical Method (56), Simplex Method (57); Transportation Problems – formulation, NW Corner Method and VAM (58 – 59); Game Theory – basic concepts (60), Solving Problems involving Mixed Strategies – only 2 x 2 games (61 – 63)

Practicals:
MS Excel 2007/10 - Use of formulas appropriate for this course.

Numbers in the brackets indicate session number. Session Numbers 20, 28, 37, 47, 54 and 64 will be review sessions.