

DEPARTMENT OF APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCE
M.B.A. I Semester
MAA 1104: MATHEMATICS AND STATISTICS FOR MANAGERS

HOURS PER WEEK			CREDITS			MAXIMUM MARKS				
T	P	TU	T	P	TU	THEORY		PRACTICAL		TOTAL MARKS
						CW	END SEM	SW	END SEM	
3	--		3	--	--	30	70	--	--	100

COURSE OBJECTIVE

To introduce mathematical and statistical techniques and their application to business problems. The emphasis will be on the concepts and application rather than derivations.

COURSE OUTCOMES

After completion of the course, students are able to

- CO#1** understand the basic concepts of set theory and probability theory.
- CO#2** solve the linear equations using the concept of matrices.
- CO#3** understand the fundamentals of statistic.
- CO#4** understand the various theoretical distributions .
- CO#5** use the concept of time series in prediction and decision making.

COURSE CONTENTS

THEORY

- Unit 1 Sets theory and probability: Sets, Subsets, Types of Sets, and Operations on Sets, Cartesian Product of Sets, and Applications. Probability Theory: Concepts, Additive, Multiplicative, Conditional Probability Rules, Baye's Theorem.
- Unit 2 Determinants and Matrices with Business Application: Types of Matrices, Operations on Matrices, Adjoint Matrix, Inverse Matrix, Elementary Row Operations. Solution of Simultaneous Linear Equations using Matrices, Input/ Output Analysis.
- Unit 3 Introduction to Statistics: Meaning and Definition of Statistics, Scope and Limitations of Statistics, Role of Statistics in Management Decisions, Measures of Central Tendency and Dispersion. Correlation and Regression.
- Unit 4 Probability Distributions: Theoretical distributions - Binomial, Poisson and Normal Distributions. Their characteristics and applications.

Unit 5 Time Series and Statistical Decision Theory: Time Series and Its Components, Analysis, Models of Time Series, Measurement of Trend, Seasonal Variations and Cyclic Variations. Introduction to Statistical Decision Theory, Decision Making Process, Decisions under Uncertainty and Risk, Decision tree.

ASSESSMENT

1. Internal Assessment for continuous evaluation, mid-term tests, assignments, seminars, class performance, etc.(30%)
2. End semester Theory Exam(70%).

TEXT BOOKS RECOMMENDED

1. J.K. Sharma, Mathematics for Management and Computer Applications, Galgotia Publication
2. D.N. Elhance, Veena Elhance , Fundamentals of Statistics, KitabMahal,1964
3. R. K. Ghosh and S. Saha, Business Mathematics and Statistics, Calcutta, New Central Book Agency,2012

REFERENCE BOOKS

1. J. N. Kapur and H. C. Saxena, Mathematical Statistics, S Chand and Company Ltd.,2013
2. Jayprakash Reddy and M. Reddy, A Text Book of Business Mathematics, Ashish Publishing House,2004

DEPARTMENT OF APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCE
M.B.A. II Semester
MAA 2102: QUANTITATIVE DECISION MAKING

HOURS PER WEEK			CREDITS			MAXIMUM MARKS				
T	P	TU	T	P	TU	THEORY		PRACTICAL		TOTAL MARKS
						CW	END SEM	SW	END SEM	
4	--	--	3	--	--	30	70	--	--	100

COURSE OBJECTIVE

The objectives of this course are to help the students acquire quantitative tools, and use these tools for the analysis and solution of business problems. The emphasis will be on the concepts and application rather than derivations.

COURSE OUTCOMES

After completion of the course, students are able to

- CO#1** understand the basic concept of quantitative techniques.
- CO#2** understand different methods for solving linear programming problems.
- CO#3** find basic feasible solution of transportation problem by various methods.
- CO#4** use the concept of waiting line model to solve real life problems
- CO#5** apply simulation techniques in various physical models

COURSE CONTENTS

THEORY

- Unit 1 Quantitative Techniques and Operations Research: Meaning, Scope of Quantitative Techniques and Operations Research in Management, Advantages and Limitations of Quantitative Techniques/Operation Research, Operation Research Process.
- Unit 2 Linear Programming: Meaning of Linear programming, General Mathematical Formulation of LPP, Graphical Analysis, Solution of LPP: Simplex Method, Big- M Method, Advantage and limitations of LPP.
- Unit 3 Transportation Model: Transportation Problem as a particular case of LPP Mathematical Formulation, Initial Basic Feasible Solution, Vogel's Approximation Method, Optimization (Minimization and Maximization) using Modified Distribution Method and Stepping Stone Method.

Unit 4 Waiting Line Models and Game Theory: Introduction, Scope in Management Decisions, Queuing Models – Single Server, Multi server with infinite capacity. Introduction to Games, Maximin and Minimax Principles, Pure and Mixed Strategies, Rule of dominance, Solutions of Games using –Algebraic and Graphical Methods, Game Theory and Linear Programming.

Unit 5 Markov Chain Analysis and Simulation: Computation of sequential probability of states for different periods, Steady State Probability of states and application of Markov Chain. Introduction to simulation, Monte Carlo Technique and its applications, single stage and multi stage simulation.

ASSESSMENT

1. Internal Assessment for continuous evaluation, mid-term tests, assignments, seminars, class performance, etc.(30%)
2. End semester Theory Exam (70%).

TEXT BOOKS RECOMMENDED

1. Gupta, Kanti Swaroop, Gupta P.K. and Manmohan, Operations Research, Sultan Chand and Sons, New Delhi.
2. N.D Vohra, Quantitative Techniques, Tata McGraw Hill, New Delhi, India.
3. P. K. Gupta and D. S. Hira, Operations Research, Sultan Chand Publications, New Delhi.

REFERENCE BOOKS

1. S. D. Sharma, “Operations Research”, KedarNath Ram Nath and Co. Meerut, India
2. Rathindra P Sen Operation Research, PHI publications, India
3. Winston, Wayne L., Operation Research applications and algorithms, Wadsworth Publishing Company, Australia.