

VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

LESSON PLAN

Semester: II, MCA

Subject- Quantitative Technique

Session: Even semester 2017

Branch: Physics, Chemistry, Mathematics

Name of Faculty: Dr. N. K. Sahu

Period	Module/ Number	Topic to be covered	Remarks
1	I	Introduction to Operations Research, Decision making	
2	I	Linear Programming, Mathematical formulation of the problem	
3	I	Graphical method, Convex sets, Convex functions	
4	I	Simplex method, Penalty method	
5	I	Two-Phase method	
6	I	Sensitivity analysis: Change in cost vector	
7	I	Change in right hand side vector (b vector)	
8	I	Addition and deletion of variables, Addition and deletion of constraints	
9	I	Transportation problem, Basic feasible solution of TP	
10	I	Optimal solution of transportation problem	
11	I	Assignment problem	
12	II	Integer programming problem: Cutting plane algorithm	
13	II	Branch and bound algorithm	
14	II	Introduction to queuing	
15	II	Single server model	
16	II	Multi server model	
17	II	Game theory: Two person zero sum game	
18	II	Solution of mixed strategy game	
19	II	Graphical solution of $2 \times n$ and $m \times 2$ games	
20	II	Dominance property	
21	II	Minimal spanning tree algorithm	
22	II	Shortest route problem	
23	III	Classical probability	
24	III	Axiomatic definition of probability, Conditional probability	
25	III	Addition and multiplication rule, Total probability	
26	III	Bayes' theorem and Independence	
27	III	Random variables, Discrete random variables	
28	III	Probability mass function, Probability distribution function, Cumulative distribution function	
29	III	Mathematical expectation, moments	
30	III	Moment generating functions,	
31	IV	Binomial distribution	
32	IV	Poisson distribution	
33	IV	Continuous random variable, Probability density functions	
34	IV	Examples, Problems discussion	

35	IV	Normal distribution	
36	IV	Exponential distribution	
37	IV	Joint probability distribution, Marginal probability	
38	IV	Conditional probability distributions	
39	IV	Functions of a random variable, Product moments, Independence of random variables	
40	IV	Bivariate normal distribution	

Quantitative Techniques

4 Credits [3-1-0]

Module-I

Introduction to Operations Research and Decision Making, Linear Programming Problem, Simplex Methods, Penalty Method, Two-phase method, Sensitivity Analysis, Transportation problem, Assignment problem.

Module-II

Integer programming problem: Cutting plane method, Branch and bound method, Introduction to queuing: Single server model, Multi server model, Game Theory: Two person zero sum game, mixed strategy games, Minimal spanning tree problem, Shortest route problem.

Module – III

Classical probability, Relative frequency, Axiomatic definition of probability, Conditional probability, Independent events, Bayes' Theorem, Discrete and Continuous random variables, Probability distribution function, Density function, Mathematical expectations, Moments, Moments generating function.

Module – IV

Special probability distributions: Binomial distribution, Poission distribution, Geometric distribution, Normal distribution, Exponential distribution, Joint probability distributions, Functions of a random variable, Product moments, Bivariate normal distribution.

Text Book

1. Taha, Operations Research, PHI
2. Jhon, E. Freund, Mathematical Statistics, PHI
3. Trivedi, Probability Statistics, PHI