

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

T.Y. B.Sc.

Mathematics

OR (CAN)

(OPERATIONS RESEARCH)

General discussion of Linear Programming Problems :

Model formulation, Basic, Non-basic, Degenerate, Non-degenerate and basic feasible solutions of LPP, Slack & surplus variables. LPP in the standard matrix form.

Methods of solving LPP :

Simplex Method, Two Phase method, Biga-M method, Duality of LPP, The symmetric and • non-Symmetric dual problems. Relation between primal & dual problems.

Transportation Problems :

Methods for finding initial basic feasible solution, Optimal solution of TP problem by MODI method, Unbalanced T.P.

Assignment problems: The Hungarian method, Balanced & Unbalance assignment problems.

Game Theory

Competitive games, No person Zero-sum game, Maximin and Minimax Principle, Saddle points and the value of the game (based on pure strategies), Mixed strategies, Solution of games with saddle point, Dominance rule, Solution of $m \times 2$ and $2 \times n$ games using graphical method.

Inventory Models :

Basic definition of parametric association with inventory problems, various costs associated with inventory problems. Inventory models with finite and infinite rate of replenishment with and without shortages.

The course is covered by the following reference books

1. J.K. Sharma : ().R. Theory & Applications, Mac Milian India Ltd., 1998.
2. Kanti Swaroop. P.K.Gupta & Man Mohan : Operations Research, S. Chand & Sons, New Delhi, 1098.
3. G. The Hardy : Linear Programming, Narosa Publishing House, New Delhi, 1995.
4. G. Paria : LInear Program ming, transportation, Assignment Game, Books & Allied Pvt. Ltd. Calcutta - 9.
5. P.M. Karak Linear Programming, New Central Book Agency Pvt. Ltd. Calcutta - 9.
6. K.V. Mittal & L.Mohan ; OptimiZation methods in O.R. and System Analysis, New Age International Publications.
7. Goel & Mittal : O.R., Pragali Prakashan, Meerut.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

T.Y. B.Sc.

Mathematics
MM (CAN)

(MATHEMATICAL MODELLING)

The process of applied mathematics, Mathematical modelling—an introduction, Basic steps to construct models of real world problems, setting up first order differential equations, Qualitative solution sketching graphically and interpretation.

First order differential equation models: Spread of epidemic disease for susceptible and infectious (SI) model, Susceptible Infectious and Susceptible (SIS) model, Susceptible Infectious with Removable (SIR) model, their solutions with physical interpretation.

New- technological Innovation models for direct contact and mixed contact, their maximum and minimum values and graphs.

Network model of LR circuit with constant EMF, Growth and decay of current cases, RL circuit with variable EMI', RC circuit with charging of capacitor and discharging of capacitor with constant EMI', LCR network models, First order differential equations and examples on it.

Single species population modes. Population growth—Non age structure model, Smith's model, generalized logistic model, Logistic model for a non-isolated population and expansion.

Simple prey–predation model, Basic equation, 'Trajectory, Stability and equilibrium position, Model for political sciences, Proportional representation, Cumulative voting, Comparison voting, Applications in Ecological and Environmental subject areas, Urban water management.

The course is covered by the following reference books:

1. Models of Applied Mathematics: Springer–Verlag. 1982:
Vol.1 : Eds. Martin Braun, C.S.Coleman, D.A.Drew : Differential Equation models.
Vol.2: Steven .J.Bram P.D.Strafftn (Eds.)-. Political and related models.
Vol.3: W.F.Lucas, F .S.Roberts, R.M.Thrall District and System models.
Vol.4: H.M.Roberts and M. Thompson : Life Science models.
2. A.P.Verma and M.N.Mehta : Mathematics with Applications. Part I and II; Shivam Book Pith.
- 3.J.N.Kapur : Mathematical Models in Biology and Medicine, Allied E– W Press.

[Formally this paper was in the list of CAN courses. It is not mentioned in the new structure. It may be rectified in the new structure.]