23ES22T2 -OPTIMIZATION TECHNIQUES

(Common to CSE-DS, CSE-AI & ML and IT)

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| Course Category: |  Engineering Science | Credits: | 2 |
| Course Type: | Theory | Lecture-Tutorial-Practical: | 2-0-0 |
| Prerequisite: | Engineering Mathematics | Sessional Evaluation:Univ. Exam Evaluation:Total Marks: | 3070100 |
| Objectives: | **Students undergoing this course are expected:** |
| * To provide the basic knowledge about Optimization, importance, application

areas of in the industry, Linear Programming.* To impart different optimization models under typical situations in the

business organization like transportation, assignment.* To understand the process of sequencing in a typical industry.
* To describe different game strategies under cut-throat competitive business

environment* To develop networks of activities of projects and to find out optimal modes

of completing projects using network modelling evaluation techniques. |

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| Course Outcomes | Upon successful completion of the course, the students will be able to: |
| CO1 | Understanding Optimization and Formulation of Linear Programming Models(L1) |
| CO2 | Formulate and Solve Transportation &amp; Assignment Models(L3) |
| CO3 |  Sequencing of operations and optimizing(L2) |
| CO4 |  Discuss the game theory and strategies(L2) |
| CO5 | Developing networks of activities and finding optimal mode of projects evaluation.(L3) |
| Course Content | UNIT-IIntroduction: Meaning, Nature, Scope &amp, Significance of Optimization -Typical applications. The Linear Programming Problem – Introduction, Formulation of Linear Programming problem, Limitations of L.P.P, Graphical method, Simplex method: Maximization and Minimization model(exclude Duality problems), Big-M method and Two Phase method.UNIT-II**Transportation Problem:** Introduction, Transportation Model, Finding initial basic feasible solutions, Moving towards optimality, Unbalanced Transportation problems, Transportation problems with maximization, Degeneracy. Assignment Problem – Introduction, Mathematical formulation of the problem, Solution of an Assignment problem, Hungarian Algorithm, Multiple Solution, Unbalanced Assignment problems, Maximization in Assignment Model.UNIT-IIISequencing: Job sequencing, Johnsons Algorithm for n Jobs and Two machines, n Jobs and Three Machines, n jobs through m machines, two jobs and m Machines Problems.UNIT-IVGame Theory: Concepts, Definitions and Terminology, Two Person Zero Sum Games, Pure Strategy Games (with Saddle Point), Principal of Dominance, Mixed Strategy Games (Game without Saddle Point), Significance of Game Theory in Managerial Application.UNIT-VProject Management: Network Analysis, Definition, objectives, Rules for constructing network diagram, Determining Critical Path, Earliest &amp, Latest Times, Floats, Application of CPM and PERT techniques in Project Planning and Control, PERT Vs CPM.(Exclude Project Crashing).  |
| Text Books &ReferencesBooks | TEXT BOOKS: 1. Operations Research / R. Pannerselvam, PHI Publications.2. Operations Research / S.D. Sharma Kedarnath3. Operations Research /A.M. Natarajan, P. Balasubramani, A.Tailarasi/Pearson Education. 4. Engineering Optimization: Theory and practice / S.S.Rao, New Age International (P)LimitedREFERENCE BOOKS:1. Quantitative Techniques in Management / ND Vohra, Tata McGraw Hill,2. 4th Edition, 2011.3. Introduction to O.R/Hiller &amp;Libermann (TMH).4. Operations Research: Methods &amp, Problems / Maurice Saseini,5. Arhur Yaspan & amp, Lawrence Friedman. Pearson6. Quantitative Analysis For Management/ Barry Render, Ralph M. Stair,7. Jr and Michael E. Hanna/ Operations Research / Wagner/ PHI Publications. |
| E-Resources | 1. <https://onlinecourses.swayam2.ac.in/cec20_ma10/preview>2. <https://onlinecourses.nptel.ac.in/noc20_ma23/preview>3. https://onlinecourses.nptel.ac.in/noc19\_ma29/preview |