Title: Optimization (ICT Elective)
Course code: IE402
Structure: 3-0-2-4
Purpose: The main purpose of this course is to provide the students working knowledge of optimization methods in a few selected areas.
Pre-requisite: Linear Algebra
Contents
1. Introduction to optimization methods
   - Introduction
   - Formulation of an LPP
   - Graphical Method to solve an LPP
   - Nature of a solution
2. Linear programming problem
   - Algebraic method
   - Simplex method
   - Revised simplex method
   - Duality
   - Dual simplex method
   - Sensitivity analysis
3. Transportation problem
   - North-west corner Rule
   - Row-minimum method
   - Vogels Approximation
   - u-v method
4. Introduction to Game Theory (Decision making under competition)
   - Game with pure strategies
   - Game with mixed strategies
   - Dominance property
   - Graphical method for $2 \times n$ (or $m \times 2$) Games
5. Introduction to Queuing Model (6 hr.s)
   - Characteristics involved in queuing models
   - Markovian models (variations of M|M|1 and M|M|c models)
References:
1. An introduction to optimization by E. K. P. Chong and S. H. Zak (Wiley)

2. Engineering optimization Theory and practice by S. S. Rao (New Age international Pvt. Ltd.)

3. Operation research: An introduction by H. Taha (Prentice Hall, India)

4. Operation Research by R. Panneerselvam (Prentice Hall, India)

5. Linear Programming and Game Theory by D. Chatterjee (Prentice Hall, India)

6. Quantitative Techniques for Decision Making by Gupta and Khanna (Prentice Hall, India)

7. Optimization in operation research by Rardin (Pearson Education)

**Evaluation**

1. In-sem exam (30%)
2. Final exam (40%)
3. Projects/ Assignments (30%)

I will add the marks of all four components.

**Mechanisms/modalities for online delivery of lecture/lab/tutorial sessions**

I shall take the class during regular timetable. Sometimes recorded the videos and uploaded well before the class. During class time, I shall clarify their doubts and solve problems based on uploaded lectures.