Course Title: Optimization

Course Code: IE402

Credit Structure (L-T-P-Cr): 3-0-2-4

Instructor’s Name with email: Manish Kumar (manish_kumar@daiict.ac.in)

Prerequisites: Fundamental nature basic understanding of Linear Algebra, Communication Engineering.

Suggested Textbook/references:
Operations Research by HA Taha 8th/9th Edition
An introduction to optimization by E. K. P. Chong and S. H. Zak (Wiley)
Linear Programming and Game Theory by D. Chatterjee (Prentice Hall, India)

Evaluation Scheme

- In Semester Exam (35%)
- End Semester Exam (50%)
- Project/Lab Assignments (15%)

The marks of all the components would be duly considered.

Course Outcome:
After the completion of course:

- The students will be able to understand the application and working knowledge of optimization in selected areas.
- The students will develop an insight and understanding with respect to formulation of optimization problems and designing the optimal solutions with applications in various domain and engineering applications.
- The students will get acquainted with applications of optimization in communication technology and relevant work being carried out in certain wireless communication industry.
Lecture Plan/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. Game Theory
   • Introduction to Game Theory
   • Game with pure and mixed strategies
   • $2 \times n$ and $m \times 2$ Games
   • LPP Formulation of $m \times n$ Games

5. Optimization for Communication Technology
   • Application of optimization in Communication Technology - I
   • Application of optimization in Communication Technology - II