Course Title: Optimization

Semester and Year: 5th semester (2019 Batch), 7th semester (2018 Batch)

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

Course Code: IE402

Prerequisites (if any): Fundamental nature: Just a basic understanding of Linear Algebra, Communication Engineering.

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

Course Objectives: The objective of this course is to provide the students with working knowledge of optimization in methods in few selected areas. Insights would be given on applications of optimization in communication technology and relevant work being carried out in some current wireless communication industry.

Suggested Textbook/references:

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)

Mode of Delivery: Online (as of now)

Evaluation Scheme

- Assignments (20%)
- InSem Exam (30%)
- End Sem Exam (50%)

I will add the marks of all the components

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 × n and m × 2 Games
• LPP Formulation of m × n Games

5. Application of Optimization for Communication Technology
• Optimization in cognitive radio applications
• Optimization in cooperative cellular transmissions
• Optimization in MIMO Communications-I
• Optimization in MIMO Communications-II