

**B.Sc(H) Computer Science 3rd Sem
Numerical Optimization
Guidelines**

Unit	Content with chapters & page nos.	Reference	Duration
1	Chapter1+ Solution by graphical method	[1]	13 Hrs
	Simplex Method with all special cases chapter 5 till 5.6	[3]	
2	2.1 without proof of theorems 9.1-9.6	[1]	12 Hrs
		[2]	
3	9.7 till pg 350	[2]	6 Hrs
4	8.1	[1]	6 Hrs
5	12.1 till pg 313 + Langrangian Method Numerical Approach	[1]	8 Hrs

Note: Proof of all theorems and Lemmas can be skipped

Essential/recommended readings

1. J. Nocedal and S.J. Wright, *Numerical Optimization*, 2nd edition, Springer Series in Operations Research, 2006.
2. A, Mehra, S Chandra, Jayadeva, *Numerical Optimization with Applications*, Narosa Publishing House, New Delhi, 2009,
3. J. Matousek and Bernd Gartner, *Understanding and using Linear programming*, Springer

Practicals must be done in Python

Practical list

1. WAP for finding optimal solution using Line Search method.
2. WAP to solve a LPP graphically.
3. WAP to compute the gradient and Hessian of the function

$$f(x) = 100(x_2 - x_1^2)^2 + (1 - x_1)^2$$

4. WAP to find Global Optimal Solution of a function

$$f(x) = -10\cos(\pi x - 2.2) + (x + 1.5)x \text{ algebraically}$$

5. WAP to find Global Optimal Solution of a function

$$f(x) = -10\cos(\pi x - 2.2) + (x + 1.5)x \text{ graphically}$$

6. WAP to solve constraint optimization problem.