KALASALINGAM UNIVERSITY

[Kalasalingam Academy of Research and Education]

Anand Nagar, Krishnankoil – 626 126

DEPARTMENT OF MATHEMATICS

COURSE PLAN

Name of the Faculty : Dr.K.Karuppasamy

Subject with code : *MAT5101 – Applied Mathematics*

Course : M.Tech.,

Semester/Branch : I / PSE, EST, PED, C&I, CSE, NW, IAS, ENERGY, CAD/CAM

1. Text Books:

1. Singiresu S. Rao, *Engineering Optimization*, New Age International (P) Ltd., 2001
2. Gupta S.C. and Kapoor V.K. *Fundamentals of Mathematical Statistics*, Sultan Chand and Sons, Newdelhi, 2001.
3. Lewis D.W. *Matrix Theory*, Allied Publishers, Chennai, 1995.

2. References:

1. S.D. Sharma, *Operations Research*, Kedar Nath Ram Nath & Co.,
2. M.K. Ochi, *Applied Probability and Stochastic Processes*, John Wiley & Sons, 1992.
3. Bronson R. *Matrix Operations*, Schums Outline Series, Tata McGraw Hill, Newyork.

3. Lesson Plan:

S. No.	TOPIC NAME	Text Book	No. of Periods	Cumulative no. of periods
	UNIT – I : CLASSICAL OPTIMIZATION TECHNIQUES			
1	Statement of Optimization Problem – Classification – Optimization Technique	**T1**	**1**	**1**
2	Unconstrained Optimization	**T1**	**1**	**2**
3	Equality Constraints – Inequality Constraints	**T1**	**1**	**3**
4	Lagrange's Multiplier Method	**T1**	**1**	**4**
5	Kuhn Tucker Condition – Indirect Search Methods	**T1**	**2**	**6**
6	Gradient of a function – Steepest Descent Method – Conjugate Gradient Method	**T1**	**2**	**8**
7	Newton's Method	**T1**	**1**	**9**

	UNIT – II : LINEAR PROGRAMMING			
8	Standard Form of Liner Programming Problem – Definitions and Theorems – Solution of Linear Simultaneous Equations	**R1**	**1**	**10**
9	Simplex Algorithm	**R1**	**2**	**12**
10	Graphical Method	**R1**	**1**	**13**
11	Dual Simplex Method	**R1**	**1**	**14**
12	Transportation Problem – Applications	**R1**	**4**	**18**
	UNIT – III : MATRIX THEORY			
13	Matrix Norms	**R3**	**1**	**19**
14	Jordan Canonical Form Generalized Eigen Vectors	**R3**	**2**	**21**
15	Singular Value Decompositions	**R3**	**2**	**23**
16	Pseudo Inverse	**R3**	**1**	**24**
17	Least Square Approximations – QR Algorithms	**R3**	**3**	**27**
	UNIT – IV : PROBABILITY AND RANDOM PROCESS			
18	Probability – Random Process Variables	**R2**	**1**	**28**
19	Binomial, Poisson, Geometric, Uniform, Normal, Exponential Distributions	**R2**	**4**	**32**
20	Moment Generating Functions and their Properties	**R2**	**2**	**34**
21	Functions of random variables	**R2**	**2**	**36**
	UNIT – V : QUEUING THEORY			
22	Single and Multiple Server Markovian Queuing Models	**T2**	**6**	**42**
23	Customer Impatience	**T2**	**2**	**44**
24	Queuing Applications	**T2**	**1**	**45**

Prepared by ***Verified by***

Staff Incharge ***[HOD/Maths]***