



FIRST SEMESTER 2020 - 21
Course Handout Part - II

17-08-2020

In addition to Part I and Part II (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course Number : **BITS F218**
Course Title : **General Mathematics III**
Instructor-In charge : Jagan Mohan Jonnalagadda
Instructor : Dipak Kumar Satpathi

Scope and Objective of the Course: The course is made for Pharmacy students keeping in mind the importance of Linear Algebra and Linear programming problems and their possible applications in various fields of science and engineering. Linear algebra begins with vectors and matrices – two of the most important practical concepts in mathematics. Whereas linear programming is a method to achieve the best outcome in a mathematical model whose requirements are represented by linear relationships. Linear programming can be applied to various fields of study. It is used in business and economics, but can also be utilized for some engineering problems. Industries that use linear programming models include transportation, energy, telecommunications, and manufacturing.

1. Text Books:

T1: Erwin Kreyszig Advanced Engineering Mathematics, Wiley India, 10th Edition, 2011.
T2: Hamdy A Taha, Operations Research: An Introduction, Pearson / PHI, 10th Edition, 2018.

2. Reference Books:

R1: Bernard Kolman, David R. Hill, Elementary Linear Algebra with Applications, Ninth Edition, 2008.
R2: S. S. Rao, Engineering Optimization: Theory and Practice, New Age International (P) Limited, 3rd Edition, 1996.
R3: B. S. Grewal, Higher Engineering Mathematics, 44th Edition, Khanna Publishers, 2017.

3. Course Plan:

Lect. No.	Learning objectives	Topics	Ref to Textbook
	I		
1 - 2	To learn the rule of addition, multiplication of two matrices and transpose of a matrix.	Matrices, Vectors: Addition and Scalar Multiplication, Matrix Multiplication	T1 (7.1 - 7.2)
3 - 6	To identify system of equations, coefficient and augmented matrix, to understand how to apply elementary row operation to reduce a matrix into echelon form.	Linear Systems of Equations, Gauss Elimination	T1 (7.3)
7 - 8	Interpret linear systems as matrix	Solutions of Linear Systems:	T1 (7.5)

	equation. To solve the system of homogeneous and inhomogeneous equations. To understand the meaning of consistent and inconsistent systems, concept of unique solution, infinite solution and no solutions.	Existence, Uniqueness	
9 - 12	To find determinant of a matrix, inverse of a matrix (if it exists) using row transformation, and Adjoint of a matrix and to understand Cramer's rule.	Second- and Third-Order Determinants, Determinants, Cramer's Rule, Inverse of a Matrix, Gauss-Jordan Elimination	T1 (7.6 – 7.8)
13 - 15	To understand the meaning of linear independence/dependence and span, Basis and dimensions.	Linear Independence, Rank of a Matrix, Vector Space	T1 (7.4)
16 - 21	Identify the linear transformation; Determine the standard matrix of a linear transformation.	Vector Spaces, Linear Transformations	T1 (7.9)
	II		
22 - 25	To understand the meaning of Linear programming, its importance and applications, concept to formulate a linear programming problem, solving LPP involving two decision variables using graphical methods.	Introduction to LP – Formulation to LPP, Graphical Solutions	T2 (2.1, 2.2, 2.4)
26 - 31	To introduce and explain the computational procedure of the simplex method, artificial starting solution (M method and two phase method), Introduce various special cases.	Algebraic Solutions - Simplex Method, Artificial Variable Method, Special Cases	T2 (3.1 - 3.5)
32 - 34	The concept of Duality, computational techniques for Dual simplex method and interpretation.	Duality and Dual Simplex Method	T2 (4.1, 4.2, 7.4, 4.4.1)
35	To analyze the post optimal results subject to the change of objective function coefficient, constraints, addition and subtraction of variable etc.	Introduction to Post Optimal Analysis	T2 (4.5)
36 - 39	To deal various Transportation and Assignment problems using various computational methods.	Transportation and Assignment Problem, Finding BFS, Using North-West Corner Rule, LCM & VAM, Modi's Method, Hungarian Method for Solving Assignment Problem	T2 (5.1, 5.3, 5.4)
	III		
40 - 43	To understand the techniques to solve	Single Variable Unconditional	R2 (5.7)



	non-linear programming problems where the objective function is non-linear.	Optimization, Fibonacci Search Method, Golden Section Search Method, Gradient Based Method	T2 (21.1.2)
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4. Evaluation Scheme:

Sl. No.	Evaluation Component	Duration	Weightage (%)	Date and Time	Nature of Component
1	Test - 1	30 Minutes	15	September 10 – September 20 (During scheduled class hour)	Open
2	Test – 2	30 Minutes	15	October 09 – October 20 (During scheduled class hour)	Open
3	Test - 3	30 Minutes	15	November 10 – November 20 (During scheduled class hour)	Open
4	Assignment - 1	-	15		Open
5	Assignment - 2	-	15		Open
6	Comprehensive Examination	120 Minutes	25	TBA	Open

- Announcements:** All announcements in relation to the above course will be displayed on CMS.
- Make up policy:** Make up for the tests / comprehensive examination will be given to genuine cases. No make up will be entertained for assignments.
- Consultation hours (through Google Meet):** Link will be provided in the course page.
- Academic Honesty and Integrity Policy:** Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor In-Charge
BITS F218

