GANPAT UNIVERSITY								
FACULTY OF ENGINEERING & TECHNOLOGY								
Programme	Bachelor of Technology			Branch/Spec.	Computer Science & Engineering (CBA/CS/BDA)			
Semester	II			Version	1.0.0.0			
Effective from Academic Year		2020-21		Effective for the batch Admitted in			June 2020	
Subject code	2HS102		Subject Name	Linear Algebra				
Teaching scheme				Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total

(Per week)	L	TU	P	TW	Total		CE	SEE	Total
Credit	3	1	0	0	4	Theory	40	60	100
Hours	3	1	0	0	4	Practical	0	0	0

Pre-requisites:
Simple arithmetic skills

Learning Outcome:
Upon completion of this course, students will be able to: ● Understand all basic fundamentals of Matrices and Vectors. ● Prepare him/herself for solving a Linear equation. ● Prepare him/herself for Learning Advance Mathematics in coming semester. ● Apply knowledge of matrices and vectors in various applications of his/her branch.

Theory syllabus		
Unit	Content	Hrs
1	**Matrix Algebra:** Review of algebra of matrices & elementary transformations, Rank of a matrix, inverse of a matrix by Gauss-Jordan method, normal form of a matrix, Solution of system of algebraic simultaneous equations, Linear dependent and Linear independent vectors. Eigen values and Eigen vectors, Eigen values and Eigen vectors of: Symmetric, Skewsymmetric, Hermitian, Skewhermitian, Unitary and Normal matrix, Algebraic and Geometric multiplicity, Diagonalization, Spectral theorem for real symmetric matrices, Application of Quadratic forms.	22
2	**Vector Space :** Vectors in R^n and its properties, Dot product, Norm and Distance properties in R^n, Pythagorean theorem in R^n ,Definition and Examples of vector spaces, Vectorsubspace, Linear Independence and dependence ,Linear span of set of vectors, Basis of subspaces, Extension to basis.	5
3	**Linear Transformation :** Definition and basic properties, Types of linear transformation(Rotation,reflection,expansion,contraction,shear,projection),Matrix of linear transformations,Change of basis and similarity, Rank nullity theorem	4
4	**Infinite Series :** Definition, Comparison test, Cauchy's integral test, ratio test, root test, Leibniz's rule for alternating series, power series, range of convergence, uniform convergence.	14

Practical content
Not Applicable

Mooc Course
Course Name: Introduction to Abstract and Linear Algebra
Link: https://onlinecourses.nptel.ac.in/noc18_ma16

Text Books

1	Higher Engineering Mathematics by Dr. B. S. Grewal
2	Vector Calculus and Linear Algebra by Dr. A.R.Patel&Dr.H.C.Patel
Reference Books	
1	Higher Engineering Mathematics Vol. I & II by Dr. K. R. Kachot.
2	Advanced Engineering Mathematics (Fifth Edition), Erwin Kreyszig.
3	Applied mathematics for engineering by Dr. R. C. Shah.