

No.	Title		
1.	Subject	Vectors and Matrices	
2.	Subject Code	KE017	
3.	Status	Major	
4.	Credit Hours	Three (3) [(3L+1T) × 14 weeks]	
5.	Semester and Year	Semester 2	
6.	Pre-requisite	-	
7.	Mode of Delivery	Lectures and Tutorials	
8.	Assessment	Assignments/Tests	40%
		Final Examination	60%
9.	Objectives	<ol style="list-style-type: none"> To develop the student's ability in solving vectors and matrices problems related to engineering applications. To provide the basic knowledge of fields, scalar and vector quantities. To provide fundamental understanding of matrices and their properties. 	
10.	Learning Outcomes	<p>Upon the completion of the unit, the students will be able to:</p> <ol style="list-style-type: none"> Distinguish and interpret vector and scalar quantities. Solve physical problems related to scalar and vector quantities. Determine the results of addition, subtraction, multiplication, adjoin, inverse and transpose of matrices. Solve higher order simultaneous equations using matrices method. 	
11.	Details of subject	Contents	Hours
		Chapter 1: Vector Scalar quantity, Vector quantity, practical examples. Types of vectors. Vector addition, Vector subtraction, multiplication of a vector by a scalar. Unit vectors. Position vector. Zero vector.	6L 2T
		Chapter 2: Fields Scalar field, Physical examples of scalar fields, Vector field, Physical examples of vector fields.	3L 1T
		Chapter 3: Representation of vector Representation of a vector in two dimensional and three dimensional. Addition and subtraction of two-dimensional and three-dimensional vectors.	3L 1T
		Chapter 4: Vectors and Scalar product Scalar product of two and three vectors. The properties of scalar product. Vector product of two and three vectors. The properties of vector product.	6L 2T

		Chapter 5: Introduction to Matrices Definition. Matrices. Different types of matrices. Diagonal matrices. Identity matrices. Square matrix. Transpose matrix.	3L 1T
		Chapter 6: Addition and Subtraction of matrices Matrix addition and subtraction (2×2) Matrix addition and subtraction (3×3) matrix, solving different types of problems.	6L 2T
		Chapter 7: Multiplication of matrices Scalar multiplication. Matrix multiplication (2×2 and 3×3 matrix)	3L 1T
		Chapter 8: Determinants Evaluating determinants. (2×2 and 3×3 matrix). Different types of problems. Solution of simultaneous equations in two and three unknowns via Cramer's rule.	3L 1T
		Chapter 9: Inverse of a matrix Adjoin of a matrix. Inverse of a matrix. Solving different types of problems and transpose. Solution of simultaneous equations in two and three unknowns using determinant method.	9L 3T
		Total	L = 42 hrs T = 14 hrs 56 hours
12.	Main Reference	1. Stroud, K. A. (1998). <i>Engineering Mathematics</i> (4 th ed.). Macmillan Press.	
13.	Additional Reference	1. James, G. (2000). <i>Modern Engineering Mathematics</i> (2 nd ed.). Addison-Wesley. 2. Haeussler, E. F. Jr., Paul, R. S., & Wood, R. (2005). <i>Introductory Mathematical Analysis</i> (11 th ed.). Prentice Hall.	
14.	Practical/Lab Classes	Not applicable	