No	Information of every subject	
1	Unit name:	Engineering Mathematics (VII)
2	Code:	EM-41007
3	Classification:	Supporting Subject
4	Credit value:	4.5
5	Semester/ Year Offered:	1/4
6	Pre-requisite:	
7	Mode of delivery:	Lecture, Tutorial, Oral
8	Assessment system and breakdown of marks: Test	15%
	Mid-term Examination	35%
9	Academic staff teaching unit:	Engineering Mathematics
10	Course Outcomes of unit: In this course, students will be able to • To solve problems on computers or calculators by numeric calculations, resulting in a table of numbers and graphical representations of numeric methods. • To solve Linear systems of equations for fiting straight lines or parabolas and for matrix eigenvalue problems in engineering, statistics and lead to mathematical models • To explain and apply basic methods for the numeric solution of ODEs. • To describe(maximize or minimize) of some function F.	
11	Synopsis of unit: The course introduces students to Numerics in General, Numeric Linear Algebra, Numerics for ODEs and PDEs, Unconstrained Optimization and Linear Programming	
12	Topic: - 19. Numerics in General - Introduction - Solution of Equations by Iteration - Interpolation - Spline Interpolation - Numeric Integration and Differentiation 20. Numeric Linear Algebra - Linear Systems: Gauss Elimination - Linear Systems: LU-Factorization, Matrix Inversion - Linear Systems: Solution by Iteration - Linear Systems: ILL- Conditioning, Norms - Least Squares Method - Matrix Eigenvalues Problems; Introductions - Inclusion of Matrix Eigenvalues - Power Method for Eigenvalues - Tridiagonalization and QR-Factorization	

	21. Numerics for ODEs and PDEs - Methods For First-Order ODEs - Multistep Methods - Methods for Systems and Higher Order ODEs 22. Unconstrained Optimization. Linear Programming - Basic Concepts Unconstrained Optimization: Method of Steepest Descent - Linear Programming - Simplex Methods - Simplex Methods; Difficulties
14	Main references: - Advanced Engineering Mathematics (10^{th} Edition, ERWIN KREYSZIG, Copyright @ 2006 John-Wiley and Sons Inc.
15	Additional references: - http: // www. wiley.com / college / kreyszig/