	School: School of Computer Science Engineering **Department:** CSE **Course:** B.Tech. (CSE)	**Year: I** **Semester: II**	**Subject Name: Mathematics for Computing** **Subject Code: UCS 2005** **L-T-P: 3-1-0** **Prerequisite Subject Name/code:**

Course Outcome (At the end of the course, student will be able Recognize)	Description
CO1	Recognize the concept of differentiation and apply for solving differential equations.
CO2	Recognize the concept of Laplace transform, Inverse Laplace transform. Also solve linear and simultaneous differential equations.
CO3	To known partial differential and types of partial differential equations.
CO4	Recognize the concept of Fourier series.
CO5	Understand the concept of Vector space, subspace and linear transformation.

Detailed Syllabus (Theory)

Unit No.	Topics	CO No.	No. of proposed lectures
Unit-I	**Ordinary Differential Equation of Higher Order:** Linear differential equation of nth order with constant coefficients, Complementary function and Particular integral, Simultaneous linear differential equations, Second order linear differential equations with variable coefficients, Solution by changing independent variable, variation of parameters, Cauchy-Euler equation.	1	8
Unit-II	**Laplace Transform and its Applications** Laplace transform of elementary functions, Properties of Laplace transform, Laplace transforms of derivatives and integrals, Laplace transform of periodic function, Inverse Laplace transform, Convolution theorem, Application to solve simple linear and simultaneous differential equations.	2	8
	Partial Differential Equation	3	8

Unit-III	Origin of partial differential equations, linear and nonlinear partial differential equations of first order, Lagrange's equations, Cauchy's method of characteristics, solution of linear partial differential equations of higher order with constant coefficients, equations reducible to linear partial differentiable equation with constant coefficients.		
Unit-IV	**Fourier Series:** Fourier series, Even and odd function, Euler's formula, Dirchlet's condition, periodic function, trigonometric function, Half range Fourier sine and cosine series.	4	8
Unit-V	**Linear Algebra:** Vector Spaces, subspaces, linear independence and dependence of vectors. Row and Column spaces. Applications to systems of linear equations. Linear Transformation, representation by matrices, rank-nullity theorem, Eigen values, Eigen vectors and their basic properties.	5	8

Text Books:

1. E. Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.

2. B. V. Ramana, Higher Engineering Mathematics, Tata Mc Graw- Hill Publishing Company Ltd.

3. R.K. Jain & S.R.K. Iyenger, Advance Engineering Mathematics, Narosa Publishing

Reference Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.

2. Peter V. O' Neil, Advanced Engineering Mathematics, Thomas (Cengage) Learning.

3. Chandrika Prasad, Advanced Mathematics for Engineers, Prasad Mudranalaya

4. A. C. Srivastava & P. K. Srivastava, Engineering Mathematics, Vol. – II, PHI Learning Pvt. Ltd.

5. Rukmangadachari, Engineering Mathematics – II, Pearson Education.