Branch: B.Sc.(IT)	Semester-II
Subject Code: 2104	Lecture: 04 Credit: 04
Course Opted	Core Course- 6
Subject Title	Mathematics II

Course Objective:

The subject aims to provide the student with:

- Mathematics fundamental necessary to formulate, solve and analyze computer science problems.
- An understanding of Fourier Series and Laplace Transform to solve real world problems.
- An understanding of numerical methods.
- An understanding of Complex integration.

Course Outcomes:

The student will be able to

- Analyze and solve computer science problems
- Understand the applications of Fourier Series and Laplace Transform to solve real world problems
- Apply numerical methods to find solutions of algebraic equations using different methods viz. Bisection method, Regula - Falsi, Newton Raphson's, Ramanujan's method, Matrix Inversion and Gauss Elimination
- Understand Complex Integration

Modules	Sr. No.	Topic and Details	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Vectors** Vectors in two and three dimensions, Vector algebra, Vector function in two and three variables, Vector differentiations, Gradient Divergence and curl, Double and triple integral	12	24
UNIT-II	2	**Fourier series** Definition, Fourier coefficient ,Determination of Fourier series of simple function, Fourier series of even and odd Function	10	20
UNIT-III	3	**Laplace transform** Laplace transform of simple functions, Inverse Laplace transform, application of Laplace transform	10	20
UNIT-IV	4	**Complex Numbers** Complex Numbers and The Complex Plane, Cartesian Polar and Exponential form, Argand's diagram , De Movier's theorem, Function of a complex Variable, Complex integration, Simple example	8	16

	5	**Numerical Methods** **Roots of non-linear equations** a)Bisection Method b)Regula-falsi Method c)Newton-Raphson Method **Direct solution of linear equation** a) Matrix Inversion, b) Gauss-Elimination Method	10	20
Total			50	100

Course Outcomes:
On completion of the course students will be able to

- Solve vectors related problems in computer science domain.
- Solve the problems using Laplace transforms.
- Analyze and solve the problems using Fourier Series.
- Identify and Solve problems using Complex Integration.
- Understand numerical techniques to find the roots of nonlinear equations and solution of system of linear equations.

Text & Reference Books:

- Murray Spiegal, "Vector Analysis", McGraw Hill, 1974.
- P. N. Wartikar & J. N. Wartikar, "Elements of Applied Mathematics", 7th, Pune Vidyarthi Graha, 1988,
- Mathematical methods for Engineer and Science Students by Engle field. Schaun Series, Vector Analysis, Spigel, 2009
- E. Balaguruswamy, Numerical Methods - Tata McGraw Hill Publication
- Grewal. B.S, "Higher Engineering Mathematics", 41 st Edition, Khanna Publications, Delhi, 2011.
- Dass, H.K., and Er. Rajnish Verma," Higher Engineering Mathematics", S. Chand Private Ltd., 2011.
- S.S. Shastri "Introductory methods of numerical analysis" Vol-2, PHI, SECOND edition, 1994