DEPARTMENT OF APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCE

B. Tech. II YEAR (4YDC) COMPUTER SCIENCE ENGINEERING
MA 24003: MATHEMATICS – III

HOURS PER WEEK			CREDITS			MAXIMUM MARKS				
T	P	TU	T	P	TU	THEORY		PRACTICAL		TOTAL MARKS
						CW	END SEM	SW	END SEM	
3	--	1	3	--	1	30	70	--	--	100

PRE –REQUISITES: Mathematics-I and Mathematics-II

COURSE OBJECTIVES

Enable the students to apply the knowledge of Mathematics in various engineering fields by making them

1. understand the concept of partial differential equation with its application.
2. introduce the concept of Fourier series and Fourier transform with their applications.
3. introduce the concept of Laplace Transform and its application in solving ordinary differential equations.
4. understand the basic concept of Number theory.
5. study the basic of mathematical programming technique and their applications.

COURSE OUTCOMES

On completion of the course, students will be able to

CO#1 solve linear homogeneous partial differential equations of nth order and their application.

CO#2 obtain the Fourier series expansion of functions satisfying Dirichlet conditions and the Fourier transform of elementary functions. Also, they learn the application of Fourier transform in solving linear partial differential equations.

CO#3 understand the concept of Laplace transform and its techniques to solve second-order ordinary differential equations involving the Dirac delta (or unit impulse).

CO#4 understand the concept of system of linear congruence's, and its application.

CO#5 solve the problems based on linear and non-linear programming.

COURSE CONTENTS

THEORY

UNIT 1 Partial Differential Equations :Formation of Partial Differential Equations, Partial Differential Equations of first order and first degree i.e., Pp + Qq = R, Linear Homogeneous Partial Differential Equation of nth order with constant coefficient, Separation of Variables, Application to simple problems of vibrations of strings, beam and heat conduction equations.

UNIT 2 Fourier Series and Fourier Transformation :Expansion of functions in a Fourier series, Half range series, Sine and Cosine series and change of interval. Fourier Integral. Fourier Transforms: Sine and Cosine Transforms and their application to solution of Linear Partial Differential Equations.

UNIT 3 Laplace and Z Transforms : Definition of Laplace Transform, Laplace Transform of elementary and periodic functions, properties of Laplace Transform including Laplace Transform of derivatives, Inverse Laplace Transform and its properties, Convolution Theorem, Application of Laplace Transform to Ordinary Differential Equations with constant and variable coefficients, Simultaneous Differential Equations. Z transform and its simple properties.

UNIT 4 Number Theory: Introduction to Number Theory, Basic properties of Number Theory, Divisibility Theory, Theorems based on Divisibility Theory, Congruences, Basic properties of Congruences, Theorems based on Congruences, Applications of Congruences

UNIT 5 Mathematical Programming Techniques: Simplex Method for Maximization and Minimization, Revised Simplex Method and Duality Theorem, Non-Linear Optimization, Kuhn-Tucker condition, Fibonacci Search, Quadratic Interpolation and Combinatorial Optimization.

ASSESSMENT

1. Internal Assessment for continuous evaluation, mid-term tests, tutorials, class performance, etc. (30%).
2. End semester Theory Exam (70%).

TEXT BOOKS RECOMMENDED

1. Ramana B V, Higher Engineering Mathematics, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2006.
2. SwarupKanti, Gupta P.K. and ManMohan, Operations research, S Chand & Sons, Educational publishers, New Delhi, 2004 .
3. Sarkar S. K., A text Book of Discrete Mathematics, S. Chand & Company Ltd. 2016.

REFERENCE BOOKS

1. Kreyszig Erwin., Advanced Engineering Mathematics, 8th edition, John Willy and sons Publications, 1999.
2. Jain, R.K. and Iyengar S.K., Advanced Engineering Mathematics, Narosa Publishing House, New-Delhi, 2006.
3. Pannerselvam R , Operations Research , Prentice Hall of India Pvt. Ltd. , New Delhi , 2004.
4. Das H. K, Higher Engineering Mathematics, S. Chand New Delhi, 2011.