Course Number and Name
BMA301 - MATHEMATICS – III
Credits and Contact Hours
4 & 75
Course Coordinator's Name
Dr.Ramya
Text Books and References

TEXT BOOKS:

1. Kandasamy, P., Thilakavathy, K. and Gunavathy.K. "Engineering Mathematics ", Vol II& III (4th revised edition) S Chand and co. , New Delhi, 2001.

2. Narayanan.S , Manicavachangam pillay ,.T.K., Ramanaiah, G. " Advanced Mathematicsfor Engineering Students ", Vol II & III (2nd Edition), S.Viswanathan (Printers and Publishers Pvt Ltd) 1992.

3. Venkatraman, M.K. " Engineering Mathematics" Vol III – A&B , 13thEdition National Publishing Company , Chennai 2002

Course Description

- To introduce Fourier series analysis this is central to many applications in engineering apart from its use in solving boundary value problems.
- To acquaint the student with Fourier transform techniques used in wide variety of situations.
- To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes
- To develop Z transform techniques for discrete time systems.

Prerequisites	Co-requisites
Mathematics II	NIL
required, elective, or selected elective (as per Table 5-1)	

Course Outcomes (COs)	
CO1	To learn the problem solving methods in linear differential equations
CO2	To learn Dirichlet's condition and operations using Fourier series
CO3	To have a clear understanding about 2nd order equations and wave equations
CO4	Properties of Laplace transform and problem solving using it
CO5	Properties of Fourier transform and problem solving using it

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k	
CO1	M											
CO2		M	H		H							
CO3		M		H								

CO4	H			M							
CO5	H			M	H						

List of Topics Covered

UNIT I   **PARTIAL DIFFERENTIAL EQUATIONS**   **9+6**

Formation – Solution of Standard types of first order equations – Lagrange's equation – Linear partial differential equations of second and higher order with constant coefficients

UNIT II   **FOURIER SERIES**   **9+6**

Dirichlet's conditions – General Fourier series- Half range sine and cosine series – Parse Val's identity – Harmonic analysis

UNIT III   **BOUNDARY VALUE PROBLEMS**   **9+6**

Classification of second order linear partial differential equations – solution of one – dimensional wave equations, one dimensional heat equations.

UNIT IV   **LAPLACE TRANSFORMS**   **9+6**

Transforms of simple functions – basic operational properties – transforms of derivatives and integrals – initial and final value theorems – inverse transforms – convolution theorem – periodic functions – applications of Laplace transforms for solving linear ordinary differential equation up to second order with constant coefficients and simultaneous equations of first order with constant coefficients.

UNIT V   **FOURIER TRANSFORMS**   **9+6**

Statement of Fourier integral theorem – Fourier transform pairs – Fourier sine and cosine transforms – properties – transforms of simple functions – convolution theorem – Parse Val's identity