

22MYB02 – PARTIAL DIFFERENTIAL EQUATIONS AND TRANSFORM TECHNIQUES (Common to AGRI,CIVIL,CHEMICAL, MECH Branches)					
		L	T	P	C
		3	1	0	4
PREREQUISITE : NIL					
Course Objective:		<ul style="list-style-type: none"> To make the conversant with concepts of Laplace transforms, Fourier series, Fourier Transforms to represent periodical physical problems in engineering analysis. To provide adequate knowledge in partial differential equation and to analyze the boundary value problems. 			
Course Outcomes The Student will be able to		Cognitive Level	Weightage of COs in End Semester Examination		
CO1	Apply the various techniques of Fourier series to obtain solution for different functions.	Ap	20%		
CO2	Interpret the methods of partial differential equations in fluid mechanics and water resource management.	Ap	20%		
CO3	Solve the initial and boundary value problems by using Fourier series.	Ap	20%		
CO4	Analyze the concepts of Transform Techniques to solve the problems in stability analysis, Structural Analysis, control system design and analysis.	An	40%		
CO5	Demonstrate the importance of Transform Techniques and partial differential equations in engineering using modern tools.	Ap	Internal Assessment		

UNIT I – FOURIER SERIES	(9+3)
Dirichlet's condition – Fourier series: Half range sine series – Half range cosine series – Parseval's identity for half range series – Root mean square value of a function – Harmonic analysis.	
UNIT II –PARTIAL DIFFERENTIAL EQUATIONS	(9+3)
Formulation of partial differential equations by eliminating arbitrary constants and functions – Solution of standard types first order partial differential equations of the type $f(p,q)=0$, Clairaut's form – Lagrange's linear equations – Linear partial differential equation of second and higher order with constant coefficient of homogeneous types.	
UNIT III –APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS	(9+3)
Classification of second order quasi linear partial differential equations – Solution of one dimensional wave equation (Zero and non-zero velocity) – One dimensional heat equation (Temperature reduced to zero and non zero boundary conditions) – Steady state solution of two dimensional heat equation (Finite and infinite plate).	

UNIT IV --FOURIER TRANSFORM	(9+3)
Fourier integral theorem(Statement only) – Fourier transform pair - Sine and Cosine transforms – Properties -Transforms of simple functions – Convolution theorem – Parseval’s identity(Excluding proof).	
UNIT V –LAPLACE TRANSFORM	(9+3)
Condition for existence - Transforms of Elementary functions –Basic Properties- First & Second Shifting Theorems(Statement only) - Initial and Final value Theorems. Inverse Laplace transforms -Convolution theorem (Excluding proof)- Solution of linear second order ordinary differential equations with constant coefficients using Laplace transform.	
TOTAL (L:45+T:15) : 60 PERIODS	

TEXT BOOKS:
<ol style="list-style-type: none"> 1. Veerarajan.T, "Engineering Mathematics (for semester III), 3rd ed., Tata McGraw Hill, New Delhi. 2. Kandasamy.P, Thilagavathy.K, and Gunavathy.K., "Engineering Mathematics; Volume III", S.Chand&Coltd., 2008. 2. GrewalB.S, "Higher Engineering Mathematics", 42nd ed., Khanna publishers, New Delhi, 2012.
REFERENCES:
<ol style="list-style-type: none"> 1. Goyal Manish and Bali.N.P, "A Text book of Engineering mathematics", 6th ed.,Laxmi Publication (P) Ltd,New Delhi, 2012. 2. Kreyszig, Erwin, "Advanced Engineering Mathematics", 9th ed., Wiley Publications, New Delhi, 2006. Singaravelu.A, "Transforms and Partial Differential Equations", Reprint Edition 2013, Meenakshi Publications, Tamilnadu.

Mapping of COs with POs / PSOs														
COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1		2												
2	3													
3	3													
4	3													
5	3				2				3			3		
CO (W.A)	3	2			2				3			3		

