PESIT Bangalore South Campus

Hosur road, 1km before Electronic City, Bengaluru -100

Department of Basic Science and Humanities

ENGINEERING MATHEMATICS II (17MAT21)– COURSE OUTLINE
(CBCS SCHEME)
JAN2018-MAY 2018

Name of faculty

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Course objectives:

To enable students to apply the knowledge of Mathematics in various engineering fields by making them to learn the following'

- Ordinary differential equations
- Partial differential equations
- Double and triple integration
- Laplace transform

No. of sessions per week: 05 **Total No. of sessions: 50**

Class No.	Portions to be covered	% of portion covered	
		Chapterwise	Cumulative
	Unit – I : Differential equations – 1		
1-2	**Linear differential equations with constant coefficients**	20	20
3	Solutions of second and higher order differential equations.		
4-6	Inverse differential operator method.		
7	method of undetermined coefficients		
8-10	method of variation of parameters		
	Unit – II: Differential equations – 2		
11-12	**Linear differential equations with variable coefficients :** Solution of Cauchy's and Legendre's linear differential equations.	20	40
13-15	**Nonlinear differential equations :** Equations solvable for p, equations.		
16-18	Solvable for y, equations solvable for x, general and singular solutions.		
18-20	Clairauit's equations and equations reducible to Clairauit's form.		
	Unit – III : Partial Differential equations		
21-23	Formulation of PDE by elimination of arbitrary constants/functions, solution of non-homogeneous PDE by direct integration.	20	60
24-26	Solution of homogeneous PDE involving derivative with respect to one independent variable only.		

27-30	Derivation of one dimensional heat and wave equations and their solutions by variable separable method.		
	Unit – IV : Integral Calculus		
31-32	Evaluation of double integrals. Evaluation of triple integrals.	20	80
33-34	Evaluation by changing the order of integration and changing into polar coordinates.		
35-37	Application of double and triple integrals to find area and volume.		
38	Beta and Gamma functions, definitions.		
39-40	Relation between beta and gamma functions and simple problems.		
	Unit –V : Laplace Transform		
41-43	Definition and Laplace transforms of elementary functions. Laplace transforms of $e^{at} f(t), t^n f(t), \frac{f(t)}{t}$ (without proof)	20	100
44-46	Periodic functions, unitstep function and Impulse function – problems.		
47-48	Inverse Laplace Transform - problems, Convolution theorem and problems.		
49-50	Solution of linear differential equations using Laplace Transforms.		

Course outcomes:

1. On completion of this course, students are able to solve differential equations of electrical circuits, forced oscillation of mass spring and elementary heat transfer.
2. Solve partial differential equations fluid mechanics, electromagnetic theory and heat transfer.
3. Evaluate double and triple integrals to find area, volume, mass and moment of inertia of plane and solid region.
4. Use curl and divergence of a vector valued functions in various applications of electr magnetism and fluid flows.
5. Use Laplace transforms to determine general or complete solutions to linear ODE

Reference Books	**Title & Author**
1.	B.S. Grewal, Higher Engineering Mathematics
2.	Erwin Kreyszig, Advanced Engineering Mathematics
3.	B.V. Ramana, Higher Engineering Mathematics
4.	H K Dass, Higher Engineering Mathematics
5.	H C Taneja , Advanced Engineering Mathematics
6.	N P Bali, Higher Engineering Mathematics