Course code: Course Title	Course Structure			Pre-Requisite
	L	T	P	
AM102: Mathematics II	3	1	0	NIL

Course Objective: To impart knowledge of matrices Differential equations, Laplace transform, Fourier series & their applications.

S. NO	Course Outcomes (CO)
CO1	Represent matrices, determinants, and techniques for solving systems of linear equations in the different areas of Linear Algebra, Describe Vector Space and its linear Independence. Solve Eigenvalue problems and apply Cayley Hamilton Theorem.
CO2	Explain the concept of differential equations and evaluate various methods to solve ordinary differential equations.
CO3	Extend the concept of series solutions to solve differential equations and check orthogonality for a given functions.
CO4	Implement the integral transformation using the concept of Laplace transformation and apply it to solve differential equations.
CO5	Solve initial and boundary values problems using Fourier series and Fourier transformations.

S. NO	Contents	Contact Hours
UNIT 1	Linear Algebra: Rank of a matrix, inverse of a matrix using elementary row transformations, solutions of system of linear equations, eigen values and eigen vectors of a matrix.	8
UNIT 2	Ordinary differential equations: Second and higher order linear differential equations with constant coefficients, General solution of homogenous and non-homogenous equations, method of variation of parameters, simultaneous linear differential equations.	9
UNIT 3	Special Functions: Power series method, Frobenious method, Legendre equation, Legendre Polynomials, Bessel equation, Bessel function of first kind and their Orthogonal property.	9
UNIT 4	Laplace Transforms: Basic properties, Laplace transform of derivatives and integrals, Inverse Laplace transform, Differentiation and Integration of Laplace transform, Convolution theorem, Unit step function, periodic function. Applications of Laplace transform to initial and boundary value problems.	8
UNIT 5	Fourier series: Fourier series of 2π period, Fourier series of arbitrary period, Fourier series of Even and odd functions, half range Fourier series, Harmonic analysis.	8
	TOTAL	42

REFERENCES

S.No.	Name of Books/Authors/Publishers	Year of Publication / Reprint
1	Advanced Engineering Mathematics: kreyszig; Wiley-India, 10th edition ISBN- 978-1-119-45592-9	2020
2	Advanced Engineering Mathematics: Jain and lyenger; Narosa, 5th Edition ISBN- 978-81-8487-560-7	2019
3	Advanced Engineering Mathematics: Alan Jeffery; Academic Press ISBN- 978-93-80501-50-5	2010
4	Advanced Engineering Mathematics: Peter V. O'Neil Cengage Learning. ISBN-978-81-315-0310-2	2007
5	Advanced Engineering Mathematics: Dennis G. Zill, Jones and Bartee Publications 6th Ed. ISBN-978-12844105902.	2016

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