Course No. BS-MATH 233 **Title: Engineering Mathematics-III**

Semester: III (New) **Credits 3(2+1)**

Teaching Schedule –Theory with weightages (%)

Lect. No.	Topics to be covered	weightages (%)
Finite Differences and Interpolation		
1-6	Finite differences	17%
	Factorial Notations	
	Various difference operator and their relationship	
	Newton's forward and backward interpolation formula	
	Lagrange's interpolation formulae for unequal intervals	
Numerical Differentiation & Integration		
7-12	First and second order derivative by using Newton's forward and backward interpolation	22%
	Maxima and Minima of tabulated function	
	Numerical Integration: by Trapezoidal rule and by Simpsons rule, applications of Simpson's rule	
Difference Equations and their Applications		
13-17	Difference equation, Order of difference equation, Solution of linear difference equation	15%
	Linear difference equations	
	Rules for finding complementary function	
	Rules for finding particular integral and applications	
Numerical Solution of Ordinary Differential Equations		
18-20	Picard's method	8%
	Taylor's series method	
	Euler's method	
Laplace Transforms		
21-33	Definition, Laplace Transform of elementary functions	38%
	Properties of Laplace Transforms	
	Laplace Transform of periodic function	
	Laplace Transform of derivatives	
	Laplace Transform of an integral	
	Laplace Transform of function multiplied by t^n	
	Laplace Transform of function divided by t	
	Inverse Laplace Transform	
	Convolution Theorem(Without Proof)	
	Applications of LT. Solving ordinary differential equations	
	Solving Simultaneous differential equations using Laplace Transformation.	

Practical Exercise

1. Applications of Interpolation with equal intervals
2. Applications of Interpolation with unequal intervals
3. Applications of Numerical differentiation
4. Applications : Maxima and Minima
5. Applications of Numerical integration
6. Applications of Homogeneous Difference equations
7. Applications of Non-homogeneous Difference equations
8. Applications of Numerical solution of ordinary differential equations-Picard's Method
9. Applications of Taylors method
10. Applications of Numerical solution of ordinary differential equations-Euler's
11. Applications of Runge-Kutta method
12. Applications of Laplace transformations
13. Applications of Inverse Laplace transformation
14. Applications of Convolution theorem
15. Application to solution of ordinary differential equations.
16. Application to solution of simultaneous differential equations

Suggested Reading

Text Book

1. Dr. Shinde K. J. *et.al.* A text book of Agricultural Engineering Mathematics-III

Reference Book

1. Grewal B S. 2015. Higher Engineering Mathematics. Khanna Publishers Delhi.(43rd Edition)