PVP SIDDHARTHA INSTITUTE OF TECHNOLOGY, KANURU, VIJAYAWADA
(AUTONOMOUS)
INFORMATION TECHNOLOGY

TRASFORM TECHNIQUES, NUMERICAL METHODS AND NUMBER THEORY

Course Code	20BS1404	**Year**	II	**Semester**	II
Course Category	BS	**Branch**	IT	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	-
Continuous Internal Evaluation	30	**Semester End Evaluation**	70	**Total Marks**	100

Course Outcomes		
Upon Successful completion of course, the student will be able to		
CO1	Understand the basic concepts of Transform Techniques, Numerical Methods and Number Theory	L2
CO2	Determine Laplace and inverse Laplace transforms of given function & Solving the linear differential Equations using Laplace transforms	L3
CO3	Apply different Numerical methods to solve the problems of numerical integration and ordinary differential equations	L3
CO4	Estimate the interpolated values, approximate roots and derivatives	L4

Contribution of Course Outcomes towards achievement of Program Outcomes Strength of correlations (3-High, 2: Medium, 1:Low)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1													1	
CO2	3								2	2			1	
CO3	3								2	2			1	
CO4		3											1	

Unit No	Contents	Mapped COs
I	**Laplace Transforms:** Definition of Laplace Transform, Transforms of elementary functions, properties of Laplace Transforms, Transforms of derivatives, Transforms of integrals, multiplication by t^n, division by t(All theorems/properties without proofs) **Application**: Evaluation of integrals.	**CO1, CO2**
II	**Inverse Laplace transforms:** Method of partial fractions, other methods of finding inverse Transform, convolution theorem.(All theorems/properties without proofs) **Application**: Solving differential equations using Laplace transforms.	**CO1, CO2**
III	**Solution of Algebraic and Transcendental Equations:** Bisection method, method of false position and Newton-Raphson's method. **Finite differences and Interpolation**: Relation between the operators, interpolation using Newton's forward and backward difference formulae. Interpolation with unequal intervals: Lagrange's formula. (All theorems/properties without proofs)	**CO1, CO3, CO4**
IV	**Numerical Solution of Ordinary differential equations:** Picard's Method, Taylor's Series Method, Euler's Method, modified Euler's Method, Runge-Kutta method of fourth order for solving first order equations. (All theorems/properties without proofs)	**CO1, CO3, CO4**
V	**Basic Concepts in Number Theory:** Divisibility and the Division Algorithm, The Euclidean Algorithm, Modular arithmetic, Prime numbers, Fermat's Theorem and Euler's Theorems, Testing for Primality, Chinese Remainder Theorem. (All theorems without proofs)	**CO1**

Learning Resources

Text Book(s)

1. B.S. Grewal, *Higher Engineering Mathematics*, Khanna Publishers, 44/e, 2019.
2. T.K.V.Iyenger, Krishna Gandhi and others, *Mathematical Methods* by S.Chand.
3. *Cryptography and Network Security- Principles and Practice*, William Stallings, Seventh Edition 2017, Pearson

Reference Book(s)

1. Erwin Kreyszig, *Advanced Engineering Mathematics*, 9/e, John Wiley & Sons, 2006.

e- Resources & other digital material

1. https://www.nptel.ac.in/courses/111/107/111107105/
2. https://nptel.ac.in/courses/106/105/106105162/
3. https://nptel.ac.in/courses/111/106/111106139/
4. IT Moodle