With effect from: 2025-26 (R-23)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with A++ Grade

9-5-81, Ibrahimbagh, Hyderbad-500031

DEPARTMENT OF MATHEMATICS

TRANSFORM TECHNIQUES
(OPEN ELECTIVE)

For B.E., V - Semester – CBCS

(Common to CSE, AIML & IT Branches)

Instruction: 3 Hours per week	**Semester End Exam Marks: 60**	**Subject Reference Code: U23OE510MA**
Credits:3	**Sessional Marks: 40**	**Duration of Semester End Exam: 3 Hours**

COURSE OBJECTIVES	**COURSE OUTCOMES**
The course will enable the students to:	*At the end of the course students will be able to:*
1. ***Understand*** the Definition of Laplace and its Properties.	1. ***Evaluate*** Laplace transforms of functions.
2. ***Understand*** the Definition of inverse Laplace Transforms- Properties	2. ***Evaluate*** Inverse Laplace transforms of functions.
3 ***Understand*** the applications of Laplace Transforms.	3. ***Apply*** Laplace transforms to evaluate integrals and to solve ordinary differential equations arising in engineering problems.
4 ***Study*** the Definition of Z- Transforms and its properties	4. ***Evaluate*** Z- transforms of Sequences
5 ***Understand*** the applications of Z-Transforms	5. ***Apply*** Z-transforms to solve ordinary difference equations arising in engineering problems.

UNIT – I: (8 Hours)

LAPLACE TRANSFORMS

Introduction to Laplace transforms - Existence of Laplace Transform –Properties of Laplace Transform-First shifting theorem - Second shifting theorem -Change of scale property – Differentiation of Laplace transform –Integration of Laplace Transform – Laplace Transform of Derivatives - Laplace Transform of Integrals

UNIT – II: (8 Hours)

INVERSE LAPLACE TRANSFORMS

Introduction to Inverse Laplace transforms -Properties of Inverse Laplace Transform-First shifting theorem - Second shifting theorem -Change of scale property- Multiplication with s - Division by s – Convolution Theorem (without proof).

UNIT – III: (8 Hours)

APPLICATIONS OF LAPLACE TRANSFORMS

Applications of Laplace transforms to Initial and Boundary Value Problems upto second order – Laplace transform of periodic functions – Triangular wave – Square wave – Saw tooth wave.

UNIT – IV: (8 Hours)

Z-TRANSFORMS

Introduction - Z-transforms of Standard sequences - Linearity Property – Scaling Property - Shifting Properties- Initial value theorem - Final value theorem – Differentiation of Z-transform.

UNIT – V: (8 Hours)

INVERSE Z-TRANSFORMS

Introduction –Inverse Z-transforms of Standard functions - Convolution Theorem – Application of Z-Transforms to solve Difference Equations.

Text Books:

1. Advanced Engineering Mathematics, Third Edition, R. K. Jain and S. R. K. Iyengar, Narosa Publishing House.
2. Higher Engineering Mathematics, Dr.B.S Grewal 40th Edition, Khanna Publishers.

Reference Books:

1. Advanced Engineering Mathematics, Kreyszig E, 8 th Edition, John Wiley & Sons Ltd, 2006.
2. A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.

Online Resources:

https://onlinecourses.nptel.ac.in/noc24_ma17/preview

The break-up of CIE : Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	: 2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	: 3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	: 3	Max. Marks for each Quiz Test	:	5
4	Duration of Internal Tests	: 90 Minutes			

Prof.N.Kishan
(OU Nominee)

Prof.M.A.Srinivas
(Subject Expert-JNTUH)

Dr.J Jagan Mohan
(Subject Expert-BITS, Hyd)

Dr.B.Srivathsa
(Industry Expert)

Dr.T. Sudhakar Rao
(Chairman, BOS)