

With effect from the Academic Year 2026-27

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with A++ Grade

9-5-81, Ibrahimbagh, Hyderabad-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: U24OE510MA
Credits:3	Sessional Marks: 40	Duration of Semester End Exam: 3 Hours
COURSE OBJECTIVES		COURSE OUTCOMES
<i>The course will enable the students to:</i>		<i>At the end of the course students will be able to:</i>
1. <i>Understand</i> the Definition of Laplace and its Properties.		1. <i>Evaluate</i> Laplace transforms of functions.
2. <i>Understand</i> the Definition of inverse Laplace Transforms- Properties		2. <i>Evaluate</i> Inverse Laplace transforms of functions.
3. <i>Understand</i> the applications of Laplace Transforms.		3. <i>Apply</i> Laplace transforms to evaluate integrals and to solve ordinary differential equations arising in engineering problems.
4. <i>Study</i> the Definition of Z- Transforms and its properties		4. <i>Evaluate</i> Z- transforms of Sequences
5. <i>Understand</i> the applications of Z- Transforms		5. <i>Apply</i> 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(Retd.))



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

Dr.T. Ramalingeswarara Rao
(Industry Expert)



Dr.T. Sudhakar Rao
(Chairman, BOS)