

Course Code	Course Title	C	H	I	E	T
17U4MSM3	Major Skill Based Elective- III: Fourier Transforms	2	2	25	75	100

Learning Objectives

- To enable the students to study Fourier Transforms and some concepts of infinite Fourier Sine and Cosine transforms, finite Fourier Sine and Cosine transforms and applications to solve some infinite and boundary value problems using finite and infinite transforms.

Learning Outcomes

On satisfying the requirement of this course, students will have the knowledge and skills to

- Calculate the Infinite Fourier transform, Fourier Sine and Cosine transform of elementary functions from the definition.
- Demonstrate their understanding of the shifting theorems, Fourier integral theorems, Inverse Fourier sine and cosine transforms by applying them to appropriate examples.
- Calculate the Finite Fourier cosine and sine transform and apply it in solving boundary value problems.
- Approach more advanced aspects of transform methods.

Unit I Infinite Fourier Transforms

Definition of Infinite Fourier transform – Fourier integral theorem – Inversion theorem for Infinite Fourier transform – Properties of Infinite Fourier transforms – Problems based on these properties – Convolution theorem – Parseval's identity – Problems.

Unit II Infinite Fourier Sine and Cosine transforms

Definition of Infinite Fourier sine and cosine transforms – Inversion formula for Inverse Fourier sine and cosine transforms – Properties – Problems.

Unit III Application of Infinite Fourier transforms

Fourier transform of derivatives – Relation between Fourier transforms and Laplace transforms – Solving Boundary value problems using infinite Fourier Transforms – Problems.

Unit IV Finite Fourier Sine and Cosine Transforms

Definition of finite Fourier Sine and Cosine transforms – Inversion formula for Sine and Cosine transforms – Problems.

Unit V Application of Finite Fourier transforms

Finite Fourier Sine and Cosine transform of derivatives - Solving boundary value problems using Finite Fourier Sine and Cosine transforms – Problems.

Text Book:

1. P. Kandasamy and K. Thilagavathy, Engineering Mathematics Vol. III (Transforms and Partial Differential Equations), Edition 2009, S. Chand & Company Ltd.

Chapter: 4 only.

Reference Books:

1. S. Arumugam, A.ThangapandiIssac and A. Somasundaram, Higher Engineering Mathematics Vol. II , Edition 2010, Scitech Publications.
2. T. Veerarajan, Transforms and Partial Differential Equations (Updated Edition), Third Reprint 2013, McGraw Hill Education (India) Private Ltd.