

UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN MATHEMATICS
SYLLABUS WITH EFFECT FROM 2020-2021

BMA-CSC07

CORE-VII: TRANSFORM TECHNIQUES
(Common to B.Sc. Maths with Computer Applications)

Inst.Hrs : 4

Credits : 4

YEAR: II

SEMESTER: IV

Learning outcomes:

Students will acquire knowledge

- About Laplace Transforms and its inverse
- To apply Laplace transform in solving Ordinary Differential Equations with constant coefficients, simultaneous Ordinary Differential Equations.
- To solve problems in Fourier series and Fourier transforms.

UNIT I:The Laplace Transforms-Definitions-Sufficient conditions for the existence of the Laplace transform(without proof)-Laplace transform of periodic functions-some general theorems-evaluation of integrals using Laplace transform-Problems.

Chapter 5: Section-1 to 5.

UNIT II:The inverse Laplace Transforms- Applications of Laplace Transforms to ordinary differential equations with constant co-efficients and variable co-efficients, simultaneous equations and equations involving integrals-Problems.

Chapter 5: Section-6 to 12.

UNIT III: Fourier series- Expansion of periodic functions of period 2π - Expansion of even and odd functions, Half range Fourier series-Change of intervals –Problems.

Chapter 6: Section-1 to 6.

UNIT IV: Fourier Transform- Infinite Fourier Transform(Complex form) – Properties of Fourier Transform – Fourier cosine and Fourier sine Transform – Properties – Parseval's identity – Convolution theorem - Problems.

Chapter 6: Section-8 to 15.

UNIT V: Z Transforms: Definition of Z-Transform and its properties - Z-Transforms of some basic functions- Examples and simple problems

Chapter 7: Sections -7.1 to 7.3.

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Contents and treatment as in

1. “Calculus-Volume III” – S.Narayananand T.K.ManicavachagamPillai. (Ananda Book Depot)(**for Units I to IV**)
2. “Engineering Mathematics for Semester III- Third Edition – T.Veerarajan (Tata McGraw-Hill Publishing Company Ltd, New Delhi) (**for Unit-V**)

Reference Books

1. Engineering Mathematics Volume III – P.Kandasamy and others (S.Chand and Co.)
2. Advanced Engineering Mathematics- Stanley Grossman and William R.Devit.

Engineering Mathematics III-A.Singaravelu, Meenakshi Agency, Chenani, 2008

e-Resources:

1. <http://mathworld.wolfram.com>.
2. <http://www.sosmath.com>.