



# LAPLACE TRANSFORM

**PROF. INDRAVA ROY**

Department of Mathematics

Institute of Mathematical Sciences

**TYPE OF COURSE** : New | Elective | UG

**COURSE DURATION** : 4 weeks (20 Jul' 20 - 14 Aug' 20)

**EXAM DATE** : 27 Sep 2020

**PRE-REQUISITES** : Differential and integral calculus

**INTENDED AUDIENCE** : Any Interested Learner

**COURSE OUTLINE :**

Laplace transform is a fundamental tool in integral calculus. It is used to solve various types of differential equations, difference equations, integral equations etc., which arise naturally in engineering and basic sciences. Laplace transform techniques are therefore very useful for applications in science and technology.

**ABOUT INSTRUCTOR :**

Prof. Indrava Roy is an Assistant Professor of Mathematics at the Institute of Mathematical Sciences, Chennai.

**COURSE PLAN :**

- Week 1:** Introduction and basic definitions, with brief review of limits and Riemann integration, with special emphasis on improper Riemann integrals
- Week 2:** Functions of exponential order and existence theorem for Laplace transforms- with lots of examples and some non-examples; Properties of Laplace transforms with applications in computing them for various functions
- Week 3:** Inverse Laplace transforms, criteria for uniqueness, computation of inverse Laplace transform via various examples
- Week 4:** Applications of Laplace transform techniques for solving integrals, differential equations, difference equations, integral equations and integro-differential equations