



# GEOSYNTHETICS TESTING LABORATORY

**PROF. J.N. MANDAL**

Department of Civil Engineering  
IIT Bombay

**TYPE OF COURSE** : Rerun | Elective | UG/PG

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

**EXAM DATE** : 27 Sep 2020

**INTENDED AUDIENCE** : B.E, M.E, B.Sc, M.Sc, Ph.D

**PRE-REQUISITES** : Basic Soil Mechanics and Foundation Engineering/ Geotechnical Engineering

**INDUSTRIES APPLICABLE TO** : Larsen & Toubro, Reliance Infrastructure Limited, HCC, TATA Projects, AFCON, RITES LTD, GAMMON INDIA LTD, Simplex Infrastructure, IVRCL

**COURSE OUTLINE :**

This course will show how to conduct the various types of tests used for geosynthetic testing. Each experiment of geosynthetic testing is presented with brief introduction covering the important details of the experiment, the theory and the purpose for which it is to be performed, followed by the detailed explanation of apparatus required, procedure and specimen calculations. These should enable students to compute the results of experiments very easily.

**ABOUT INSTRUCTOR :**

Dr. J.N. Mandal is a professor of Civil engineering at Indian Institute of Technology Bombay in Powai, Mumbai, India. The primary area of research interests include geotechnical and geosynthetics engineering, centrifuge, physical and numerical modeling, ground improvement, waste and nano materials, transportation and environmental geotechnics. He founded geosynthetics research and testing laboratory, offered the undergraduate and postgraduate courses on geosynthetics in 1984. Since then the significance growth of world class research and development has focused completely in the fore front of activities in the emerging area of geosynthetics. He is the author/editor of six books and also founded the International Geosynthetics Society chapter for India in 1988. He organized the first Indian Geotextile Conference in 1988 and chairman for International Conference of Geosynthetics and Geoenvironmental Engineering in 2004.

**COURSE PLAN :**

- Week 01** : Physical Properties: Introduction; Types of Geosynthetics; Functions; Mass per unit area, thickness, specific gravity, Module 2: Mechanical Properties, Tensile strength and trapezoidal tear strength; Tensile Modulus.
- Week 02** : Mechanical Properties : Drop cone test; Puncture resistance; Puncture resistance contd. and burst strength; burst strength contd. and Grab strength; Grab strength contd. and triaxial test.
- Week 03** : Mechanical Properties : Direct Shear and Pull-out test; Pull-out contd.; Sewn seam strength test, Hydraulic Properties Permittivity and transmittivity; transmittivity contd.; Apparent Opening size, Endurance Properties Abrasion test; Ultraviolet degradation and Gradient Ratio, Tests on Geofoam : geofoam introduction.
- Week 04** : Tests on Geofoam : Density of geofoam, Water absorption test, Compressive Properties; Compressive strength contd.; Compressive strength contd., Tensile properties; Tensile Properties contd., Flexural properties, and flammability