



ENGINEERING MECHANICS - STATICS AND DYNAMICS

PROF. ANUBHAB ROY

Department of Applied Mechanics
IIT Madras

TYPE OF COURSE : Rerun | Core | UG

COURSE DURATION : 8 weeks (24 Jan' 22 - 18 Mar' 22)

EXAM DATE : 27 Mar 2022

INTENDED AUDIENCE : Interested Learners

COURSE OUTLINE :

Static and dynamical mechanical systems are the heart of all engineering today. The static systems range from bridges, load bearing members of roofs to fasteners and bolts. Dynamical systems are also ubiquitous in the form of machines which convert electrical energy to mechanical energy. Understanding the equations governing these static and dynamical systems is at the heart of this course. During this course, we will touch upon the theoretical tools that we have available to us in order to be able to analyse these systems. The world around us is full of engineered systems, such as machines, automobiles, bridges and buildings. The objective of this course is to present the basic principles of dynamics and help develop proficiency in applying these principles to formulate and solve dynamics problems. We will also study applications of dynamics concepts to modeling engineered machines.

ABOUT INSTRUCTOR :

Prof. Anubhab Roy - Assistant Professor, Applied Mechanics Research Lab. His research Interests are Microhydrodynamics, Living fluids, Dynamics of swimming cells, Hydrodynamic stability, Geophysical flows, Perturbation methods.

COURSE PLAN :

- Week 1:** Basics of rigid bodies
- Week 2:** Introduction to trusses and joints
- Week 3:** Discussion on beams
- Week 4:** Overview of friction and work & energy
- Week 5:** Plane kinematics
- Week 6:** Plane kinetics
- Week 7:** Work-Energy and Impulse-Momentum methods
- Week 8:** Overview of Vibrations