PROF. K. RAMESH
Department of Applied Mechanics
IIT Madras

TYPE OF COURSE : Rerun I Core I UG
COURSE DURATION : 12 weeks (26 Jul'21 - 15 Oct'21)
EXAM DATE : 23 Oct 2021

PRE-REQUISITES : It is a very basic course
INTENDED AUDIENCE : Any Interested Learners

COURSE OUTLINE :  
This is a basic first level course to learn rigid body mechanics covering both statics and dynamics. Statics covers free body diagrams, equilibrium of rigid bodies, analysis of trusses and beams, discussion on friction, virtual work and stability. Dynamics deals with general plane motion of rigid bodies, use of translating and rotating frames of reference for analysis, plane kinetics and 3D kinematics.

ABOUT INSTRUCTOR :
Prof. K. Ramesh is currently a Senior Professor at the Department of Applied Mechanics, IIT Madras; as its Chairman during (2005-2009) and formerly a Professor at the Department of Mechanical Engineering, IIT Kanpur. He received his undergraduate degree in Mechanical Engineering from the Regional Engineering College, Trichy (now NIT, Trichy), Postgraduate degree from the Indian Institute of Science, Bangalore and the Doctoral Degree from the Indian Institute of Technology Madras.

COURSE PLAN :

Week 1: Introduction and Force Systems
Week 2: Equilibrium of Rigid Bodies and Introduction to Trusses
Week 3: Analysis of Trusses and Introduction to Beams
Week 4: Analysis of Beams
Week 5: Virtual work and Energy relations
Week 6: Review so far and Friction
Week 7: Belt friction, Review of particle dynamics, Circular motion
Week 8: Plane kinematics of rigid bodies, absolute motion and relative motion
Week 9: Instantaneous center, Rotating frame of reference
Week 10: Choice of rotating frame and understanding Coriolis acceleration
Week 11: Plane kinetics
Week 12: 3D kinematics