



# MECHANICS OF HUMAN MOVEMENT

**PROF. SUJATHA SRINIVASAN**

Department of Mechanical Engineering  
IITM

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

**COURSE DURATION** : 12 Weeks (18 Jan' 21 - 09 Apr' 21)

**EXAM DATE** : 25 Apr 2021

**PRE-REQUISITES** : Engineering Mechanics

**INTENDED AUDIENCE** : Students from Engineering, Physiotherapy, Prosthetics & Orthotics can attend this course.

**INDUSTRIES APPLICABLE TO** :

**COURSE OUTLINE** :

This course deals with applying principles of mechanics to movements of the human body. Understanding the biomechanics of human movement is necessary for the prevention and treatment of musculoskeletal injuries and design of aids for rehabilitation. This course will introduce the necessary anatomy, modeling and analysis techniques, and discuss some applications to the design of assistive devices.

**ABOUT INSTRUCTOR** :

Dr. Sujatha Srinivasan graduated with her B.Tech. in Mechanical Engineering from the Indian Institute of Technology (IIT) Madras in 1992, her MSME from the University of Toledo, USA in 1994, and after a long stint in the prosthetics industry, her Ph.D. from the Ohio State University in 2007. Currently, she is an Associate Professor in the Department of Mechanical Engineering and heads the TTK Center for Rehabilitation Research and Device Development (R2D2) at IIT Madras. Her research is in the areas of mechanisms, movement biomechanics and assistive devices.

**COURSE PLAN** :

**Week 1:** Introduction to the musculoskeletal system, joints, movements, terminology

**Week 2:** Skeletal muscles-structure, function, characteristics

**Week 3:** Principles of statics applied to the human body

**Week 4:** Principles of statics applied to the human body - continued

**Week 5:** Principles of statics applied to the human body - continued

**Week 6:** Principles of kinetics applied to the human body

**Week 7:** Principles of kinetics applied to the human body - continued

**Week 8:** Principles of kinetics applied to the human body - continued

**Week 9:** Inverse dynamics analysis, balance

**Week 10:** Introduction to human walking

**Week 11:** Characteristics of normal and pathological gait

**Week 12:** Applications to the design of assistive devices