AM3010 Introduction to Bio mechanics

Full Course Syllabus

1. **Terminologies used in Bio-mechanics**
   Anatomical terminology,motion in the human machine,the standard humanscaling relationships.

2. **Statics of Human Body**
   Review of forces, torques, and equilibrium,motion in one plane and levers,statics in the body,the sense of touch, units of force and pressure.

3. **Motion of Human Body**
   Kinematics and musculature, mechanics of standing,walking, running,jumping, throwing a ball and other types of motions, collisions of the human body, sustained acceleration, physics of sports.

4. **Mechanical Property of the Human Body**
   Material components of the body and their elastic properties, time-independent deviations in hookean materials, static equilibrium of deformable bodies, time-dependent deviations from elastic behavior: viscoelasticity, viscoelasticity in bone, bone fractures, common sports injuries, avoiding fractures and other injuries: materials for helmets.

5. **Study of Muscles**
   Skeletal muscles in the body, the structure of muscles, passive muscles, activating muscles, a macroscopic view, the effect of exercise on muscles and their coordination, active/tetanized muscles, a microscopic view, hill force–velocity curve, the sliding filament model, a nanoscopic view.

6. **Advanced topics**
   Kinematics, Inverse Kinematics, Inverse dynamics, Denavit-Hartenberg convention etc.

Reading Materials (*These books are available in the library****)***

1. Irving P. Herman Physics of the Human Body, Springer, New York, NY, November 2006
2.Susan J.Hall, Basics Bio Mechanics 5th Edition, McGraw - Hill Publishing Co, Newyork, 2007
3. Zatsiorsky, Kinematics of Human Motion, Human Kinetics publishers, 1997
4. Zatsiorsky, Kinetics of Human motion, Human Kinetics publishers, 2002
5. Zatsiorsky and Prilutsky, Biomechanics of Skeletal muscles, 2012
6. Valero-Cuevas, Fundamentals of Neuromechanics, Springer, 2015