

Subject Title : ANATOMY & BIOMECHANIC FOR PHYSICAL ACTIVITY
Subject Code : FIT3201-E
Credit Points : 4.0 (Theory: 2.0 and Practical: 2.0)
Teaching Hours : 4200 Minutes/70 Hours
(Theory: 1400 Minutes and Practical: 2800 Minutes)
Subject Type : Elective
Semester : 3 & 4

Subject Description:

Anatomy & Biomechanics involves the study of anatomy in order to understand basic concepts of human movement and application of various biomechanical principles in the musculoskeletal system. The focus of this subject is to study the various quantitative and qualitative methods of movement. The concept of movement enable the students to understand & analyze the normal movement, and give general guidance / explanation of the body's functional anatomy in various physical activities.

Objective:

The objective of this subject is that students will be able to understand the biomechanics for physical activity. The students are able to understand and to analyze the structure of the movement, the muscular system that is responsible for a particular movement, functional movement and its relationship within biomechanics perspectives.

Subject Content:

1. Essential Topic of Anatomy
 - a. Introduction of Anatomy
 - b. Basic Structure and Function of Human Joints – classification of human joints, axis of rotation, periarticular connectives tissue, bone, & brief overview of joint pathology.
 - c. Muscle: the primary stabilizer and mover of the skeletal system – skeletal stabilizer (muscle morphology, muscle & tendon, muscle torque), skeletal mover, muscle fatigue, changes in muscle with strength training.
 - d. Biomechanical principle – Laws, movement analysis, forces & torque, static analysis, dynamic analysis
2. Kinesiology in Upper Extremity
 - a. Kinesiology of Shoulder Complex – muscle & Joint interaction.
 - b. Kinesiology of Elbow & Forearm – muscle & joint interaction
 - c. Kinesiology of Wrist – muscle & joint interaction
3. Kinesiology in Axial Skeleton
 - a. Axial Skeleton: component within axial skeleton, intervertebral junction, kinematics of vertebral column, sacroiliac joint
 - b. Axial Skeleton: Muscle & Joint Interaction – Innervation of the muscle & joint, biomechanical issues for reducing back injury.
 - c. Kinesiology of Mastication & Ventilation – muscle & joint interaction, muscular actions during ventilation.

4. Kinesiology in Lower Extremity
 - a. Kinesiology of Hip – muscle & joint interaction.
 - b. Kinesiology of Knee – muscle & joint interaction
 - c. Kinesiology of Ankle & Foot – muscle & joint interaction
5. Kinesiology of Walking and running – Joint kinematics, energy expenditures, muscle activity, kinetics.