

Vidyalankar

S.E. Sem. IV [BIOM]
Biomechanics, Prosthetic & Orthotics

SYLLABUS

Time : 3 Hrs.

Theory : 100 Marks
Oral : 25 Marks
Term Work : 25 Marks

Biomechanics :

1. Force system :

Classification of force system. Equilibrium of force system.

2. General principles of Biomechanics :

Analysis of biological sub system from the biomechanical view and rise modeling. Instrumentation.

3. Tissue Biomechanics :

Direct shear, bending and torque actions and the corresponding stresses and strains in biological tissues. Stress relaxation and creep, stability and instability, Biomechanical characterization of bone and the soft connective (skin, tendon, ligaments, etc.) covering structure function, and physiological factors.

4. Movement Biomechanics :

Force analyses in the joints, Gait Analysis, body and limb mass and motion characteristic actions. Forces transmitted by joints. Joint forces results in the normal and disabled human body. Normal and fast gait on the level. Strain and ramp ascent and descent. Joint replacements.

5. Joint analysis :

Instrumentation for gait analysis : Measurement devices—footswitches, instrumented walkway, Motion analysis – interrupted light photography, film/video, VICON, Selspot, Goniometers.

Prosthetics and Orthotics :

6. Principles in designing orthosis and prostheses :

Principles of three point pressure, total contact, partial weight relieving.

7. Positions of anatomical axis :

Positioning and corresponding movements of the body part international conventions with respect to above.

8. Purpose for providing prostheses and orthoses variation aspects regarding diagnosis, prognosis, stature and socio-economic conditions etc.

9. Classification in Prosthetics and Orthotics :

Lower Extremity orthoses and prostheses, Upper Extremity orthoses and prostheses, Spinal orthoses. Recent development in prosthesis and orthotics. Transducers in Prosthetics & Orthotics.

References :

1. Basic Biomechanics (*Susan J. Hall*) MC Graw Hill
2. Human Limbs and their substitutes (*Atlas, C.V.Mosby*)
3. American Atlas of Orthopedics (*Prosthetics, C.V.Mosby*)
4. American Atlas of Orthopedics (*Orthotics, C.V.Mosby*)
5. Biomechanics (*Prof. Ghista*) Private Publication UAE
6. Biomechanics (*White and Puyator*) Private Publication UAE

