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DISCIPLINE SPECIFIC ELECTIVE
(DSE-1A) (Opt any one)
SEMESTER V
BIOMECHANICS

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Max. Marks =100   **BES-E505**
Theory = 70 Marks + Internal Assessment = 30 Marks   Time allowed: 3Hrs

The Course learning outcomes (COs): On completion of the four years B.P.E.S, program, the students will be learning and able to do/perform the following…….
CO-1. Memorizing the Meaning, nature, role and scope of Biomechanics.
CO-2. Explaining the CG, Line of gravity Vectors and Scalars Quantities.
CO-3. Acquiring the knowledge of Linear and Angular Kinematics.
CO-4. Acquiring the knowledge of Linear and Angular Kinetics.
CO-5. Appling the concept of Lever & Equilibrium in game situation.
CO-6. Estimating the role of resistance in sports.

UNIT I - Introduction
Meaning, nature, role and scope of Biomechanics. Centre of gravity -Line of gravity, Vectors and Scalars Quantities.

UNIT II – Linear and Angular Kinematics
Linear- Distance and Displacement
Speed, Velocity and Acceleration
Projectile motion
Angular- Distance and Displacement
Speed, Velocity and Acceleration

UNIT III - Linear and Angular Kinetics
Linear- Inertia, Mass, Force and weight
Newton's law of motion
Pressure, work, Power and energy
Friction, Buoyancy, Spin
Angular- Centripetal force, Centrifugal force, torque and Couple force

UNIT IV – Lever, Stability, Equilibrium-Factors influencing equilibrium - Guiding principles for stability -static and dynamic stability. Meaning of work, power, energy, kinetic energy and potential energy. Leverage -classes of lever - practical application. Water resistance - Air resistance -Aerodynamics.

Note: Laboratory practicals should be designed and arranged for students internally.

References:
Deshpande S.H. (2002). Manav Kriya Vigyan – Kinesiology (Hindi Edition) Amravati: Hanuman Vyayam Prasarak Mandal.
Hoffman S.J. Introduction to Kinesiology (Human Kinesiology publication Inc. 2005
Thomas. (2001). Manual of structural Kinesiology, New York: McGraw Hill.
Uppal, A (2004), Kinesiology in Physical Education and Exercise Science, Delhi Friends publications.
Williams M (1982) Biomechanics of Human Motion, Philadelphia; Saunders Co.