

| Course Code | Course Name | Credits |
|-------------|-------------------------------------|---------|
| 26PE005 | KINESIOLOGY AND BIOMECHANICS | 04 |

Course Objectives

- Introduce key concepts of kinesiology and biomechanics in sports.
- Explain the structure and function of muscles and joints.
- Apply principles of movement and mechanics to physical activities.
- Analyze factors influencing human motion and performance.
- Use biomechanical knowledge to improve sports skills.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

- Understand basic concepts of movement, muscles, and joints.
- Apply biomechanical principles to sports techniques.
- Analyze different types of movements and their effects.
- Evaluate sports performance using biomechanical concepts.
- Develop strategies to enhance efficiency in physical activities

Unit 1-Introduction to kinesiology and sports Biomechanics

Importance of Kinesiology and Biomechanics in sports and physical activities - Origin and Insertion on bones and Action of major Muscles - Types of joints with their structure and functions

Unit 2- MUSCLES AND JOINTS

Joints, Classification of Joints, Construction of synovial joints of the body movement. Origin, Insertion and action of muscles: Pectorals major, Biceps, Triceps (Anterior and Posterior), Trapezius, Sartorius Rectus Femora s, Quadriceps, Hamstring. Types of muscles contraction: isotonic, isometric, Isokinetic.

Unit 3- BASICS OF BIOMECHANICS

Biomechanics in Sports - Mechanical principles, laws of motion, types of Motion, Factors influencing motion, air, gravity and water friction, simple machines - Levers - Types of levers and examples in from the human body . Equilibrium: Meaning, Definition and types. Axes and Planes.

Unit 4- BASICS OF BIOMECHANICS

Biomechanics in Sports - Mechanical principles, laws of motion, types of Motion, Factors influencing motion, air, gravity and water friction, simple machines - Levers - Types of levers and examples in from the human body . Equilibrium: Meaning, Definition and types. Axes and Planes.

Unit 5- BIOMECHANICAL ANALYSIS IN SPORTS

Application of Biomechanics to skill learning

1. Track and Field : Sprint, Shot-put and Long Jump.
2. Games:
 - a. Basketball
 - b. Cricket
 - c. Badminton
 - d. Football

Reference Books:

1. Broor, (2000)Efficiency of Human Movements, London: Saunders & Co.,
- 2.Kelly, D. L. (1999)Kinesiologyand Fundamentals of Motion Description, Prentice Hall.
- 3.McClusg, A. (1989) Human Kinetics and Analysis of Body Movements, London:William Heinmann, 4Sunderarajan, G. S. (1979)Bio-mechanics of Sports and Games, Chennai: Roshan Publication. Neil D.E. (1992)Kinesiology and Anatomy and Motion, London: Mosby and Co.
- 5.BeotraAlka, (2000) Drug Education Handbook on Drug Abuse in Sports: SportsAuthority of India Delhi.
- 6.Clarke, D.H. (1975). Exercise Physiology. New Jersey: Prentice Hall Inc., Englewood Cliffs.
- 7.David, L Costill. (2004). Physiology of Sports and Exercise. Human Kinetics.