

# **BSE215 Sports Biomechanics**

**Level:** 2

**Credit Units:** 5 Credit Units

**Language:** ENGLISH

**Presentation Pattern:** EVERY JAN

## **Synopsis:**

Sports Biomechanics is the study of human movement in sports using the application of mechanics to improve performance or to prevent injury. Mechanics is an area of science concerned with motion of a body and action force of a body. This course basically divided into three parts. The first part focuses on examining the motion of a body. The second part will look into how the action of force on the body. Finally this course also illustrates how biomechanical analyses of sports and exercise are conducted. The findings of such analyses are also discussed to evaluate if performance can be improved or injury can be prevented.

## **Topics:**

- Kinematic concepts for analysing movement - Forms of motion (linear, angular, etc.), anatomical reference and joint movement terminology
- Kinetic concepts for analysing movement
- Analyses of movement - Two-dimensional and three-dimensional motion
- Action of forces in motion - linear kinetic
- Action of forces in motion - angular kinetic
- Action of forces in motion - fluid mechanics
- Equilibrium and movement (equilibrium, centre of gravity, stability, balance, etc.)
- Kinetics effects on movement and injury risks (calculation of mass centre, ground reaction forces for walking, running, jumping, etc.)
- Biomechanical analysis of gait patterns - walking
- Biomechanical analysis of gait patterns - running
- Biomechanical analysis of sport movements - jumping
- Biomechanical analysis of sport movements - throwing

## **Textbooks:**

Hall, S. (2019): Basic Biomechanics. (eISBN:9781260137347) (eText) 8th Edition McGraw  
ISBN-13: 9781260290721

**Learning Outcome:**

- Express concepts and terminology within the area of sports biomechanics.
- Explain how biomechanical factors influence motion in sport and exercise.
- Illustrate the uses of available instrumentation for measuring kinematics quantities.
- Describe the kinetic concepts including inertia, force, torque, and impulse.
- Demonstrate the cause and effect relationship between force and movement.
- Determine the factors of fluid mechanics affecting flotation, drag and movement of a body in medium (e.g., water in swimming).
- Distinguish the mechanical concepts in basic movements such as gaited movement, jumping and throwing.

**Assessment Strategies (Evening Class):**

| <b>Components</b>             | <b>Description</b>        | <b>Weightage Allocation (%)</b> |
|-------------------------------|---------------------------|---------------------------------|
| Overall Continuous Assessment | PRE-CLASS QUIZ 1          | 1.66                            |
|                               | PRE-CLASS QUIZ 2          | 1.67                            |
|                               | PRE-CLASS QUIZ 3          | 1.67                            |
|                               | TUTOR-MARKED ASSIGNMENT 1 | 15                              |
|                               | TUTOR-MARKED ASSIGNMENT 2 | 30                              |
| Overall Examinable Components | Written Exam              | 50                              |
| <b>Total</b>                  |                           | <b>100</b>                      |