

Biomechanics I

Week 1

Quantitative analysis ...

- Instrumentation used to collect numerical data

Qualitative analysis...

- Involves a detailed, systematic and structured observation of a skill or movement pattern

Identifying the source of movement errors can be problematic as they can arise from...

- body position or movement timing
- conditioning
- the way the performer is evaluating environmental cues
- motivational factors

2 areas of biomechanics ...

- kinematics (description of movement)
- kinetics (forces on and within the human body)

Vectors...

- are quantities that have both magnitude and direction
- you can add a positive and a negative vector together

Reference axes (an imaginary axis of rotation that passes through a joint to which it is attached)...

- mediolateral (sagittal), flexion and extension
- anteroposterior (frontal), abduction and adduction
- longitudinal (transverse), internal and external rotation

Planes of Reference...

- sagittal, flexion and extension
- frontal, abduction and adduction
- transverse, internal and external rotation

Which axes define...

- frontal plane (x and z)
- sagittal (x and y)
- transverse (y and z)

Week 2

Magnus Effect

- deviation in the trajectory of a spinning object toward the direction of spin, resulting from the Magnus force (lift force created by spin)

How 3D motion is captured...

- video
- opto-reflective
- inertial sensors
- electromagnetic

Tangents...

- a line that breaks the circumference of a circle in one place and is perpendicular to the radius

Radian...

- the angle subtended at the centre of a circle by an arc equal in length to the radius
- 1 radian = 57.3 degrees

Relative and Absolute Angles

- relative – angle at a joint formed between the longitudinal axes of adjacent body segments
- absolute – angular orientation of a body segment with respect to a fixed line of reference

Direction of action (positive or negative) on the right side of the body...

- adduction (positive)
- abduction (negative)
- flexion (positive)
- extension (negative)
- internal rotation (positive)
- external rotation (negative)