British Columbia Association of Kinesiologists

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SUBJECT NAME: Biomechanics

SUBJECT DESCRIPTION

The subject content focuses on quantitative vector analysis of forces applied to human tissues in residential, occupational, recreation, and sport environments across the lifespan. Skills training includes the measurement, analytical, and computation techniques involving multi-segmental, dynamic analysis of human activity in occupational, clinical, and leisure settings from the perspectives of anthropometry, kinematics, kinetics, energetics, and muscle mechanics.

CONTENT COVERED

- Forces
- Linear Kinematics
- Linear Kinetics
- Work, Power, and Energy
- Torque and Moments of Force
- Angular Kinematics
- Angular Kinetics
- Fluid Mechanics
- Mechanics of Biological Material
- Qualitative Biomechanical Analysis to improve movement technique
- Qualitative Biomechanical Analysis to understand injury development
- Techniques in biomechanical movement analysis
- General Statistics and Data Interpretations

KEY PERFORMANCE INDICATORS (KPIs)

1. Understands and applies the principles of Newtonian mechanics to human movement analysis.
2. Competently evaluates biomechanics research literature related to efficacy of methods, validity of results, and appropriateness of conclusions.
3. Understands how to collect and interpret biomechanical information for use in treatment.
4. Understands, and can explain, human kinematics, including the lever systems of the human body, torque, momentum, angular momentum and fluid mechanics as they relate to activity, movement and the environment.
5. Ability to explain the biomechanical principles (e.g., work, power, energy, force) of human action.
6. Integrates knowledge of the relationship between anatomy and biomechanics and its impact on human movement.
7. Differentiates, explains, and interprets normal and abnormal movement patterns.
8. Applies biomechanical models to human actions.
9. Ability to explain the body's response and adaptation to occupational work.
10. Ability to explain the complex multiple factors that impact biomechanical function in health and disease.
11. Incorporates biomechanical principles in design of customized exercise prescription for individuals including, but not limited to, flexibility, strength, endurance, balance, cardiorespiratory and corrective movement patterning.
12. Ability to describe and incorporate ergonomic risk factors, including force, repetition, contact stress, duration/time, awkward postures, sound (noise) lighting and population anthropometrics in professional practice settings.
13. Recognizes normal and abnormal adaptation of an individual, group or population based on the environment and occupation.
14. Recognizes and analyzes various work environment alterations and accommodations.