Ollscoil
Teicneolaíochta
an Oirdheiscirt

South East
Technological
University

Module Descriptor

Applied Biomechanics (Computing and Mathematics)

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Applied Biomechanics
(A22543)

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Short Title: Applied Biomechanics
Department: Sport and Exercise Science
Credits: 5   **Level:** Advanced

Description of Module / Aims

The aim of this module is to guide students in assessing and critiquing the applications of biomechanics in research and practice. This will also build on their theoretical knowledge through the analysis of current research methodologies and findings.

Programmes

	stage/semester/status
SPRT-0801 BSc (Hons) in Software Systems Development (WD_KDEVP_B)	4 / 8 / E
BSc (Hons) in Sport and Exercise Science (WD_T0012_X)	3 / 6 / M

Indicative Content

- Applications of motion analysis in research and practice
- Applications of force platforms in research and practice
- Applications of EMG in research and practice
- Applications of sensor data (e.g. accelerometers, gyroscopes, GPS)
- Applications of portable data collection (e.g. via phones, smart fabrics etc.)
- Gait analysis (Running and Walking)
- Simulation - forward and inverse dynamics
- Applications of flexibility assessment and movement screening

Learning Outcomes

On successful completion of this module, a student will be able to:

1. Appraise the applications of lab-based biomechanics systems in research and practise
2. Appraise the applications of field-based biomechanics systems in research and practise
3. Prescribe appropriate flexibility/screening assessments for specific population groups
4. Devise an appropriate biomechanical testing protocol to address a specific practical/research issue
5. Explain the findings from a biomechanical testing protocol

Learning and Teaching Methods

- Lectures - incorporating interaction and pre-participation readings
- Tutorials - Research focused - involving analysis and interpretation of scientific journal articles
- Practicals - Hands-on set-up and collection of biomechanics data. Careful attention paid to accuracy and reliability of collection techniques

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	12	
Tutorial	12	
Practical	12	
Independent Learning	99	

Assessment Methods

	Weighting	Outcomes Assessed
Final Written Examination	50%	1,2,3
Continuous Assessment	50%	
Project	50%	4,5

Assessment Criteria

Final Examination (50%)- written paper

Continous assessment (50%) - Presentation of a Research project report involving preparation, planning, execution and analysis of a detailed biomechanical project

Essential Material(s)

- Robertson, D.G., G.E. Caldwell, J. Hamill, G. Kamen and S.N. Whittlesey. *Research Methods in Biomechanics.* 2nd ed. Champaign, IL: Human Kinetics, 2014.

Supplementary Material(s)

- Bartlett, R.M. and M. Bussey. *Sports Biomechanics: Reducing injury risk and improving performance.* 2nd ed. Abingdon, UK: Routledge, 2012.
- Hamill, J. and K.M. Knutzen. *Biomechanical Basis of Human Movement.* 4th ed. Philadelphia, PA: Lippincott, Williams and Wilkins, 2015.
- Payton, C.J. and R.M. Bartlett. *Biomechanical Evaluation of Movement in Sport and Exercise.* Abingdon, UK: Routledge, 2008.

Requested Resources

- Lecture Room: Loose Seated