

2024 / 25

School of Science and Computing

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**SE
TU**

Ollscoil
Teicneolaíochta
an Oirdheiscirt

South East
Technological
University

Module Descriptor

Sport & Exercise Biomechanics 2 (Computing and Mathematics)

Sport & Exercise Biomechanics 2

(A22542)

Short Title: Sport & Exe Biomechanics 2
Department: Sport and Exercise Science
Credits: 5

Level: Intermediate

Description of Module / Aims

The aim of this module is to develop students understanding of the key concepts in sport and exercise biomechanics and also to develop their practical skills in the collection and analysis of human movement data.

Programmes

stage/semester/status		
SPRT-0701	BSc (Hons) in Software Systems Development (WD_KDEVP_B)	4 / 7 / E
	BSc (Hons) in Sport and Exercise Science (WD_T0012_X)	3 / 5 / M

Indicative Content

- Three dimensional kinematics - linear and angular
- Three dimensional kinetics - linear and angular
- Power, force-velocity relationship
- Quantitative analysis of human movement
- Systematic qualitative analysis of human movement (including deterministic models of performance, prioritisation, cueing etc.)
- Biomechanics of specific skills/sports (e.g. long jump, throwing, kicking etc.)
- Advanced analysis of human movement data (e.g filtering, interpolation, normalisation)
- Practical aspects of biomechanics testing equipment (e.g. motion analysis, EMG, force platforms, GPS etc.)
- Muscle mechanics

Learning Outcomes

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

1. Describe the principle biomechanical concepts underpinning movement in sport
2. Perform advanced calculations relating to kinematic and kinetic quantities
3. Compare the practical benefits and limitations of equipment used during biomechanical testing
4. Organise the collection of biomechanical data of a sports or exercise movement
5. Complete detailed analyses of human movement

Learning and Teaching Methods

- Lectures - incorporating interaction and engagement with prior reading
- Practicals - providing skills for self-directed data collection and project completion
- Tutorials - task-based and problem-based learning

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%	
In-Class Assessment	10%	1,2,3
Project	40%	4,5

Assessment Criteria

Final Examination - written paper

Mid-term in-class exam (10%)

Project - individual scientific project assessing planning, data collection, analysis and report preparation skills

Essential Material(s)

- McGinnis, P.M. *Biomechanics of Sport and Exercise*. 3rd ed. Champaign, IL: Human Kinetics, 2013.

Supplementary Material(s)

- Hamill, J. and K.M. Knutzen. *Biomechanical Basis of Human Movement*. 4th ed. Philadelphia, PA: Lippincott, Williams and Wilkins, 2015.
- Knudson, D. *Fundamentals of Biomechanics*. USA: Springer, 2007.
- Knudson, D. *Qualitative Diagnosis of Human Movement*. Human Kinetics: 3rd ed, 2013.
- Winter, D.A. *Biomechanics and Motor Control of Human Movement*. 4th ed.. UK: Wiley, 2009.

Requested Resources

- Room Type: Computer Lab