1. **Title of the module**

SPOR3270 (SS327) Introduction to Biomechanics

1. **School or partner institution which will be responsible for management of the module**

School of Sport and Exercise Sciences

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

Level 4

1. **The number of credits and the ECTS value which the module represents**

15 credits (7.5 ECTS)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Spring

1. **Prerequisite and co-requisite modules**

None

1. **The programmes of study to which the module contributes**

BSc (Hons) Sport and Exercise Science

1. **The intended subject specific learning outcomes.  
   On successfully completing the module students will be able to:**
   1. Define basic biomechanical terms including: kinematic terms such as velocity and acceleration, force, mass, work, energy.
   2. Apply Newton’s Laws and the impulse-change in momentum relationship to basic two dimensional whole body movement.
   3. Use basic trigonometric and algebraic techniques to manipulate and solve equations of uniform acceleration.
   4. Describe the effect of air resistance on performance in sports such as cycling and tennis.
2. **The intended generic learning outcomes.  
   On successfully completing the module students will be able to:**
   1. Apply knowledge to the solution of familiar and unfamiliar problems – evidenced via the selection and solution of appropriate equations to gain insight into human movement principles.
   2. Apply communication, presentation, numeracy and IT skills – evidenced via the completion of calculations in seminars and assessments, the use of computer software to aid in the collection and processing of biomechanical data, and the interpretation in worksheets and assessments of this data.
   3. Apply interactive group skills – evidenced via the collection and analysis of biomechanical data in groups for coursework assessment
   4. Apply problem solving skills – evidenced via the completion of calculations and data analysis.
   5. Self-appraise and reflect on practice - achieved through the completion of formative online quizzes and in-class exercises.
   6. Plan and manage learning – through completing the extra self-directed study and optional online exercises necessary to successfully complete the required assignments and tasks throughout the module.
3. **A synopsis of the curriculum**

The module aims to provide students with a basic understanding of mechanical principles and their applications to sports performance and human movement in general. We will work by specifying a question about an aspect of sports performance, and then examining the mechanical principles that allow us to answer this question.

Indicative content includes:

* Definition and computation of kinematic quantities: position, displacement, velocity and acceleration.
* Vector and scalar quantities.
* Newton's Laws of linear motion.
* Impulse-change in momentum relationship.
* Projectile motion.
* Basic fluid mechanics.
* Searching and reading the biomechanics literature.

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**

Hamill, J. and Knutzen, K.M. (2009) Biomechanical basis of human movement. 3rd Ed. London: Lippincott Williams and Wilkins.

Hay, J.G. (1993) The biomechanics of sports techniques. 4th Ed. Englewood Cliffs NJ: Prentice-Hall.

McGinnis, P. (2005) Biomechanics of sport and exercise. 2nd Ed. Champaign, IL: Human Kinetics.

Nordin, M. and Frankel, V. H. (2001) Basic biomechanics of the musculoskeletal system. 3rd Ed. London: Lippincott Williams & Wilkins.

Nigg, B. and Herzog, W. (2007). Biomechanics of the Musculoskeletal System. 3rd Ed. Chichester: Wiley & Son.

Winter, D. A. (2009) Biomechanics and Motor Control of Human Movement. 4th Ed. Chichester: Wiley & Son

1. **Learning and teaching methods**

Total contact hours: 22

Private study hours: 128

Total study hours: 150

1. **Assessment methods**
   1. Main assessment methods

Online Quiz 1 – 15%

Written Worksheet – 40%

Online Quiz 2 - 15%

Online Quiz 3 - 15%

Online Quiz 4 - 15%

13.2 Reassessment methods

100% coursework

1. ***Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section 12) and methods of assessment (section 13)***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | *8.1* | *8.2* | *8.3* | *8.4* | *9.1* | *9.2* | *9.3* | *9.4* | *9.5* | *9.5* | *9.6* |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| **Lectures** | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| *Seminars* | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |
| *Online quizzes* | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| *Worksheet* | **x** | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |

1. **Inclusive module design**

The School recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Medway

1. **Internationalisation**

This module has been designed with reference to educational standards published or recommended by the International Society of Biomechanics and the American Society of Sports Medicine.

**FACULTIES SUPPORT OFFICE USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

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| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
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Revised FSO Feb 2018