



Course Outline (Higher Education)

School:	School of Science, Psychology and Sport
Course Title:	BIOMECHANICS IN PHYSICAL EDUCATION
Course ID:	EXSCI2000
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	69903

Description of the Course :

This course enables students to develop an understanding of the nature of efficient human movement, based on principles of biomechanics. Content: linear and angular kinematics, linear and angular kinetics, fluid mechanics, qualitative analysis of sports techniques and the application of biomechanical principles to fundamental movements, sports techniques, recreational and exercise movement activities. In addition, students will be exposed to a variety of teaching and learning activities and strategies that can be implemented when teaching fundamental biomechanical principles in Senior Physical Education.

Grade Scheme: Graded (HD, D, C, etc.)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Introductory	■	■	✓	■	■	■

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Intermediate	■	■	■	■	■	■
Advanced	■	■	■	■	■	■

Learning Outcomes:

Knowledge:

- K1.** Explain the role of biomechanics in human movement and discuss how the discipline has contributed to advancements in technology and improvements in performance.
- K2.** Summarise the differences between linear and angular kinematics and kinetics using examples from human movement.
- K3.** Understand, explain and apply Newton's three laws of motion.
- K4.** Discuss the effects various fluid forces have on an object and how these forces can be manipulated to increase or decrease performance in specific sports.
- K5.** Identify the mechanical properties of muscles and the effects of loading in human movement and sport specific skills have on the muscle.

Skills:

- S1.** Critically evaluate and identify the key biomechanical principles associated with a variety of sports settings.
- S2.** Use a range of communication methods and/or technologies, to develop and implement meaningful collaborative and independent learning and study strategies for new material.

Application of knowledge and skills:

- A1.** Communicate findings from sport related biomechanical principle assessment task to the other students in the laboratory setting.
- A2.** Participate in problem solving of biomechanical issues within laboratories.
- A3.** Develop teaching and learning activities that will be valuable when teaching key biomechanical concepts to VCE students.

Course Content:

Topics may include:

- Introduction to biomechanics and its applications
- Forces
- Linear and angular motion, including Newton's Laws
- Projectile motion
- Work, power & energy

- Coefficient of restitution
- Levers & torque
- Centre of gravity
- Fluid mechanics
- Muscle mechanics
- Qualitative biomechanical analysis of human movement
- Use and advancements in biomechanical technology

Values:

- V1.** Recognise and appreciate the complexity of the mechanics of the body in all human movement settings.
- V2.** Recognise the need for critical thinking, collaborative discussion and reflection to fully appreciate the role of biomechanics in performance.

Graduate Attributes

The Federation University FedUni graduate attributes (GA) are entrenched in the Higher Education Graduate Attributes Policy (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course			
		Learning Outcomes (KSA)	Code A. Direct B. Indirect N/A Not addressed	Assessment task (AT#)	Code A. Certain B. Likely C. Possible N/A Not likely
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K3, K5, S1, A2, A3	A, A, A, B, A	AT1, AT2, AT3, AT4	A, B
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	S2, A1, A3	B, B, A	AT1, AT3	A, B

Graduate attribute and descriptor		Development and acquisition of GAs in the course			
		Learning Outcomes (KSA)	Code A. Direct B. Indirect N/A Not addressed	Assessment task (AT#)	Code A. Certain B. Likely C. Possible N/A Not likely
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	N/A	N/A	N/A	N/A
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	S2, A3	B, A	AT3	A, B
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	S1, S2, A1, A2, A3	B, A, B, B, A	AT1, AT3	B, C

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1-K5; A2-A3; S1	Participation in practical sessions.	At least 90% attendance and participation in practical sessions	S/U
K1-K3; S2	Completion of self-directed study of class content presented in the lectures and labs from week 1-5 in a variety of sports and human movement settings.	Mid semester test	15-30%
K2-K5; S1-S2; A1-A3	Apply relevant biomechanical principles to a variety of sports settings, and communicate this information to classmates in the laboratory setting.	Sport related biomechanical principle assessment task.	20-40%
K1-K5; S1-S2	Review of biomechanical principles presented in the lectures and labs from the entire course to a variety of sports and human movement settings.	Final examination.	40-60%

Adopted Reference Style:

APA