



Unit Outline (Higher Education)

Institute / School:	Institute of Health and Wellbeing
Unit Title:	INTRODUCTION TO BIOMECHANICS
Unit ID:	EXSCI1701
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	069903

Description of the Unit:

This unit introduces students to key biomechanical concepts and terminology, with a focus on understanding the application of biomechanical principles to fundamental movements, sports techniques, recreational and exercise movement activities. This unit includes the examination of linear and angular kinematics and kinetics; fluid mechanics; and some biomechanical analysis techniques.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

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 Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory			✓			

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Intermediate	■	■	■	■	■	■
Advanced	■	■	■	■	■	■

Learning Outcomes:

Knowledge:

- K1.** Describe the scope of scientific inquiry addressed by biomechanics and discuss how the discipline has contributed to advances in technology and improvements in performance.
- K2.** Identify and describe the planes and axes of motion associated with the human body.
- K3.** Appraise the differences between linear and angular kinematics and kinetics, using examples from human movement.
- K4.** Explain and apply Newtons laws of linear and angular motion, and gravitation.
- K5.** Discuss the effects various forces have on an object and how these forces can be manipulated in specific sports and/or human movements.
- K6.** Explain the term centre of gravity and the relationship between factors including centre of gravity, base of support, balance and stability.
- K7.** Identify the mechanical advantages associated with different types of levers and explain the concept of leverage within the human body.

Skills:

- S1.** Represent external forces using free body diagrams.
- S2.** Solve quantitative and qualitative biomechanical problems.
- S3.** Examine and critically evaluate the key biomechanical principles associated with a variety of sports settings, and communicate this information to peers.

Application of knowledge and skills:

- A1.** Participate in problem solving of biomechanical scenarios within laboratories.
- A2.** Apply the principles of biomechanical analysis of human movement in the context of exercise and activities of daily living.
- A3.** Apply biomechanical principles when conducting a qualitative and/or quantitative analysis of human movement.

Unit Content:

The following topics will be covered as principles and applied to a variety of sports and human movement contexts:

- Introduction to biomechanics and its applications;
- Forces;
- Linear and angular motion, including Newtons Laws;
- Projectile motion;
- Work, power & energy;
- Coefficient of restitution;
- Levers & torque;
- Centre of gravity;
- Fluid mechanics;

- Qualitative biomechanical analysis of human movement;
- Use and advancements in biomechanical technology.

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
S1-S3; A1-A3	Attendance and participation in laboratory sessions to complete formative assessments of practical skills.	90% attendance required to satisfy ongoing formative assessments	Satisfactory/Unsatisfactory
K1-K4; S1-S2.	Completion of self-directed study of class content presented in the first half of the semester.	Mid-semester exam	20-40%
K3-K7; S3; A2-A3.	Describe key biomechanical principles making links to sport and human movements, and/or activities of daily living and communicate this information via a group poster and presentation.	Laboratory project	20-40%
K1-K7; S1-S2.	Review of biomechanical principles presented in the entire unit to sports and human movement settings.	Final theory exam	40-60%

Adopted Reference Style:

APA

Refer to the [library website](#) for more information

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