ESSC12004 *Exercise and Sport Biomechanics*
Term 1 - 2018

Profile information current as at 10/04/2024 01:53 pm

General Information

Overview
This unit is designed so that students should be able to explain the fundamental concepts of mechanics that are applicable to the study of human motion. Students will be introduced to basic principles of mechanics to assess and analyse human motion as it relates to the musculoskeletal system. This unit will introduce basic biomechanical equipment and measurement techniques to devise safe and effective fitness programs, improve athletes' performance, recognise and correct improper technique during physical activity, prevent injuries and regain physical fitness after injury. Note: All flexible enrolled students are required to attend a compulsory Exercise and Sport Biomechanics residential school to promote development of unit learning outcomes.

Details
Career Level: *Undergraduate*
Unit Level: *Level 2*
Credit Points: *6*
Student Contribution Band: *10*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites
BMSC11002 Human Body Systems 2 OR BIOH11005 Introductory Anatomy and Physiology AND ESSC11003 Skill Acquisition and Movement
Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the Assessment Policy and Procedure (Higher Education Coursework).

Offerings For Term 1 - 2018

- Distance
- Mackay
- Rockhampton

Attendance Requirements
All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Residential Schools
This unit has a Compulsory Residential School for distance mode students and the details are:
Click here to see your Residential School Timetable.

Website
This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

Regional Campuses
Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

Metropolitan Campuses
Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Online Quiz(zes)**
Weighting: 25%
2. **Written Assessment**
Weighting: 35%
3. **On-campus Activity**
Weighting: Pass/Fail
4. **Examination**
Weighting: 40%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the University's Grades and Results Policy for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the CQUniversity Policy site.
You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the CQUniversity Policy site.

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Student Feedback via Have Your Say and email

Feedback

Thorough breakdown and explanation of the mathematics problems through lectures and responses to student queries were appreciated by students.

Recommendation

Continue to provide the thorough breakdown of problems and timely responses to student.

Feedback from Student Feedback via Have Your Say and email

Feedback

Issues with residential school and laboratory activities related to the types of activities and allocated time to complete tasks were identified.

Recommendation

A review of the laboratory component of the unit to be undertaken prior to the next offering to ensure adequate time is provided to complete tasks. However, some issues identified were due to rescheduling of residential school and laboratory activities due to unforeseen circumstances.

Feedback from Self-reflection/Peer review

Feedback

Unit needs less emphasis on quantitative aspect of biomechanical analysis.

Recommendation

Biomechanics does heavily rely on maths and physics and the unit will continue to have a focus on quantitative analysis. However, a review of assessment items and unit content will be undertaken prior to next offering to further emphasis the applied and qualitative aspects of biomechanical analysis and to integrate this information with the quantitative mathematical analyses.

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Explain the fundamental concepts of mechanics that are applicable to the study of human motion
2. Describe the significance and limitations imposed on the musculo-skeletal system by mechanical laws
3. Apply basic principles of mechanics to evaluate real-world biomechanical problems
4. Employ basic biomechanical equipment and measurement techniques to acquire and analyse data
5. Appraise the use of current biomechanical techniques, equipment, and training in the optimisation of human performance

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level ◦ Introductory Level • Intermediate Level • Graduate Level ◦ Professional Level ◦ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Online Quiz(zes) - 25%	•				•

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
2 - Written Assessment - 35%	•	•	•	•	•
3 - Examination - 40%	•		•		
4 - On-campus Activity - 0%				•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
1 - Communication	•				•
2 - Problem Solving	•		•		
3 - Critical Thinking			•		
4 - Information Literacy		•			
5 - Team Work					•
6 - Information Technology Competence				•	
7 - Cross Cultural Competence	•				
8 - Ethical practice					
9 - Social Innovation					
10 - Aboriginal and Torres Strait Islander Cultures					

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Online Quiz(zes) - 25%		•	•			•				
2 - Written Assessment - 35%	•	•		•		•				
3 - Examination - 40%	•	•								
4 - On-campus Activity - 0%	•	•	•	•	•	•		•		

Textbooks and Resources

Textbooks

ESSC12004

Prescribed

Basic Biomechanics
Edition: 7th (2015)
Authors: Susan Hall
McGraw-Hill Education
New York , New York , USA
ISBN: 978-0-07-352276-0
Binding: Paperback

View textbooks at the CQUniversity Bookshop

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- CG85 Program Portal (Moodle)
- PC/Mac computer with Microsoft Office (or equivalent) software
- 2D motion analysis software such as Kinovea - see Moodle for other software options

Referencing Style

All submissions for this unit must use the referencing style: American Psychological Association 6th Edition (APA 6th edition)
For further information, see the Assessment Tasks.

Teaching Contacts

Crystal Kean Unit Coordinator
c.kean@cqu.edu.au

Schedule

Week 1 - 05 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
What is Biomechanics? Introduction to Basic Biomechanics Concepts	Main Chapters: 1, 2, and 3	

Week 2 - 12 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
Linear Kinematics	Main Chapters: 2 and 10	

Week 3 - 19 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
Linear Kinetics I	Main Chapters: 3 and 12	

Week 4 - 26 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
Linear Kinetics II	Main Chapters: 3 and 12	

Week 5 - 02 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Angular Kinematics	Main Chapters: 2 and 11	

Vacation Week - 09 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 16 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Angular Kinetics I	Main Chapters: 3 and 13	**Mid-Term Quiz** Due: Week 6 Friday (20 Apr 2018) 5:00 pm AEST

Week 7 - 23 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Angular Kinetics II	Main Chapters: 3 and 14	

Week 8 - 30 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Muscle Mechanics	Main Chapter: 6 Supplementary Chapters: 7, 8, 9, and online readings	

Week 9 - 07 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Bone Mechanics	Main Chapters: 4 and 5 Supplementary Chapters: 7, 8, 9, and online readings	

Week 10 - 14 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Gait and Movement Analysis	Online readings	

Week 11 - 21 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Fluid Mechanics	Main Chapter: 15	

Week 12 - 28 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Review		**Laboratory Workbook** Due: Week 12 Wednesday (30 May 2018) 5:00 pm AEST

Review/Exam Week - 04 Jun 2018

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 11 Jun 2018

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

In order to pass this unit, you must attain at least 50% overall.
Laboratory / Residential School Information
Mixed Mode students: A residential school will take place during Week 7, on the Rockhampton North campus. Attendance at this residential school is compulsory and you cannot pass the unit without attending the residential school.
Rockhampton students: Laboratory sessions will be held in Weeks 2, 3, 4, 6, 8, and 10 on Rockhampton North campus. Attendance at all six (6) laboratory sessions is compulsory and you cannot pass the unit without attending these sessions.
Mackay students: Laboratory sessions will be run in two blocks during Week 5 and 9 on the Mackay City campus. Attendance at these two (2) laboratory blocks is compulsory and you cannot pass the unit without attending these blocks.

Assessment Tasks

1 Mid-Term Quiz

Assessment Type
Online Quiz(zes)

Task Description
You will complete one (1) online quiz. The quiz will be based on biomechanical content from lectures, textbook chapters, and other readings covered in Weeks 1 to 5 (inclusive). You may be required to complete some calculations. Therefore, when completing the quiz it is recommended you have access to a calculator.
The quiz will open on Friday of Week 5 at 5:00pm AEST and closes Friday of Week 6 at 5:00pm AEST. You must log into Moodle during this time period to complete the quiz.
You will have 60-minutes to complete the quiz, which consists of 40 multiple choice questions.You can only attempt the quiz once and you must complete it within a single session. You cannot save your answers and return to the quiz at a later time.
NOTE: In the absence of an approved extension, there will be no late submissions allowed for this assessment item.

Number of Quizzes
1

Frequency of Quizzes

Assessment Due Date
Week 6 Friday (20 Apr 2018) 5:00 pm AEST
It is your responsibility to log onto Moodle and complete the quiz within the given time period

Return Date to Students
Week 6 Friday (20 Apr 2018)
Grade will be available on completion of quiz. Further feedback will be available at the end of Week 6, upon closing of the quiz.

Weighting
25%

Assessment Criteria
This quiz will assess your knowledge of concepts covered in Week 1 to 5 (inclusive).
Each question of the quiz will be graded as correct or incorrect and an overall grade out of 25 will be determined.

Referencing Style

- American Psychological Association 6th Edition (APA 6th edition)

Submission
Online

Learning Outcomes Assessed

- Explain the fundamental concepts of mechanics that are applicable to the study of human motion
- Appraise the use of current biomechanical techniques, equipment, and training in the optimisation of human performance

Graduate Attributes

- Problem Solving
- Critical Thinking
- Information Technology Competence

2 Laboratory Workbook

Assessment Type
Written Assessment

Task Description
Throughout the term you will complete a number of practical activities related to concepts of linear kinematics and kinetics, angular kinematics and kinetics, muscle mechanics, and 3-dimensional motion analysis. The practical activities will involve applying these concepts to a variety of exercise and sports scenarios. Some of these practical activities will be completed on-campus during laboratory/residential school sessions while other practical activities will be completed off-campus in your own time.
For this assessment item, you will be required to complete a laboratory workbook which involves collecting, analysing, and interpreting the data from each activity to answer a series of questions. These questions will include completing results tables, performing calculations, creating graphs, summarising results, comparing and contrasting results, making recommendations to improve performance, and discussing results in relation to scientific evidence and biomechancial concepts.
Questions will be based on the following practical activities:

- Laboratory 1: Linear Kinematics
- Laboratory 2: Linear Kinetics
- Laboratory 3: Qualitative Movement Analysis
- Laboratory 4: Angular Kinematics (off-campus activity)
- Laboratory 5: Angular Kinetics
- Laboratory 6: Muscle Mechanics
- Laboratory 7: 3-Dimensional Movement Analysis

A copy of the Laboratory Workbook will be available on Moodle.

Assessment Due Date
Week 12 Wednesday (30 May 2018) 5:00 pm AEST

Return Date to Students
Exam Week Wednesday (13 June 2018)

Weighting
35%

Assessment Criteria
The Laboratory Workbook questions are designed to evaluate your ability to collect biomechanical data and apply knowledge to interpret findings. You will receive weighted marks for work completed on each question based on correct responses, correct use of terminology, clear presentation of graphical information and written interpretation of results, and the use of references (where required).

Referencing Style

- American Psychological Association 6th Edition (APA 6th edition)

Submission
Online

Submission Instructions
You are required to submit the Laboratory Workbook as a .doc or .docx file via the unit Moodle site. All submissions are to be complete individually.

Learning Outcomes Assessed

- Explain the fundamental concepts of mechanics that are applicable to the study of human motion
- Describe the significance and limitations imposed on the musculo-skeletal system by mechanical laws
- Apply basic principles of mechanics to evaluate real-world biomechanical problems
- Employ basic biomechanical equipment and measurement techniques to acquire and analyse data
- Appraise the use of current biomechanical techniques, equipment, and training in the optimisation of human performance

Graduate Attributes

- Communication
- Problem Solving
- Information Literacy
- Information Technology Competence

3 On-campus Activity

Assessment Type
On-campus Activity

Task Description
This assessment involves compulsory attendance to all laboratory sessions of the unit. You are required to attend (and actively participate in) the on-campus laboratories held throughout the term (on Rockhampton North or Mackay City campuses), or during the residential school block.

Assessment Due Date

At compulsory on-campus laboratory sessions and/or residential school as scheduled.

Return Date to Students
Review/Exam Week Friday (8 June 2018)
Final grading will be available at end of term upon completion of unit on-campus activities.

Weighting
Pass/Fail

Minimum mark or grade
Pass

Assessment Criteria
This assessment item is based on Pass/Fail grading. If you attend and actively participate in all laboratory sessions you will pass this assessment piece. If you fail to attend any of the on-campus laboratory sessions (or residential school) you will fail this assessment piece.

Referencing Style

- American Psychological Association 6th Edition (APA 6th edition)

Submission
Offline

Submission Instructions
No documentation is required to be submitted. You will be required to sign attendance sheets for each laboratory session.

Learning Outcomes Assessed

- Employ basic biomechanical equipment and measurement techniques to acquire and analyse data
- Appraise the use of current biomechanical techniques, equipment, and training in the optimisation of human performance

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence
- Ethical practice

Examination

Outline
Complete an invigilated examination.

Date
During the examination period at a CQUniversity examination centre.

Weighting
40%

Length
120 minutes

Exam Conditions
Closed Book.

Materials
Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).
Calculator - non-programmable, no text retrieval, silent only

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the **Student Academic Integrity Policy and Procedure**. This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?
A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?
A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?
For academic advice and guidance, the Academic Learning Centre (ALC) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?

Be Honest
If your assessment task is done by someone else, it would be dishonest of you to claim it as your own

Seek Help
If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)

Produce Original Work
Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem