MEDI11002 *Physics for Health Sciences*
Term 3 - 2021

Profile information current as at 24/04/2024 02:16 am

General Information

Overview
This unit creates the foundations for an understanding of physics as it applies to our world around us, our bodies and our clinical environments. You will learn how to explain observed phenomena, predict changing behaviour and communicate using science conventions. You will apply problem-solving skills and knowledge of physics to find reasonable solutions to both word- and numerical-based situations.

Details
Career Level: *Undergraduate*
Unit Level: *Level 1*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites
There are no requisites for this unit.
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 3 - 2021

- Online

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).

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. **Written Assessment**
Weighting: 15%
2. **Written Assessment**
Weighting: 25%
3. **Online Test**
Weighting: 60%

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 informal communications, instructor reflection

Feedback

The final test has been provided as a Word document for students to complete offline and upload by the due date/time. While it does have the advantage of using Turnitin to check originality, there are disadvantages. Some students did not read instructions regarding the need to submit by the deadline.

Recommendation

Administer the final online test as a Moodle quiz.

Feedback from Student Have Your Say feedback, instructor reflections

Feedback

The two written assignments are intended to provide students opportunities to get feedback on the response writing in advance of the final test. Student feedback indicates that most students found both the assessment task and the assessment feedback useful for their learning. Many students spend a large quantity of time constructing a relatively small number of responses for those assignments. They are then unprepared for the time management required of them in the final test.

Recommendation

Review the assessment strategy with the teaching team to replace one or more of the written assignments with an online test that includes long answer responses.

Feedback from Teaching team observations

Feedback

A critical part of the learning strategy for this unit is the weekly tutorial where students are able to share their prepared responses to posted questions and learn how to improve responses relative to assessment criteria. Even with these weekly sessions included in the timetable to ensure students plan their availability for the class, relatively few students attend. Many students do not recognise how the tutorials help them build skills for assessment as well as supporting theory knowledge. Many students also do not understand how the assessment criterial are applied to the marking or how to use the feedback provided. If students see a more explicit connection between tutorials and assessment success, participation may increase.

Recommendation

Modify the weekly tutorial plan to include discussion of one sample test question to analyse and include sample responses that are critiqued relative to assessment criteria.

Unit Learning Outcomes

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

1. Discuss fundamental concepts, theories and principles of classical mechanics, matter, heat, sound, electromagnetism, electromagnetic energy and the atom
2. Apply fundamental physics concepts, theories and principles to explain physical phenomena of everyday life and clinical situations and to predict outcomes under changing conditions
3. Use problem-solving and numeracy skills, knowledge of fundamental physics concepts, theories and principles, and standard conventions of science communication to present reasonable solutions to problems.

Alignment of Learning Outcomes, Assessment and Graduate Attributes

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes		
	1	2	3
1 - Written Assessment - 15%	•	•	•
2 - Written Assessment - 25%	•	•	•
3 - Online Test - 60%	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes		
	1	2	3
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 - Written Assessment - 15%	•	•		•						
2 - Written Assessment - 25%	•	•		•						
3 - Online Test - 60%	•	•		•						

Textbooks and Resources

Textbooks

MEDI11002

Prescribed

Conceptual Physics
Edition: 12th global (2015)
Authors: Paul G. Hewitt
Pearson Education Limited
Harlow , Essex , England
ISBN: 9781292057538
Binding: eBook

Additional Textbook Information
You may use either the e-book or hard copy version of the textbook. Both can be purchased through the University's Bookshop. If you choose to get your book from another source, ensure that you purchase the 12th GLOBAL edition, not the 12th edition as the content is not the same for the two.

View textbooks at the CQUniversity Bookshop

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

Referencing Style

All submissions for this unit must use the referencing styles below:

- Harvard (author-date)
- Vancouver

For further information, see the Assessment Tasks.

Teaching Contacts

Deepa Rijal Unit Coordinator
d.rijal@cqu.edu.au

Schedule

Week 1 - 08 Nov 2021

Module/Topic	Chapter	Events and Submissions/Topic
• Science Fundamentals • Deductive Logic and Problem-solving • Using learning goals in your study • Introduction to Kinematics • Newton's First Law of Motion • Newton's Second and Third Laws of Motion	Conceptual Physics - Excerpts from Chapters 2, 3, 4 & 5 'Chapter 1: Physics and the Life Sciences' from *Physics for the Life Sciences* 2nd ed. by Zinke-Allemang, Sills, Nejat, Galiano-Riveros.	Tutorial on core skills for this unit

Week 2 - 15 Nov 2021

Module/Topic	Chapter	Events and Submissions/Topic

• Momentum, Energy, Power, Centre of Mass • States of Matter	Conceptual Physics - Excerpts from Chapters 6 & 7, 11 - 14	Tutorial on Week 1 content

Week 3 - 22 Nov 2021

Module/Topic	Chapter	Events and Submissions/Topic
• Pressure • Static and Flowing Fluids • Pressure in Gases • Heat and Temperature	Conceptual Physics - Excerpts from Chapters 11 - 13 'Chapter 14: Fluid Dynamics of Non-Viscous Fluids' from *Introduction to Biological Physics for the Health and Life Sciences* by Franklin, Muir, Scott, Wilcocks & Yates	Tutorial on Week 2 content

Week 4 - 29 Nov 2021

Module/Topic	Chapter	Events and Submissions/Topic
• Fundamentals of Traveling Waves • Sound • Doppler Effect	Conceptual Physics - Excerpts from Chapters 14, 15, 16, 18 & 19	Tutorial on Week 3 content

Vacation Week - 06 Dec 2021

Module/Topic	Chapter	Events and Submissions/Topic
Break Week		

Week 5 - 13 Dec 2021

Module/Topic	Chapter	Events and Submissions/Topic
• Electrostatics • Introduction to Electrodynamics (moving charges) and electrical circuits	Conceptual Physics - Excerpts from Chapters 19, 20 & 21	Tutorial on Week 4 content **Written Assignment 1** Due: Week 5 Thursday (16 Dec 2021) 4:00 pm AEST

Week 6 - 20 Dec 2021

Module/Topic	Chapter	Events and Submissions/Topic
• Electrical supply and circuits	Conceptual Physics - Excerpts from Chapters 22 & 23	Tutorial on Week 5 content

Vacation Week - 27 Dec 2021

Module/Topic	Chapter	Events and Submissions/Topic
Break Week		

Week 7 - 03 Jan 2022

Module/Topic	Chapter	Events and Submissions/Topic
• Electric shock and safety practices	Conceptual Physics Chapter 23 (see also assigned reading from online resources)	Tutorial on Week 6 content

Week 8 - 10 Jan 2022

Module/Topic	Chapter	Events and Submissions/Topic
• Magnetism • Electromagnetism	Conceptual Physics - Excerpts from Chapters 24 & 25	Tutorial on Week 7 content

Week 9 - 17 Jan 2022

Module/Topic	Chapter	Events and Submissions/Topic
• Electromagnetic Energy • Quanta • Forms of Electromagnetic Energy	Conceptual Physics - Excerpts from Chapters 26, 30 & 31	Tutorial on Week 8 content

Week 10 - 24 Jan 2022

Module/Topic	Chapter	Events and Submissions/Topic

		Tutorial on Week 9 content
• Visible light • Introduction to optics	Conceptual Physics - Excerpts from Chapters 26 - 30	**Written Assignment 2** Due: Week 10 Tuesday (25 Jan 2022) 4:00 pm AEST

Week 11 - 31 Jan 2022

Module/Topic	Chapter	Events and Submissions/Topic
• Ionising Radiation • X-ray Production • Radioactive Emissions	Conceptual Physics - Excerpts from Chapters 32 - 33	Tutorial on Week 10 content

Week 12 - 07 Feb 2022

Module/Topic	Chapter	Events and Submissions/Topic
Revision and consolidation		Tutorial on Week 11 content Q&A revision tutorial

Exam Week - 14 Feb 2022

Module/Topic	Chapter	Events and Submissions/Topic
		Final online test will be scheduled in the University's Exam period - date and time to be advised.

Term Specific Information

You are expected to spend on average 10 - 12 hours of time each week in your study activities for this unit. A suggested time budget for weekly study is:

- 2 - 2½ hours for watching recorded lectures and taking notes
- 1 - 1½ hours for completing assigned reading
- ½ - 1 hour for completing other posted learning activities
- 2 - 2 ½ hours for creating study notes to meet weekly learning goals using the lectures and readings
- 1 - 1 ½ hours for applying weekly content using posted end-of-chapter questions
- ½ - 1 hour for working on posted tutorial questions in preparation for tutorial
- 1 hour for participation in tutorial
- 1 - 2 hours for assignment preparation and/or revision for final test

Tutorials are interactive sessions where your participation enables you to check your understanding of and your ability to apply the week's concepts and for you to build your skills in responding to test questions. From Week 2 onward, the scheduled tutorial covers concepts from the previous week. This enables you to use the tutorial to consolidate your knowledge from the week's study. Your regular participation in tutorials strongly supports your success in the unit. While recordings of online tutorials will be provided (if there is sufficient student attendance), these recordings are not intended to replace your active participation in live sessions.

Assessment Tasks

1 Written Assignment 1

Assessment Type
Written Assessment

Task Description
As a future healthcare professional, you need to be able to harness core physical concepts and terminology to predict and explain observations in your clinical environment. This assessment requires you to demonstrate knowledge and understanding of some core physics concepts and terminology that you will learn in the first three weeks of study in this unit.
The intent of this assessment is for you to demonstrate your ability to do three things:

- select principles, concepts and facts that are relevant to a situation,
- apply the concepts logically to solve a problem,
- communicate your reasoning using terminology and science conventions correctly.

This assignment consists of three parts:

- Section 1 will require you to differentiate the meanings of similar keywords
- Section 2 will require you to determine whether a given statement is true or false and provide your reasoning.
- Section 3 will be a numerical word problem.

Weekly tutorials will provide practice in analysing assessment questions, structuring logical and thorough responses and assessing your responses relative to the posted assessment criteria.

The posted weekly learning goals articulate the specific terminology (keywords), concepts and skills you are expected to learn in the unit and form the basis for the assessment questions. You should be able to answer these questions using your learning from watching the unit lecture videos, reading the assigned text and from other assigned learning activities from Weeks 1 - 3. There is no expectation that you will need to research any additional material in order to complete the assessment.

You should use the number of marks indicated for the question as a guide to the depth of response and number of main points expected. There is no target word count for the assignment or for any individual question. However, a guidance statement for each question will indicate a typical number of paragraphs that would be sufficient to address the question.
The completed assignment must be word-processed and in either Word or pdf file format.

Further details on the assignment, including the questions, marking rubric and formatting requirements will be provided on the unit Moodle site.

Assessment Due Date
Week 5 Thursday (16 Dec 2021) 4:00 pm AEST

Return Date to Students
Week 7 Friday (7 Jan 2022)

Weighting
15%

Assessment Criteria
Each question on the assignment instruction page will indicate the number of marks per segment. Responses are scored based on:

- correct use of terminology
- factual correctness of presented material
- correct use of science conventions
- relevance of stated content to the question asked
- application of foundation concepts to the question asked
- clarity, thoroughness and completeness of explanations
- logic of explanations and problem-solving
- application of an explicit step-by-step approach to solving numerical problems
- correct and complete citing of information sources

More details can be found in the Assessment Instruction page and the marking rubric/scoring guide posted on the unit Moodle site.

Referencing Style

- Harvard (author-date)
- Vancouver

Submission
Online

Learning Outcomes Assessed

- Discuss fundamental concepts, theories and principles of classical mechanics, matter, heat, sound, electromagnetism, electromagnetic energy and the atom
- Apply fundamental physics concepts, theories and principles to explain physical phenomena of everyday life and clinical situations and to predict outcomes under changing conditions
- Use problem-solving and numeracy skills, knowledge of fundamental physics concepts, theories and principles, and standard conventions of science communication to present reasonable solutions to problems.

Graduate Attributes

- Communication
- Problem Solving
- Information Literacy

2 Written Assignment 2

Assessment Type
Written Assessment

Task Description
As a future healthcare professional, you need to be able to harness core physical concepts and terminology to predict and explain observations in your clinical environment. This assessment requires you to demonstrate knowledge and understanding of core physics concepts and terminology that you will learn in the first eight weeks of study in this unit. The intent of this assessment is for you to demonstrate your ability to do three things:

- select principles, concepts and facts that are relevant to a situation,
- apply the concepts logically to solve a problem,
- communicate your reasoning using terminology and science conventions correctly.

This assignment consists of three parts:

- Section 1 will require you to determine whether a given statement is true or false and provide your reasoning
- Section 2 will be a numerical word problem
- Section 3 will require you to explain the underlying physics of a given situation and predict what would occur under specific changed circumstances.

The posted weekly learning goals articulate the specific terminology (keywords), concepts and skills you are expected to learn in the unit and form the basis for the assessment questions. You should be able to answer these questions using your learning from watching the unit lecture videos, reading the assigned text and from other assigned learning activities from Weeks 4 - 8. You will also be expected to integrate concepts and apply terminology from the first three weeks of study. There is no expectation that you will need to research any additional material in order to complete the assessment. Weekly tutorials will provide practice in analysing assessment questions, structuring logical and thorough responses and assessing your responses relative to the posted assessment criteria.

You should use the number of marks indicated for the question as a guide to the depth of response and number of main points expected. There is no target word count for the assignment or for any individual question. However, a guidance statement for each question will indicate a typical number of paragraphs that would be sufficient to address the question.

The completed assignment must be word-processed and in either Word or pdf file format.

Further details on the assignment, including the questions, marking rubric and formatting requirements will be provided on the unit Moodle site.

Assessment Due Date
Week 10 Tuesday (25 Jan 2022) 4:00 pm AEST

Return Date to Students
Week 12 Wednesday (9 Feb 2022)

Weighting
25%

Assessment Criteria
Each question on the assignment instruction page will indicate the number of marks per segment. Responses are scored based on:

- correct use of terminology
- factual correctness of presented material
- correct use of science conventions
- relevance of stated content to the question asked
- application of foundation concepts to the question asked
- clarity, thoroughness and completeness of explanations
- logic of explanations and problem-solving
- application of an explicit step-by-step approach to solving numerical problems
- correct and complete citing of information sources

More details can be found in the Assessment Instruction page and the marking rubric/scoring guide posted on the unit

Moodle site.

Referencing Style

- Harvard (author-date)
- Vancouver

Submission
Online

Learning Outcomes Assessed

- Discuss fundamental concepts, theories and principles of classical mechanics, matter, heat, sound, electromagnetism, electromagnetic energy and the atom
- Apply fundamental physics concepts, theories and principles to explain physical phenomena of everyday life and clinical situations and to predict outcomes under changing conditions
- Use problem-solving and numeracy skills, knowledge of fundamental physics concepts, theories and principles, and standard conventions of science communication to present reasonable solutions to problems.

Graduate Attributes

- Communication
- Problem Solving
- Information Literacy

3 Final Online Test

Assessment Type
Online Test

Task Description
You will complete a 150 minute time-limited online test during the university examination period, at a time scheduled by the School of Health, Medical and Applied Science. The purpose of this test is for you to demonstrate your understanding and ability to apply the concepts and correct use of the terminology from all weeks of the unit content.

When completing the test, you will be required to:

- demonstrate logical application of concepts and ability to articulate them
- discuss the physics related to a given situation in terms of explaining why the situation has occurred, what would happen if the situation was altered in a specific way, how to achieve a specific outcome in altering the situation and/or what outcome would logically follow the occurrence of the situation
- solve numerical problem
- use terminology correctly

The number of marks for each question are allocated based on the depth and breadth of the required response and will be indicated on the test. There will be some terminology matching questions but the majority of the test involves written responses. The types of written response questions will be similar in nature to those discussed in weekly tutorials.

All test questions are based directly on the published weekly learning goals. There will be a representative sampling from each week's content from Weeks 1 - 11, with heavier weighting for Weeks 9 - 11 because content from Weeks 1 - 8 has already been assessed to some extent in the two written assignments. You are encouraged to use the learning goals to guide your weekly learning as well as your revision for the final test. The verbs of the learning goals indicate the depth and scope of expected performance relative to each week's theory content.

This is an open book test. It means that during the test you may access your study notes, textbook, the unit Moodle site and/or any website.

The standards of academic integrity still apply. Just as for the written assignments, you must acknowledge content that is not your own - if you paraphrase from external sources other than the textbook or lectures, you must formally cite your source. *If you copy any content word-for-word from ANY source, you must put that content in quotation marks and formally cite your source.*

Your test responses must be your own work. You cannot seek assistance or make use of assistance from another person during this test. You may not communicate with any other person during the test (whether verbally, electronically or in writing) for any purpose relating to the test questions or your responses. You may not share the test content with any other person for any reason. At the start of the test you will need to make a declaration that you understand these rules of academic integrity and that you agree to abide by them. Any identified cases of potential

collusion will result in a *breach of academic integrity* case being raised.

Although the test is an open book assessment, you must remain mindful of the time you are taking to answer each question and have an understanding of the content and also familiarity with your resources to use them effectively. You should not expect to have the time to consult your notes and/or other resources for every question.

You will need to ensure that you have reliable internet access and a computer for this test. It is highly recommended that you do not attempt the test using a tablet or smartphone due to the quantity of typing required.

It is your responsibility to log on to the unit Moodle site and complete the online test during the time the test is available. if you start the test with less than 150 minutes to the closing time, you will have less time to enter responses - your test will still close at the due date/time. In the absence of an approved extension, you cannot complete this assessment at a later time, and you will receive a mark of zero for the assessment if you have not submitted it by the scheduled date and time.

Assessment Due Date

To be scheduled during the University's Examination Period in Weeks 13/14.

Return Date to Students

Scores will be released two weeks after the test date.

Weighting
60%

Minimum mark or grade
50%

Assessment Criteria
Responses are scored on the basis of their correctness, completeness and relevance to the question that was asked. The expected depth of response to each question is indicated by the number of marks for the question. Unless otherwise specified, you are expected to provide one key factual or logic point (typically one to two sentences) for each mark. (For example, a question worth five marks should have five key points included in the response.)

Referencing Style

- Harvard (author-date)
- Vancouver

Submission
Online

Learning Outcomes Assessed

- Discuss fundamental concepts, theories and principles of classical mechanics, matter, heat, sound, electromagnetism, electromagnetic energy and the atom
- Apply fundamental physics concepts, theories and principles to explain physical phenomena of everyday life and clinical situations and to predict outcomes under changing conditions
- Use problem-solving and numeracy skills, knowledge of fundamental physics concepts, theories and principles, and standard conventions of science communication to present reasonable solutions to problems.

Graduate Attributes

- Communication
- Problem Solving
- Information Literacy

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