



MEDI11002 *Physics for Health Sciences*

Term 1 - 2024

Profile information current as at 15/05/2024 07:21 am

All details in this unit profile for MEDI11002 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

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 1 - 2024

- Mackay
- 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. **Online Quiz(zes)**

Weighting: 40%

2. **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 Unit coordinator reflection Informal student feedback

Feedback

Provision of breakdown of question types, marks and time budget in preparation for the tests were well received by students.

Recommendation

Continue with the provision of breakdown of question types, marks and time budget in preparation for the tests.

Feedback from Unit coordinator reflection Moodle data

Feedback

Student completion rate for practice tests was noted to be quite high.

Recommendation

Maintain the provision of a practice tests to support students in preparing for their assessments.

Feedback from Unit coordinator reflection SUTE

Feedback

Updating existing lecture video resources and incorporating visuals and/or examples of real world applications of physics concepts will be beneficial to students.

Recommendation

Determine which lecture videos have poor quality and prioritise them for renewal with inclusion of more visuals and/or examples of real world applications where possible for future iterations.

Feedback from Unit coordinator reflection

Feedback

Complementing the weekly end of chapter questions and answers with weekly formative quizzes will further support students in their progress check and consolidation of weekly content.

Recommendation

Investigate the option of incorporating weekly formative quizzes as part of the progress check activity to support student learning of content.

Feedback from SUTE Informal student feedback

Feedback

Some students found the peer assisted study sessions (PASS) valuable in their learning of unit content.

Recommendation

Investigate the possibility of continuing PASS support in future iterations of the unit to support students in their learning of the unit content.

Feedback from MI teaching team Unit coordinator reflection

Feedback

The three weekly online tutorial sessions are experiencing low turnout of students.

Recommendation

Consider scaling back on the number of tutorials to encourage higher student attendance in each weekly tutorial session.

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 - Online Quiz(zes) - 40%	•	•	•
2 - 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			

Textbooks and Resources

Textbooks

MEDI11002

Prescribed

Conceptual Physics

Edition: 13th global (2022)

Authors: Paul G. Hewitt

Pearson Education Limited

Harlow , Essex , England

ISBN: 9781292437415

Binding: eBook

[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

Reshmi Kumar Unit Coordinator

r.d.kumar@cqu.edu.au

Schedule

Week 1 - 04 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Science fundamentals, Kinematics and Newton's Laws <ul style="list-style-type: none">• Science Basics• Introduction to Kinematics• Newton's First, Second and Third Laws of Motion	Conceptual Physics - Excerpts from Chapters 2, 3, 4 & 5 'Chapter 1: Physics and the Life Sciences' from <i>Physics for the Life Sciences</i> 2nd ed. by Zinke-Allemang, Sills, Nejat, Galiano-Riveros.	Tutorial on Week 1 content

Week 2 - 11 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Change in object's state of motion, Structure and States of matter <ul style="list-style-type: none">• Momentum, Inertia, Impulse• Energy, Power, Centre of Mass• Structure of Matter• States of Matter	Conceptual Physics - Excerpts from Chapters 6 & 7, 8, 11 & 12	Tutorial on Week 2 content

Week 3 - 18 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Pressure in liquids & gases, Heat and Temperature <ul style="list-style-type: none"> • Pressure • Static and Flowing Fluids • Pressure in Gases • Internal energy, Heat and Temperature • Heat transfer 	Conceptual Physics - Excerpts from Chapters 13 - 16 & 18 'Chapter 14: Fluid Dynamics of Non-Viscous Fluids' from <i>Introduction to Biological Physics for the Health and Life Sciences</i> by Franklin, Muir, Scott, Wilcocks & Yates	Tutorial on Week 3 content

Week 4 - 25 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Waves and Sound <ul style="list-style-type: none"> • Fundamentals of Traveling Waves • Transverse and Longitudinal waves • Wave interference • Sound • The Doppler Effect 	Conceptual Physics - Excerpts from Chapters 19, 20 & 21	Tutorial on Week 4 content Online test 1. Available from 8:00am - 8:00pm AEST on Thursday 28th March 2024.

Week 5 - 01 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Electrostatics, Electrical circuits and Laws governing them <ul style="list-style-type: none"> • Charges and Electrostatic Force • Movement of charges • Electric fields and potentials • Moving charges using electrical potentials • Circuit basics • Ohm's Law • Kirchoff's Laws 	Conceptual Physics - Excerpts from Chapters 22 & 23	Tutorial on Week 5 content

Vacation Week - 08 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Break Week		

Week 6 - 15 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Electrical supply and circuits <ul style="list-style-type: none"> • Energy and Power in circuits • Series circuit • Parallel circuits • Switches in circuits • AC supply and Ground • Current to and through a device • Circuit heating and CLDs 	Conceptual Physics - Excerpts from Chapter 23	Tutorial on Week 6 content

Week 7 - 22 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Electric shock and safety practices <ul style="list-style-type: none"> • Basics of electric shock • Effects of electric shock • Macroshock versus Microshock • Circuit faults and detection devices • Reducing shock risk • Safe practices in using electrical devices 	Conceptual Physics Chapter 23 (see also assigned reading from online resources)	Tutorial on Week 7 content

Week 8 - 29 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Magnetism, electromagnetism and real-world applications

- Foundations of Magnetism
- Magnetic properties of charges and materials
- Introduction to Electromagnetism
- The Motor Effect
- Electromagnetic Induction
- Applications of Electromagnetism

Conceptual Physics - Excerpts from Chapters 24 & 25

Tutorial on Week 8 content
Online test 2. Available from 8:00am - 8:00pm AEST on Friday 3rd May 2024.

Week 9 - 06 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Electromagnetic Energy (EM) <ul style="list-style-type: none">• Production and propagation of electromagnetic energy• The Wave particle duality of EM• Quantum nature of orbital electrons• EM's travel through matter and interactions• Penetrability of EM beams• The EM spectrum	Conceptual Physics - Excerpts from Chapters 26, 30, 31 & 32	Tutorial on Week 9 content

Week 10 - 13 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Physics of vision and seeing with light <ul style="list-style-type: none">• Selective behaviours of light• Reflection of light• Refraction, lenses and light images• The physics of vision• Application of light properties	Conceptual Physics - Excerpts from Chapters 26 - 28 & 30	Tutorial on Week 10 content

Week 11 - 20 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
X-rays and radioactivity <ul style="list-style-type: none">• Quanta and orbital electrons• X-ray production by decelerating electrons• X-ray production by electron de-excitation• The radioactive nucleus• Radioactive emissions• Radioactive decay, Half-life, Activity and Risk of detriment• Common sources of environmental radiation• Clinical applications of x-rays and radioactive materials	Conceptual Physics - Excerpts from Chapters 32 - 34	Tutorial on Week 11 content

Week 12 - 27 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Revision and consolidation		Q&A revision tutorial

Review/Exam Week - 03 Jun 2024

Module/Topic	Chapter	Events and Submissions/Topic
		Final Online Test Due: Review/Exam Week Monday (3 June 2024) 11:00 am AEST

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 - 2½ hours for creating study notes to meet weekly learning goals using the lectures and readings

1 - 1½ 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 preparation and/or revision for assessments

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. 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 Online tests

Assessment Type

Online Quiz(zes)

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. You will be required to complete two online tests during the term. The aim of these In-term online tests is for you to demonstrate your knowledge, understanding and ability to apply core physics concepts and correct use of terminology that you will be learning in this unit.

Both the tests will be made available via the unit Moodle site. Each online test will be time-limited and once you open the test, you will not be able to pause or restart it. Once opened, the online tests will remain open for a specified duration and will automatically close once the specified time is reached. Any unanswered questions or unsaved responses will receive a mark of zero.

Online test 1

- The test contributes 15% towards the final unit grade.
- *This test will be held on **Thursday 28th March 2024 in Week 4** and it will be assessing the first three weeks (i.e. Weeks 1-3) of content covered in this unit.*
- The test will be **available from 8:00am - 8:00pm AEST**.
- *This test is **time-limited to 45 minutes**. Please note, if you begin the test less than 45 minutes before the stated closing time, the test will close at that time and you will have less than 45 minutes to complete the test.*

Online test 2

- The test contributes 25% towards the final unit grade.
- *This test will be held on **Friday 3rd May 2024 in Week 8** and it will be focusing on content covered from Weeks 4-7 in the unit. You will also be expected to integrate concepts and apply terminology from the first three weeks of study when completing this test.*
- The test will be **available from 8:00am - 8:00pm AEST**.
- *This test is **time-limited to 60 minutes**. Please note, if you begin the test less than 60 minutes before the stated closing time, the test will close at that time and you will have less than 60 minutes to complete the test.*

All questions will be based on the posted weekly learning goals. Question tasks will be a similar type to those discussed in weekly tutorials. The tasks may include analysis of diagrams, photographs and/or images. Questions may include quiz-style questions (for example multiple choice, fill-in-the blank, matching), true/false with explanation and written response. 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 problems
- 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.

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. 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.

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 response must be your own work. You cannot seek assistance or make use of assistance from another person during the 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.

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 late, you will still be required to submit at the stated closing 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.

Number of Quizzes

2

Frequency of Quizzes

Other

Assessment Due Date

Online test 1 will be available from 8:00am - 8:00pm AEST on Thursday 28th March 2024. Online test 2 will be available from 8:00am - 8:00pm AEST on Friday 3rd May 2024.

Return Date to Students

Feedback for each online test will be provided within two weeks of the due date for the test.

Weighting

40%

Assessment Criteria

Question responses will be scored on the following criteria:

- correct use of terminology
- correct selection and application of core concepts to the specific content of the question
- clarity, correctness, relevance and completeness of the response in addressing the question that was asked
- critical thinking

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 logical 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.

2 Final Online Test

Assessment Type

Online Test

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. You will complete a 90 minute time-limited final online test. The purpose of this test is for you to demonstrate your knowledge, understanding and ability to apply core physics concepts and correct use of terminology that you will be learning in this unit.

This test will be made available via the unit Moodle site on from 9:00am to 11:00am AEST on Monday 3rd June 2024 in Review/Exam Week. Note that the posted due date/time is the latest submission time, not the test start time. The test will be **time-limited to 90 minutes** and once you open the test, you will not be able to pause or restart it. Once opened, the test will remain open for 90 minutes and will automatically close once 90 minutes is up (or at the submission time if you have started the test with less than 90 minutes to the submission time) . Any unanswered questions or unsaved responses will receive a mark of zero.

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 late, you will still be required to submit at the stated closing time.

All questions will be based on the posted weekly learning goals. Question tasks will be a similar type to those discussed in weekly tutorials. The tasks may include analysis of diagrams, photographs and/or images. Questions may include quiz-style questions (for example multiple choice, fill-in -the blank, matching), true/false with explanation and written response. 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 were 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 problems
- 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.

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. 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.

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 response must be your own work. You cannot seek assistance or make use of assistance from another person during the 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.

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.

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

Review/Exam Week Monday (3 June 2024) 11:00 am AEST

Return Date to Students

Two weeks after the final test date.

Weighting

60%

Minimum mark or grade

50%

Assessment Criteria

Question responses will be scored on the following criteria:

- correct use of terminology
- correct selection and application of core concepts to the specific content of the question
- clarity, correctness, relevance and completeness of the response in addressing the question that was asked
- critical thinking

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.

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