



# PHYS1510

## Engineering Physics

Session 1, Weekday attendance, North Ryde 2020

*Department of Physics and Astronomy*

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# General Information

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Credit points

10

Prerequisites

(HSC Mathematics Band 4 and above or Extension 1 Band E2 and above or Extension 2) or MATH1000 or MATH130 or WFMA003 or WFMA003

Corequisites

Co-badged status

Unit description

The design and development of new technologies is governed and constrained by the fundamental laws of nature, as described by the principles and practice of physics. The topics studied in this unit are illustrated with everyday examples to provide an overview of physics for students studying engineering disciplines. Laboratory sessions enable physics concepts to be explored in a practical way, and build skills in experimentation, measurement, data collection and analysis.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

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

**ULO1:** explain foundational physics concepts in terms of their underlying physical principles and describe them in terms of concise mathematical models.

**ULO2:** analyse a real-world problem, break the problem into component parts relating to different areas of physics, identify known quantities and apply mathematical models to arrive at a numerical value for an unknown quantity, and interpret how the numerical results relate to the physical world.

**ULO3:** perform physical measurements, record experimental data, display data graphically, analyse data, and draw written conclusions in a clear, concise, and systematic manner.

**ULO4:** identify, record and explain sources of uncertainty in physical measurements; and

undertake appropriate uncertainty analysis of results, including statistical analysis.

**ULO5:** demonstrate foundational learning skills including active engagement in your learning process.

**ULO6:** work collaboratively with peers.

## Assessment Tasks

### Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult [iLearn](#) for revised unit information.

[Find out more about the Coronavirus \(COVID-19\) and potential impacts on staff and students](#)

## General Assessment Information

Overall you are expected to spend 150 hours studying and attending classes and assessments for this subject throughout the whole semester. Please ensure that you commit time each week to build your skills and understanding of Physics, laying the groundwork for success in this subject.

### Laboratory work

**Due: During class. See the lab schedule on iLearn for dates Weighting: 20%**

**Satisfactory completion of laboratories is a hurdle requirement.** You must attend **all ten** laboratory sessions. The **first lab session is in week 1** and includes work health and safety information. Students may also be assigned to lab groups, lab books will be handed out, and computer access will be checked. It needs to be attended by all students regardless of whether this is their first Physics unit or not. It will be a little bit shorter than the other sessions, but attendance is absolutely mandatory – you can't do subsequent lab sessions if you don't attend the introductory one. The **next 9 lab sessions** involve experimental work and will be assessed. **You must obtain a mark of at least 40% for each of the laboratory sessions in order to pass the unit.**

**Preparation is required** for each of the lab sessions 2-10. You will find the **Prelab activities** in the Laboratory Resources section of iLearn. Your prelab work will account for some of the marks for each laboratory session.

**If you miss a session or fail to achieve at least 40% for any lab session**, you must complete a **“Request to schedule a Catch-up laboratory session”** form, which can be found on iLearn. Read the sections below for full details about catch up classes and when they are scheduled. **No more than 3 catch-ups are allowed for missed labs/lab hurdles**, except where Special Consideration has been approved. If you fail to attend a catch-up class, then that will count as another missed lab.

Laboratory catch-up classes will be held during the mid-semester break and at the end of semester. The dates and times of the catch-up classes will be available on the "Request a catch-up lab" form.

**The Quizzes are a hurdle requirement. Weighting 25%. Students must participate meaningfully and actively for the full class duration in at least 9 of the problem-solving classes (SGTAs), including submitting the quiz for that class.**

**The Mid-semester Examination is not a hurdle requirement. Weighting 10%. This examination is expected to be held during the SGTA times in week 6.**

**The Final Examination is a hurdle requirement. Weighting 45%. You must obtain a mark of at least 40% in the final exam to be eligible to pass the unit.** If your mark in the final examination is between 30% and 39% inclusive, you may be given a second and final chance to attain the required level of performance; the mark awarded for the second exam towards your final unit mark will be capped at 40%, and you will be allowed to sit the second exam only if this mark would be sufficient to pass the unit overall.

**If you receive special consideration for the final exam, a supplementary exam will be scheduled after the end of the normal exam period. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.**

If you are given a second opportunity to sit the final examination as a result of failing to meet the minimum mark required, you will be offered that chance during the same supplementary examination period and will be notified of the exact day and time after the publication of final results for the unit

## Delivery and Resources

### Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: [https://ask.mq.edu.au/account/pub/display/unit\\_status](https://ask.mq.edu.au/account/pub/display/unit_status)

**General Information** Study material is hosted on the iLearn webpage for the unit as are all announcements <http://ilearn.mq.edu.au>

**Asking for help** A number of people can assist students while they undertake PHYS1510. For any inquiry please use this e-mail address: [phys1510@mq.edu.au](mailto:phys1510@mq.edu.au) instead of using people's personal e-mails. This will ensure that the best answer to your question is obtained.

**Unit textbook and textbook resources** The textbook for this unit is "Fundamentals of Physics"

by Halliday, Resnick, & Walker, 11th edition. It is essential that you obtain a copy (digital or physical) of this textbook (10th edition is sufficient) as we will be following it closely and you will find it an invaluable resource while working on 'assigned problems' in PHYS1510. Print versions or digital options are available through <https://www.wileydirect.com.au/buy/fundamentals-of-physics-11th-australia-new-zealand-edition/>. Students are also encouraged to sign up to the Wiley Plus website to make use of the extended learning resources available there - including interactive problem-solving resources. Instructions will be provided in lectures.

**Technology** Audio recordings and copies of slides from lectures will be available in iLearn through the Echo360 system. By virtue of the activities that occur in a physics lecture (demonstrations, problem-solving) making use of these resources is not equivalent to attending. These resources are good for review and revision. The use of **calculators** in the laboratory classes, when completing quizzes, in the in-session exam and in the final examination for this unit is usually necessary. In accordance with the Science & Engineering Faculty's policy, calculators with a full alphabet on the keyboard are not allowed in the quizzes, in-session exam or the final examination. Personal electronic devices such as smartphones, tablets, or laptops will be used for self-assessment quizzes and other learning enhancement classroom activities.

**Lectures, tutorials and laboratory sessions** This unit consists of three different formal types of activity:

**1. Lectures**, in which new material is presented, discussed and illustrated by examples and demonstrations. Attending lectures is an important part of studying physics since it allows you to gain an insight into the subject matter that reading the textbook alone cannot provide, and lecture attendance is compulsory. The lecturers can explain the concepts from several points of view, can point out and explain the most important aspects of the material and, very importantly, can illustrate the relationships and connections between the different concepts that are studied in PHYS1510 – no subject in physics stands on its own.

**2. Weekly problem-solving classes** In problem-solving classes, examples illustrating the material are presented for discussion (with fellow classmates and teachers) and problem-solving methods are practised. Classes in weeks 1-5 and 7-13 will include a 15 minute quiz, based on the earlier questions in that class and the lecture material from that week. Problem-solving classes form an important learning component of PHYS1510 and are therefore compulsory. We require effective participation in problem-solving classes entailing a focused work effort and attendance for the full session. If you do not participate effectively in a given week, for example arriving late or leaving the class early without extenuating circumstances, it will be grounds for receiving a score of zero for that week's quiz.

### **3. Laboratory sessions**

You will complete 10 lab sessions. The laboratory component is an essential component of your studies and so counts for an appreciable fraction of your final assessment. You will be introduced to some of the basic skills and techniques required of practicing physicists, scientists and engineers. **You will be issued with a Laboratory Notebook**, provided with instructional material in the form of **Laboratory Notes** which can be found in the Laboratory Resources section of iLearn, and assisted in the laboratory by a team of demonstrators. For each laboratory session, except in week 1, you are required to complete some preparatory work (**Pre-Lab**)

before attending your nominated Lab session. To figure out which Prelab to do, please consult the **Laboratory Schedule** on iLearn.

**Location:** There are two laboratories used for 1<sup>st</sup> year physics they are both in **14 SCO (formerly E7B)**:

**Room 114** (Ground floor at the North-East corner of building)

**Room 254** (First floor, north-facing side of the atrium)

Please check iLearn to see where your lab class will take place.

**Laboratory Safety:** You are required to follow all safety guidelines given in the first Lab session, your lab notes, and the lab staff. Food and drink cannot be consumed in the lab, and students without suitable covered footwear will be refused admission.

Lecture, laboratory and class times - See more detailed information in your timetable.

## Unit Schedule

### Coronavirus (COVID-19) Update

The unit schedule/topics and any references to on-campus delivery below may no longer be relevant due to COVID-19. Please consult [iLearn](#) for latest details, and check here for updated delivery information: [https://ask.mq.edu.au/account/pub/display/unit\\_status](https://ask.mq.edu.au/account/pub/display/unit_status)

**Lectures:** A more detailed week-by-week schedule is listed on iLearn.

The unit is taught in two halves: • *Mechanics*, A/Prof Alex Fuerbach, Weeks 1-7: Chapters 1-12, 15 (Australia & New Zealand 11th edition)

• *Thermal Physics and Electromagnetism*, Prof Judith Dawes, Weeks 8-13: Chapters 18-20, 21, 22, 24 and 28 (11th edition)

Lecture times are on Tuesday at 1-2 pm and Wednesday at 1-2 pm in 23 Wallys Walk, Theatre 2,

**Laboratory sessions:** Each student will attend 10, 3-hour long laboratory sessions, starting in week 1.

**Problem-solving classes:** Each student will attend 13, 2-hour long classes, starting in week 1. Note that there is a mid-semester exam held during the classes in week 7.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)



- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Changes from Previous Offering

The subject content was substantially changed in semester 2 2019, and for this offering, we made small adjustments to the weekly quizzes and tutorial questions

## Changes since First Published

Date	Description
19/02/2020	change to the unit learning outcomes mapping