WPHY143

Physics 1B

MUIC Jan 2018

Macquarie University International College

Contents

General Information

Unit convenor and teaching staff
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Credit points
3

Prerequisites

Corequisites

Co-badged status

Unit description
This unit, together with WPHY140, provides an overview of physics. This unit includes a broad range of topics suitable for engineering students or those majoring in any of the sciences. This unit begins with topics in classical physics: the physics of oscillations and wave motion, including sound waves, diffraction and the wave behaviour of light, leading to an introduction to geometrical and physical optics and the operation of some optical instruments. The unit then moves on to look at some of the theories of modern physics that influence the way that we view the natural world, and the fundamental laws that govern it. An introduction is given to molecular kinetic theory and the important universal laws of thermodynamics, the latter valid for everything from the boiling of a kettle to exploding black holes. Einstein's theory of special relativity and its counter-intuitive views on space and time, the uncertain world of quantum physics, and what the latter tells us about the structure of atoms and nuclei, conclude the unit. Regular guided laboratory work enables students to investigate the phenomena discussed in the lectures, using modern techniques in a well-equipped laboratory.

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:

Explain Physics concepts, within the topics listed in the unit guide, in terms of their

underlying physical principles, and describe them in terms of concise mathematical models.

Analyse the description of a physical problem, be able to 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.

Analyse real-world problems, be able to develop physical problems based on this analysis, and interpret how numerical results relate to the physical world.

Record experimental data, display data graphically, analyse data, and present conclusions in a clear, concise, and systematic manner.

Identify sources of uncertainty in physical measurements, be able to propagate these uncertainties through calculations, and express results in a meaningful way.

Use discipline-specific terminology to communicate concepts and ideas relevant to this unit.

General Assessment Information

Requirements to Pass

In order to pass this unit a student must obtain a mark of 50 or more for the unit (i.e. obtain a passing grade P/ CR/ D/ HD).

For further details about grading, please refer to Schedule 1 of the Assessment Policy.

Students must also pass any hurdle assessments as stipulated in the Assessment Section of this Unit Guide.

Grading

The College will award common result grades as specified in Schedule 1 of the Assessment Policy.

Students will receive criteria and standards for specific assessment tasks, which will be aligned with the grading descriptors given in Schedule 1.

The attainment (or otherwise) of learning outcomes for a unit of study will be reported by grade and mark which will correspond to the Schedule 1 and be as outlined below.

Grade		Mark Range	Outcome	Description
HD	High Distinction	85-100	Pass	Provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality, insight or creativity in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application as appropriate to the program.

D	Distinction	75-84	Pass	Provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality or creativity in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the program and the audience.
CR	Credit	65-74	Pass	Provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; convincing argumentation with appropriate coherent justification; communication of ideas fluently and clearly in terms of the conventions of the program.
P	Pass	50-64	Pass	Provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the program; routine argumentation with acceptable justification; communication of information and ideas adequately in terms of the conventions of the program. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes.
F	Fail	0-49	Fail	Does not provide evidence of attainment of learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; missing, undeveloped, inappropriate or confusing argumentation; incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the program.
FA	Fail		Did Not Attend	Student has failed the compulsory attendance component of assessment
FH	Fail	49	Failed Hurdle	Student has obtained a raw mark over 50, yet failed all available attempts of at least one hurdle assessment (as described within Schedule 2 of the Assessment Policy).

Final Grades not receiving a mark because the student has withdrawn after the Census Date, not submitted or completed one or more components of the assessment, has been awarded a supplementary assessment or because of an unresolved matter such as allegations of academic misconduct are outlined in Schedule 1.

Where to find information about assessment

General assessment information including the number and nature of assessments, due dates and weightings has been provided in this unit guide.

Specific assessment information including assignment instructions, questions, marking criteria and rubrics as well as examples of relevant and related assessment tasks and responses will be available in the Assessment section on iLearn. For units that have final examinations, students may access past final exam papers using MultiSearch.

Student Responsibilities

As per the Assessment Policy, students are responsible for their learning and are expected to:

- actively engage with assessment tasks, including carefully reading the guidance

provided, understanding criteria, spending sufficient time on the task and submitting work on time;
- read, reflect and act on feedback provided;
- actively engage in activities designed to develop assessment literacy, including taking the initiative where appropriate (e.g. seeking clarification or advice, negotiating learning contracts, developing grading criteria and rubrics);
- provide constructive feedback on assessment processes and tasks through student feedback mechanisms (e.g. student surveys, suggestions for future offerings, student representation on committees);
- ensure that their work is their own; and
- be familiar with University policy and College procedures and act in accordance with those policy and procedures.

Submission of Assessment Tasks

Assessments must be submitted in accordance with instructions provided in this unit guide. Assessment tasks which have not been submitted as required will not be marked; they will be considered a non-submission and zero marks will be awarded for the task.

Extensions & Late Submissions

Extensions will only be granted as a result of a successful application for Special Consideration. To apply for an extension of time for submission of an assessment item, students must submit their application for Special Consideration via ask.mq.edu.au.

Late submissions without an approved extension are possible but will be penalised at 20% per 24 hour period or thereof up to 4 days (weekend inclusive).

Example: An assignment is due at 5:00 pm on a Friday and is marked out of 100 marks.

- If a student submits at 5:02 pm on the Friday and no special consideration has been granted, a penalty of 20% of the total marks possible (20 marks) will be deducted from their result.
- If the student submits the assignment on Sunday and no special consideration has been granted, then a penalty of 40% (40 marks) will be deducted and so on.
- If a student submits an assessment task 5 or more days after the due date and no special consideration has been granted, a record of submission will be made and student will be provided with feedback, but they will receive zero marks for the assessment task as a full (100%) penalty will be applied.

Where a student has been granted an extension and submits late, late penalties will be applied following the due date.

Please see “In class assessment” section for further information on in class assessments.

Resubmissions after the Due Date / Time

Students may resubmit their work up to four days after the due date if for example, they have submitted the incorrect document, or forgotten to include information. These resubmissions will be treated as late submissions and will be penalised at 20% per 24 hour period or thereof up to 4 days (weekend inclusive). After the 5th day record of submission will be made and feedback provided on the new content submitted but the student will receive zero marks for the assessment task.

In order to resubmit your work you will need to contact your teacher, and ask them to delete your original submission so that you can upload a new one. Teaching staff contact details have been provided in this unit guide.

Retention of Originals

It is the responsibility of the student to retain a copy of any work submitted. Students must produce these documents upon request. Copies should be retained until the end of the grade appeal period each term.

In the event that a student is asked to produce another copy of work submitted and is unable to do so, they may be awarded zero (0) for that particular assessment task.

Requests for original documentation will be sent to the applicant's student email address within six (6) months of notification by the student. Students must retain all original documentation for the duration of this six (6) month period and must supply original documents to the University within ten (10) working days of such a request being made.

In Class Assessment

Students must bring their Student ID Card to all assessment tasks, including in class assessments and produce this if requested. Students may be refused the opportunity to take an in class assessment task where unable to show their student ID card.

Where an assessment is to be held or submitted a scheduled lesson, students must be ready to submit, present or sit the assessment task at the start of the lesson, however not all assessments may commence at the beginning of the lesson. No additional time or adjustment will be made for late arriving students or students not ready to submit an assessment at the start of the lesson and late penalties may apply.

For example, if a one hour test or quiz is due to take place in a three hour lesson, the test or quiz may start at any time in the first two hours, so students must be ready to take the test at the beginning of the lesson. No additional time will be given to or adjustment made for students who arrive late. While they may still be permitted to take the test, depending on the task, the student will have only the remaining time to complete the task. Similarly, where an assessment task is due in a given lesson, late penalties may apply to a student who submits the task at the end of the lesson, depending on submission instructions for the task.

Final Examinations

The final examination period is from Thursday Week 6 until Monday of Week 7, including the weekend. This means that examinations and assessments may be held/due on the Saturday

during the final examination period and students must be available to take exams and submit assessments on this day. For unit specific details please refer to the Assessment section of this unit guide.

The University will publish the College Final Examination Timetable at least 4 weeks before the commencement of the final examination period and students will be able to access their final examination schedule in Week 3 of the Term.

Final Examination Requirements

Schedule 4 of the Assessment Policy explains what students are responsible for:

- checking the final examination timetable
- knowing the examination location (including seat number allocation) and arriving at allocated examination venue on time.
- knowing the structure and format of the examination
- adhering to the final examination timetable
- ensuring they are available for the full duration of the final examination period and supplementary examination period.

Details of the structure and format of the final examination paper will be made available to students via iLearn prior to the start of the final examination period. This detail will include:

- a copy of the examination coversheet, giving the conditions under which the examination will be held
- information on the types of questions the examination will contain, and
- an indication of the unit content the paper may examine.

Students must follow directions given by the Final Examination Supervisor.

Students will be required to present their Macquarie University Campus Card as photographic proof of identity for the duration of the final examination and may be refused the opportunity to take a final examination where unable to show their student ID card.

Students are not permitted to:

- enter a final examination venue once one hour from the time of commencement (excluding any reading time) has elapsed
- leave a final examination venue before one hour from the time of commencement (excluding any reading time) has elapsed
- leave a final examination venue during the last 15 minutes of the examination
- be readmitted to a final examination venue unless they were under approved supervision during the full period of their absence
- obtain, or attempt to obtain, assistance in undertaking or completing the final examination script

- receive, or attempt to receive, assistance in undertaking or completing the final examination script (Unless an application for reasonable adjustment has been approved)
- communicate in any way with another student once they have entered the final examination venue

Missed assessments and examinations

The Special Consideration Policy establishes the principles that support students seeking to notify the University when they experience short-term, unexpected, serious and unavoidable circumstances, which affect their performance in assessment. This Policy applies only to short-term, serious and unavoidable circumstances that arise after a study period has commenced, and where specific assessment task/s have been affected. Students with a pre-existing disability/ health condition or prolonged adverse circumstances are advised to seek support from Campus Wellbeing and should also refer to the Student Disability Support Policy.

In order to support students who have experienced serious and unavoidable circumstances, the University will attempt to provide affected students with one (1) additional opportunity to demonstrate that they have met the learning outcomes of a unit or units. An additional opportunity provided under such circumstances is referred to as Special Consideration, and may be granted after careful evaluation of the supporting evidence.

Students are expected to plan their work so that they can meet assessment deadlines at the same time as other obligations which they may have, both inside and outside the University. Special Consideration will not be granted when students are unable to complete an assessment task due to planned or foreseeable absence (e.g. holidays, recreational activities or normal work commitments or changes).

All applications for Special Consideration must be substantiated by original, independent documentary evidence in the format and by the deadline prescribed in the Procedure.

Please refer to the Special Consideration Policy section under Policies and Procedures below.

Supplementary Tests, Supplementary Examinations and Second Attempts at a Hurdle Assessments

Where a student has been granted a supplementary test or examination as a result of an application for special consideration, they will be advised of the time, date and location for the supplementary task.

Supplementary interim assessments (i.e. assessments held during the term) will be held throughout the term with sittings typically taking place on these days:

- Week 3: Wednesday AND/OR Friday
- Week 5: Wednesday AND/OR Friday
- Week 6: Thursday

The supplementary final examination period (i.e. for formal, end of term examinations) will span from Monday Week 7 until Friday Week 1 of the subsequent teaching term. Students who have lodged a special consideration application must be available to undertake examinations

during the supplementary examination period.

Where a student is eligible for **a second attempt at a hurdle assessment**, this will typically be organised during the supplementary interim/final examination periods unless stipulated otherwise in the assessment section of the unit guide. Students awarded second attempts at hurdles will be notified via email so please ensure you are checking your student email regularly.

No more than one (1) alternate assessment will be offered to a student in each affected unit, so it is essential that the student makes themselves available for the alternative assessment activity. Please refer to the Special Consideration Policy for further details.

Results for supplementary final examinations may not be available for up to two weeks following the supplementary examination. Students in their final term of study who undertake supplementary final exams and students who apply for special consideration for a unit which is a prerequisite to another unit in their program should note that formal completion of their Program will not be possible until supplementary results are released and this may impact on their ability to enrol in subsequent programs of study on time.

Accessing your Results

Students will be able to view their results for internal assessments via the Grades section in iLearn.

Grades (e.g. HD, D, CR, P, F) for all assessment tasks will be released to students once marking has concluded. Marks for individual assessments may be released as well.

Final results for the unit will be released at 00:01 on Friday of Week 7. Students will be able to view their final result for the unit via eStudent.

Calculating your GPA

A Grade Point Average (GPA) is a calculation that reflects the overall grades of a student in a coursework program. Please refer to the GPA Calculator.

Obtaining Feedback

Teaching staff will provide students with feedback about their academic progress and performance in assessment tasks or a unit of study. Where relevant, other staff such as Senior Teachers, Program Managers and members of the Student Administration and Services Team will provide feedback and advice to students about their performance in a program of study. Feedback may be provided to individual students, a group of students or a whole class and it may be written or verbal in nature.

Some examples of feedback include:

- Teaching staff member reviewing a draft submission and giving a student advice on how to improve their work before making a final submission
- Teaching staff member telling a class that they need to improve their editing of grammar in their recently submitted assignment.
- Teaching staff member discussing progress of an individual student before census date

to allow the student to decide whether they should remain enrolled in the unit.

- Online feedback via announcements or forums, an online marking rubric or various iLearn activities employed in a unit. Please note that feedback on written assessments is usually provided via Feedback Studio in iLearn.
- Written marks and comments on a marking sheet or essay.

Recorded voice comment provided in response to an essay submitted online.

- A student receiving advice that they should consider withdrawing from a unit because they have missed too many classes / too much work to be able to catch up or for other reasons.

It is a student's responsibility to:

- Attend sessions, be present and actively engaged during times when feedback is provided in scheduled class times.
- If absent from an in-class feedback session due to unavoidable circumstances, organise an alternative time with the teacher so that they can receive their feedback
- Ensure that they have received sufficient feedback prior to their next assessment task and/or final assessment in the unit
- Act promptly on feedback provided (e.g. incorporate advice provided into their work and study habits).

If you are unsure how or when feedback has been or will be provided, or you feel that feedback provided is not sufficient, you must approach relevant teaching or administrative staff and request additional feedback in a timely manner during the term and prior to any subsequent assessment task or the final assessment task for the unit. Claims that not enough feedback has been provided are not grounds for a grade appeal, especially where a student has not made any effort to approach staff about obtaining additional feedback in a timely manner. Students may seek general feedback about performance in a unit up to 6 months following results release.

If you have any problems contacting your teacher you must seek help from administrative staff at the E3A Level 2 Reception.

Contacting Teaching Staff Obtaining Help

Students may contact teaching staff at any time during the term by using the contact details provided in this guide. Students should expect a response within 1-2 business days. Teaching staff are unable to accept assessment submissions via email, all assessments must be submitted as outlined in the unit guide.

For all university related correspondence, students must use their official Macquarie University student email account which may be accessed via the Macquarie University Student Portal. Inquiries from personal email accounts will not be attended to.

Academic Honesty

Using the work or ideas of another person, whether intentionally or not, and presenting them as your own without clear acknowledgement of the source is called Plagiarism.

Macquarie University promotes awareness of information ethics through its Academic Honesty Policy. This means that:

- all academic work claimed as original must be the work of the person making the claim
- all academic collaborations of any kind must be acknowledged
- academic work must not be falsified in any way
- when the ideas of others are used, these ideas must be acknowledged appropriately.

All breaches of the Academic Honesty Policy are serious and penalties apply. Students should be aware that they may fail an assessment task, a unit or even be excluded from the University for breaching the Academic Honesty Policy.

Examples of Academic Dishonesty

Examples of some dishonest behaviours include deception, fabrication, obstruction, plagiarism and sabotage.

Deception includes:

- falsely claiming to have contributed to a group task or presenting collaborative work as one's own without acknowledging others' contributions
- falsely claiming to have submitted an assignment when this was not the case
- collusion (work together with someone else in a deceitful way to develop a submission for an assessment which has been restricted to individual effort)
- submission of a work previously submitted for another unit or another assessment, even if this is the student's own work
- creating a new article out of an existing article by rewriting/reusing it,
- cheating in an examination or asking someone else to complete an assessment or examination in one's place.

Plagiarism involves using the work or ideas of another person, whether intentionally or not, and presenting this as your own without clear acknowledgement of the source of the work or ideas. This includes, any of the following:

- copying part(s) of any document or audio-visual material or computer code or website content without indicating their origins
- using or extracting another person's concepts, experimental results, or conclusions
- summarising or paraphrasing another person's work
- submitting substantially the same final version of any material as another student in an assignment where there was collaborative preparatory work
- use of others (paid or otherwise) to conceive, research or write material submitted for

assessment (eg ghost writing)

- submitting the same or substantially the same piece of work for two different tasks or in different units (self-plagiarism).

Sabotage includes, but is not limited to, theft of work, destruction of library materials.

Fabrication involves creating false data, citation(s), or reports.

Obstruction involves intentionally impeding or interfering with another student's academic work

The University may commence applicable disciplinary procedures if a person who breaches the Academic Honesty Policy.

Turnitin

To uphold principles of Academic Honesty, Macquarie University employs online anti-plagiarism Software called Turnitin. Turnitin compares electronically submitted papers to a database of academic publications, internet sources and other student papers that have been submitted to the system to identify matching text. It then produces an Originality Report which identifies text taken from other sources, and generates a similarity percentage.

All text based assessments must be submitted through Turnitin as per instructions provided in the unit guide. It is the student's responsibility to ensure that work is submitted correctly prior to the due date. This includes verifying that correct files have been submitted as no special consideration will be given to students who have uploaded incorrect documents. No hard copies of assessments will be accepted and only Turnitin records will be taken as records of submission.

Multiple submissions may be possible via Turnitin prior to the final due date and time of an assessment task and originality reports may be made available to students to view and check their levels of similarity prior to making a final submission. Students are encouraged to use these reports to ensure that they do not breach they Academic Honesty Policy through high levels of similarity (plagiarism).

Students should note that the report on the initial submission will be immediate but on a second or subsequent submission it will take at least 24-36 hours for the similarity report to be generated. This may be after the due date so students should plan any resubmissions carefully. If you have not planned your submission time carefully and note high levels of similarity in your work after the due date, you can still resubmit your work, however a late penalty (20% per day) will apply. For instructions on how to resubmit your work please see "Resubmissions after the due date" section in this unit guide.

Teaching staff will use the report to judge whether plagiarism has occurred and whether penalties should apply for breaches of the Academic Honesty Policy. Any similar text identified by Turnitin will be considered carefully to see if it is indeed a breach of the Academic Honesty Policy.

There is no set percentage which indicates whether plagiarism has occurred; all identified matching text should be reconsidered carefully. If plagiarism has occurred or is suspected and resubmission is possible prior to the due date, students are advised to edit their work before

making a final submission. Help may be sought from teaching staff. Students may also access research resources provided by the library or Learning Skills.

Please refer to these instructions on how to submit your assignment through Turnitin and access similarity reports and feedback provided by teaching staff.

Should you have questions about Turnitin or experience issues submitting through the system, you must inform your teacher immediately. If the issue is technical in nature may also lodge a OneHelp Ticket, refer to the IT help page.

Submission of Drafts through Turnitin.

In some instances students may be required to submit drafts of written work via Turnitin **prior to the due date of the assessment** task so that they can receive feedback prior to making a final submission. If the student does not make a final submission prior to the due date, their draft will be counted as the final submission or late penalties applied.

Assessment Tasks

Name	Weighting	Hurdle	Due
Laboratory work	20%	Yes	Weekly
Assignments	10%	No	Wednesday of Weeks 4 and 6
Tests	15%	No	Lesson 5 of Week 2, 4 and 5
Final Examination	55%	Yes	MUIC Final Examination Period

Laboratory work

Due: **Weekly**
Weighting: **20%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

The first week of MUIC physics labs will consist of a an introduction to the labs and a work health and safety session. **Although some students will have already completed this type of session as part of their WPHY140 studies, they will still need to participate in this session as a refresher. Therefore, this is compulsory for all students. No student will be allowed to start lab work until they have completed an introduction and work heath and safety lab session.** Students also need to check computer access in the physics lab during this time. Students will be given in total 9 experiments to complete in the laboratory. **This assessment is a hurdle assessment task.** Students who do not meet this hurdle requirement will not pass the unit. In order to pass this unit, students **must** attend and successfully complete all 9 experiments. Students must attend 10 lab sessions in total, two sessions per week within the first 5 weeks of term. In week 6 students attend classes but no labs.

If students arrive late by more than 15 minutes, they will not be allowed to join into the lab

activities. They will need to submit an application for **Special Consideration** and **if successful, will need to attend the make up labs offered in week 6.** There will only be two make-up lab sessions.

To be deemed to have successfully completed an experiment, students **must** obtain a mark of **at least 40%** for each of the laboratory sessions. Students are responsible for ensuring that they complete experiments as required during the laboratory sessions in which they are enrolled.

All laboratory work must be recorded directly into a laboratory notebook. More detailed instructions and advice will be provided in iLearn and in the introductory laboratory session. The laboratory notebook will be assessed by the teaching staff at the end of each lab session. The laboratory notebook stays at the laboratory throughout the term.

Feedback will be provided in class.

On successful completion you will be able to:

- Explain Physics concepts, within the topics listed in the unit guide, in terms of their underlying physical principles, and describe them in terms of concise mathematical models.
- Analyse real-world problems, be able to develop physical problems based on this analysis, and interpret how numerical results relate to the physical world.
- Record experimental data, display data graphically, analyse data, and present conclusions in a clear, concise, and systematic manner.
- Identify sources of uncertainty in physical measurements, be able to propagate these uncertainties through calculations, and express results in a meaningful way.
- Use discipline-specific terminology to communicate concepts and ideas relevant to this unit.

Assignments

Due: **Wednesday of Weeks 4 and 6**
Weighting: **10%**

Problem solving is at the heart of physics and engineering. During the term students will be provided with a set of *assignment problems* based on the previous weeks' topics. Students will be required to complete two assignments. These two assignments are individual assessment tasks. More information about these assignments will be provided in iLearn prior to the submission date.

The assignments must be submitted in person in scheduled class time.

For late submissions, please refer to the late submission section included in this unit guide.

Feedback will be provided in class and marks in Gradebook.

On successful completion you will be able to:

- Explain Physics concepts, within the topics listed in the unit guide, in terms of their underlying physical principles, and describe them in terms of concise mathematical models.
- Analyse the description of a physical problem, be able to 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.
- Analyse real-world problems, be able to develop physical problems based on this analysis, and interpret how numerical results relate to the physical world.
- Identify sources of uncertainty in physical measurements, be able to propagate these uncertainties through calculations, and express results in a meaningful way.
- Use discipline-specific terminology to communicate concepts and ideas relevant to this unit.

Tests

Due: **Lesson 5 of Week 2, 4 and 5**
Weighting: **15%**

Three tests will be given to students in Week 2, 4 and 5 in the scheduled class time. The tests are all individual assessment tasks. Further details will be provided in lessons leading up to each test.

Feedback will be provided in class and marks in Gradebook.

If students miss this assessment, they must refer to the Special Consideration Policy.

On successful completion you will be able to:

- Explain Physics concepts, within the topics listed in the unit guide, in terms of their underlying physical principles, and describe them in terms of concise mathematical models.
- Analyse the description of a physical problem, be able to 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.
- Analyse real-world problems, be able to develop physical problems based on this analysis, and interpret how numerical results relate to the physical world.
- Identify sources of uncertainty in physical measurements, be able to propagate these uncertainties through calculations, and express results in a meaningful way.
- Use discipline-specific terminology to communicate concepts and ideas relevant to this unit.

Final Examination

Due: **MUIC Final Examination Period**
Weighting: **55%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

The final examination will be of 3 (three) hours plus 10 (ten) minutes reading time duration and will be held during the MUIC Final Examination period.

The final examination is a hurdle requirement. Students must obtain a mark of at least 40% in the final exam in order to pass the unit. If a student is awarded a mark between 30% and 39% inclusive, then the student will be given the chance of a second and final attempt to attain the required level of performance.

A resource sheet of relevant equations and physical constants will be provided with the final exam paper. Students are **not** allowed to bring any other reference materials such as the textbook or notes to the examination venue. Non-programmable calculators **without** text retrieval abilities, and calculators **without** “run”, “exe” or “calc” keys are permitted.

The final exam is an individual assessment task and it consists of short answer calculation questions that may examine any of the content contained within the unit.

Details of the structure and format of the final examination paper will be made available to students prior to the start of the final examination period.

The final examination period spans from Thursday Week 6 until Monday of Week 7, weekend inclusive. This means that examinations and assessments may be held/due on the Saturday during the final examination period and students must be available to take exams and submit assessments on this day.

In cases where a student misses this assessment they must refer to the Special Consideration Policy.

On successful completion you will be able to:

- Explain Physics concepts, within the topics listed in the unit guide, in terms of their underlying physical principles, and describe them in terms of concise mathematical models.
- Analyse the description of a physical problem, be able to 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.
- Analyse real-world problems, be able to develop physical problems based on this analysis, and interpret how numerical results relate to the physical world.
- Identify sources of uncertainty in physical measurements, be able to propagate these uncertainties through calculations, and express results in a meaningful way.

- Use discipline-specific terminology to communicate concepts and ideas relevant to this unit.

Delivery and Resources

Term Dates & College Calendar

Details of key dates during the term can be found on the Important Dates calendar.

Enrolment and Timetables

General timetable information is available via Macquarie University's Timetable page.

Students will be able to enrol in units and register for classes via eStudent and also view their personal timetable. It is the student's responsibility to ensure that classes they have registered for do not clash.

Students are only permitted to attend classes in which they have registered via eStudent, unless they have written approval from the Students Services and Administration Manager. To seek approval, students must email muic@mq.edu.au or speak to a member of the Student Services and Administration Team at E3A Level 2 Reception. Approval will only be granted in exceptional circumstances.

The last day to enrol in units is Tuesday of Week 1. Swapping groups is not possible after the enrolment period has concluded. The last day to enrol and register into classes is Tuesday of Week 1 and this must be finalised by the student in eStudent by the end of the day.

Guest Lecturer Presentations and Workshops

One or two Guest Lecturer Presentations and/or workshops may be scheduled during the term. These sessions will take place outside of regular class time, usually in a lecture theatre on campus. In the session a speaker (usually an expert or well-known academic in the field) will give a presentation on a particular topic related to the unit or field.

While attendance at guest lectures is not compulsory, and content covered is not examinable unless covered in regular classes, students are strongly encouraged to attend these sessions as they will:

- help them to engage with and broaden their understanding of the discipline
- contextualise content covered in class by providing insights into recent research and workplace developments in the field
- provide opportunities for networking
- provide experience of what lectures are like

Specific details including time and venue for Guest Lecturer Presentations and workshops will be posted in iLearn announcements and provided in class.

Recordings of these sessions may also be made available to students via iLearn.

Attendance Requirements – All Students

All students are expected to attend 100% of scheduled class time.

Attendance will be monitored in each lesson & students will be able to see their current attendance percentage to date and potential attendance percentage for each unit they have enrolled in via iLearn.

- **Current attendance Percentage** will reflect the percentage of classes a student has attended so far (based only on the lessons held to date).
- **Potential Attendance Percentage** will reflect the percentage of classes a student can potentially attend by the end of the term, taking into consideration lessons attended and assuming the student also attends all future lessons scheduled (based only on the total number of lessons in the Term).

Where a student is present for a part of a lesson (for example arrives late, leaves early, leaves the class frequently, particularly for lengthy periods) the teacher reserves the right to mark a student absent for that part of the lesson.

In cases of unavoidable non-attendance due to illness or circumstances beyond their control, students should lodge an application for special consideration ask.mq.edu.au within 5 working days and supply relevant supporting documentation, even if they have not missed a formal assessment task. This will ensure that that appropriate records of unavoidable absences can be kept.

Public Holidays and Make-up Lessons

If any scheduled class falls on a public holiday a make-up lesson may be scheduled on an alternate day, usually on a Saturday or a weekday at a time when students do not have other classes scheduled. Alternatively, some make-up lessons might be delivered on-line.

In Term January there will be two public holidays for which make-up lessons will be scheduled.

New Year's Day (01/01/2018): Make up lessons will be scheduled on Saturday 6th January.

Australia Day (26/01/2018): Make up lessons will be scheduled on Saturday 20th January.

Technology Used and Required

- Access to internet (Available on Campus using Macquarie OneNet and in designated E3A Self-Access Computer Laboratories)
- iLab - iLab is Macquarie University's personal computer laboratory on the Internet, enabling students to use the Microsoft Windows applications they require to do their university work from anywhere, anytime, on anything.
- Access to iLearn Access to Macquarie University Library catalogue (MultiSearch)
- Access to Microsoft Office Suite (available in E3A Self-Access Computer Laboratories and via iLab)software downloads page for full instructions.

Bringing your own Device (BYOD)

Macquarie University is BYOD (Bring Your Own Device) friendly and it encourages students to bring their Windows or Mac devices to use on campus and during classes.

In some classes in this unit, you will need to have access to a mobile device, Office applications (Word, Excel and PowerPoint) and an Internet Browser of your choice. If you do not have your own device and computer access is required in a particular lesson, you may be able to borrow a laptop to use for the duration of the lesson.

As a Macquarie University student, you are entitled to free access to Microsoft Office Suite, which you can download for use on your device. Please visit the University's software downloads page for full instructions.

If you do bring your own device, you will need to ensure that it is sufficiently charged as access to power points will not be available in the classrooms.

iLearn

iLearn is Macquarie's online learning management system and a principal teaching and learning resource which will be used throughout the term. Students must access iLearn at least 3 times per week to access important information including:

- Announcements and News Forums - Teaching staff will communicate to the class using iLearn announcements. Announcements may also be emailed to students' Macquarie University email address but students should check the News Forum regularly.
- Attendance – current and potential attendance percentage for the Term.
- Unit Guide and staff contact details
- Set unit readings available through MultiSearch (library).
- Lesson materials and recordings where available
- Learning and teaching activities and resources, questions and solutions
- Assessment instructions, questions, marking criteria and sample tasks
- Assessment submission links such as Turnitin
- Links to support materials and services available at the University
- Evaluation Surveys for the unit

For any resource related iLearn questions contact your teacher. For any technical or support issues using iLearn, please contact the IT helpdesk (Ph. 02 9850 4357) or lodge a ticket using OneHelp.

Useful Study Resources

StudyWise is an iLearn resource created by Learning Skills, which is specifically designed to help you to manage your studies, strengthen your study techniques, write effective assignments and improve your English language proficiency. Once you enrol in StudyWISE, you can access it from your iLearn course list under the category "Student Support".

InfoWise will help you improve your research skills by teaching you how to use MultiSearch, decode citations, identifying key search terms and use advanced search techniques.

Lib Guides provide students with links to electronic sources and websites that are good starting points for research in different fields or disciplines.

MultiSearch will connect you to Macquarie University Library and allow you to search library resources, databases, unit readings and past exam papers

Academic Language and Learning Workshops are designed to help you with Study Skills, Assignment Writing, Referencing and Academic Language.

Research resources provide information about:

- Researching for your assignments
- How to manage your references
- Referencing style guides
- Subject and research guides

Numeracy Support is provided by the Numeracy Centre. Students who can attend these support classes on a drop in basis as required.

Unit Schedule

Week	Course Material	Textbook Chapters and Assessment Due Dates	Laboratory/Practical Lesson Schedule
1	Introduction to mechanics of waves Sound and hearing.	Chapters 16.1 to 16.13, and 17.1 to 17.6	Introductory lesson Lab 1: Unit 1 **Assignment 1 released**
2	Sound and hearing continue. Nature and propagation of light Pre-census Feedback	Chapters 17.1 to 17.6, 17.8 to 17.10, 33.1 to 33.5, and 33.7 to 33.9 **Test 1**	Lab 2: Unit 2 Lab 3: Experiment
3	Geometrical optics and optical instruments Interference	Chapters 34.1 to 34.9, and 35.1 to 35.8	Lab 4: Experiment Lab 5: Experiment

4	Diffraction Temperature, heat, thermal properties of matter, and heat capacities	Chapters 36.1 to 36.5, 36.7, and 18.1 to 18.9 **Test 2**	Lab 6: Experiment Lab 7: Experiment **Assignment 2 released**
5	First law of thermodynamics, and heat capacities of ideal gases Relativity	Chapters 18.10 to 18.12, 19.1 to 19.11, and 37.1 to 37.9 **Test 3**	Lab 8: Experiment Lab 9: Experiment
6	Photons, electrons, atoms, the wave nature of particles, and nuclear physics	Chapters 38.1 to 38.6, 38.8, 39.8, 42.1 to 42.6, and 43.1 to 43.6	Revision Make up labs for students with approved DTSs
	FINAL EXAM		The final examination period spans from Thursday Week 6 until Monday of Week 7, weekend inclusive. This means that examinations and assessments may be held/ due on the Saturday during the final examination period and students must be available to take exams and submit assessments on this day.

Learning and Teaching Activities

Lessons

There will be lessons where the content of the unit will be explained, example problems will be solved and physics principles demonstrated.

Practical lessons

There will be practical lessons each week where students will work through problems related to the previous week's course content.

Laboratory

Laboratory lessons will be held during the 6 weeks of the term; each lesson will be three hours long. During these students will engage in practical exercises to further their understanding of the physics concepts discussed in other lessons and to develop their skills at measurement, analysis and verification of physical models.

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). 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.)*

Undergraduate students seeking more policy resources can visit the 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 (https://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 shown in *iLearn*, 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.

Academic Honesty

Using the work or ideas of another person, whether intentionally or not, and presenting them as your own without clear acknowledgement of the source is called Plagiarism.

Macquarie University promotes awareness of information ethics through its Academic Honesty Policy. This means that:

- all academic work claimed as original must be the work of the person making the claim
- all academic collaborations of any kind must be acknowledged
- academic work must not be falsified in any way
- when the ideas of others are used, these ideas must be acknowledged appropriately.

All breaches of the Academic Honesty Policy are serious and penalties apply. Students should be aware that they may fail an assessment task, a unit or even be excluded from the University for breaching the Academic Honesty Policy.

Assessment Policy

Students should familiarise themselves with their responsibilities under the Assessment Policy, and notably Schedule 4 (Final Examination Requirements).

Final Examination Script Viewings

A student may request to view their final examination script once results have been released but scripts remain the property of Macquarie University.

Students should view their final examination paper prior to submitting a grade appeal, if this is relevant to their case. The viewing will be conducted in a secure location under supervision.

To request a final examination script viewing, please email: muic@mq.edu.au and write 'script viewing' in the subject heading.

Scripts may be reviewed for up to 6 months following the results release date for the relevant Term.

Grade Appeals

A student who has been awarded a final grade for a unit has the right to appeal that grade as outlined in the Grade Appeal Policy. Grade appeals apply to the final mark and grade a student receives for a unit of study. They do not apply to results received for individual assessment tasks.

Grade appeals must be submitted via ask.mq.edu.au within 20 working days from the published result date for the relevant unit. Before submitting a Grade Appeal, please ensure that you read the Grade Appeal Policy and note valid grounds for appeals.

Students are expected to seek feedback on individual assessment tasks prior to the award of a final grade. Students also have the right to request generic feedback from the teaching staff on their overall performance in the unit, including in a final examination. This can be done at any time in the six month period starting from the day on which the final grade of the relevant unit is published.

Course Progression

The College closely monitors students' academic progress as per the Progression Policy for Programs delivered by Macquarie University International College.

To maintain Satisfactory Academic Progress, a student must successfully complete (pass) 50% or more of their enrolled units in a Term of study. To successfully complete a unit, students must obtain a passing grade and meet any other requirements to pass listed in the unit guide.

Students who fail to make Satisfactory Academic Progress will be classified as "at risk" and will be notified in writing. At-risk students may be required to undergo academic counselling, undertake certain initiatives or have conditions placed upon their enrolment to help them make satisfactory progress.

Students must also pass 50% or more of the units in 2 or more terms in order to meet Minimum Rate of Progress (MRP) requirements. A student is deemed not to be making Minimum Rate of Progress if they fail more than 50% of their enrolled units in two consecutive Terms of study, or if they have failed more than 50% of their units after studying two or more terms.

Any domestic student who has been identified as not meeting Minimum Rate of Progress requirements will be issued with an Intention to Exclude letter and may subsequently be excluded from the program.

Any international student who has been identified as not meeting MRP will be subject to exclusion from the program and be issued with an Intention to Report letter and may subsequently be reported to the Department of Immigration and Border Protection (DIBP) for not meeting visa requirements. International students must comply with the Progression Policy of the College in order to meet the conditions of their visa.

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) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

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

IT Help

For help with University computer systems and technology, visit 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.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Assessment tasks

- Laboratory work
- Assignments
- Tests
- Final Examination

Learning and teaching activities

- There will be practical lessons each week where students will work through problems related to the previous week's course content.

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- Analyse the description of a physical problem, be able to 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.
- Analyse real-world problems, be able to develop physical problems based on this analysis, and interpret how numerical results relate to the physical world.

Assessment tasks

- Laboratory work
- Assignments
- Final Examination

Learning and teaching activities

- Laboratory lessons will be held during the 6 weeks of the term; each lesson will be three hours long. During these students will engage in practical exercises to further their understanding of the physics concepts discussed in other lessons and to develop their skills at measurement, analysis and verification of physical models.

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they

participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Assessment task

- Tests

Learning and teaching activity

- There will be lessons where the content of the unit will be explained, example problems will be solved and physics principles demonstrated.
- There will be practical lessons each week where students will work through problems related to the previous week's course content.
- Laboratory lessons will be held during the 6 weeks of the term; each lesson will be three hours long. During these students will engage in practical exercises to further their understanding of the physics concepts discussed in other lessons and to develop their skills at measurement, analysis and verification of physical models.

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Explain Physics concepts, within the topics listed in the unit guide, in terms of their underlying physical principles, and describe them in terms of concise mathematical models.
- Analyse the description of a physical problem, be able to 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.
- Record experimental data, display data graphically, analyse data, and present conclusions in a clear, concise, and systematic manner.
- Identify sources of uncertainty in physical measurements, be able to propagate these uncertainties through calculations, and express results in a meaningful way.

- Use discipline-specific terminology to communicate concepts and ideas relevant to this unit.

Assessment tasks

- Laboratory work
- Assignments
- Tests
- Final Examination

Learning and teaching activities

- There will be lessons where the content of the unit will be explained, example problems will be solved and physics principles demonstrated.
- Laboratory lessons will be held during the 6 weeks of the term; each lesson will be three hours long. During these students will engage in practical exercises to further their understanding of the physics concepts discussed in other lessons and to develop their skills at measurement, analysis and verification of physical models.

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Record experimental data, display data graphically, analyse data, and present conclusions in a clear, concise, and systematic manner.
- Identify sources of uncertainty in physical measurements, be able to propagate these uncertainties through calculations, and express results in a meaningful way.

Assessment tasks

- Laboratory work
- Assignments
- Tests
- Final Examination

Learning and teaching activities

- There will be lessons where the content of the unit will be explained, example problems

will be solved and physics principles demonstrated.
- There will be practical lessons each week where students will work through problems related to the previous week's course content.
- Laboratory lessons will be held during the 6 weeks of the term; each lesson will be three hours long. During these students will engage in practical exercises to further their understanding of the physics concepts discussed in other lessons and to develop their skills at measurement, analysis and verification of physical models.

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Explain Physics concepts, within the topics listed in the unit guide, in terms of their underlying physical principles, and describe them in terms of concise mathematical models.
- Analyse the description of a physical problem, be able to 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.
- Analyse real-world problems, be able to develop physical problems based on this analysis, and interpret how numerical results relate to the physical world.
- Record experimental data, display data graphically, analyse data, and present conclusions in a clear, concise, and systematic manner.

Assessment tasks

- Laboratory work
- Assignments
- Tests
- Final Examination

Learning and teaching activities

- There will be lessons where the content of the unit will be explained, example problems will be solved and physics principles demonstrated.
- There will be practical lessons each week where students will work through problems

related to the previous week's course content.
- Laboratory lessons will be held during the 6 weeks of the term; each lesson will be three hours long. During these students will engage in practical exercises to further their understanding of the physics concepts discussed in other lessons and to develop their skills at measurement, analysis and verification of physical models.

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Explain Physics concepts, within the topics listed in the unit guide, in terms of their underlying physical principles, and describe them in terms of concise mathematical models.
- Analyse the description of a physical problem, be able to 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.
- Analyse real-world problems, be able to develop physical problems based on this analysis, and interpret how numerical results relate to the physical world.
- Record experimental data, display data graphically, analyse data, and present conclusions in a clear, concise, and systematic manner.
- Use discipline-specific terminology to communicate concepts and ideas relevant to this unit.

Assessment tasks

- Laboratory work
- Assignments
- Tests
- Final Examination

Learning and teaching activities

- There will be practical lessons each week where students will work through problems related to the previous week's course content.
- Laboratory lessons will be held during the 6 weeks of the term; each lesson will be three

hours long. During these students will engage in practical exercises to further their understanding of the physics concepts discussed in other lessons and to develop their skills at measurement, analysis and verification of physical models.

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcome

- Analyse real-world problems, be able to develop physical problems based on this analysis, and interpret how numerical results relate to the physical world.

Assessment tasks

- Laboratory work
- Assignments
- Tests
- Final Examination

Learning and teaching activities

- There will be lessons where the content of the unit will be explained, example problems will be solved and physics principles demonstrated.

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcome

- Analyse real-world problems, be able to develop physical problems based on this analysis, and interpret how numerical results relate to the physical world.

Assessment tasks

- Laboratory work

- Assignments
- Tests
- Final Examination

Learning and teaching activities

- There will be lessons where the content of the unit will be explained, example problems will be solved and physics principles demonstrated.

Changes from Previous Offering

Students will have 3 more hours of face-to-face contact than in previous terms.

Course Contact Hours

Weekly face-to-face contact for this unit will be 16 hours (96 hours per term).

There will be 7 lessons per week consisting of 5 theory lessons (10 hours) and 2 workshops in the physics laboratory (6 hours).

Laboratory Details

Laboratory Requirements

The laboratory component is considered an essential component of learning and so counts for an appreciable percentage of the final assessment (20%).

The laboratory work is designed to introduce students to some of the basic skills and techniques that are used in experimental physical science. Some of the activities in the laboratory may not relate directly to textbook material. This is because the laboratory activities are intended not only to illustrate physical concepts but also to introduce students to some techniques of measurement.

By providing students with instructional material in the form of the Laboratory Notes manual, together with help from the laboratory demonstrators, the laboratory work has been designed to be completed solely at the labs. The lab work is advantageous for students to become familiar with a topic in an experimental situation before they discuss it in face-to-face lessons. That is often the case in real life! All the information students need for each experiment is contained in the Laboratory Manual and in the Pre-lab work (exercises to be completed **before** students attend the lab sessions). There is no need to spend a long time outside the laboratory hours in preparation; however, a quick read through the lab notes beforehand will allow students to make better use of their time in the laboratory.

Location of the 100-level Physics Laboratory

The laboratory is located on the ground floor of building E7B, at the NE corner (room 114). Entry is from the courtyard at the opposite end to the main staircase.

What to Bring

Prior to attending the lab sessions, students will need to study the content of the relevant

Physics IB Laboratory Notes which are available online in iLearn. Students must also complete the relevant Pre-lab work.

Students are also required to buy and use a standard "science book" (with ruled and graph pages, not spiral bound). ALL LABORATORY WORK MUST BE RECORDED DIRECTLY INTO THE LABORATORY NOTEBOOK. Loose sheets of paper must not be used. If students feel that their notes are incomprehensible or untidy, they may rewrite a more legible report in the same book and simply cross out the original notes.

Both these items (the laboratory notebook and manual) should be brought by students to the first lab session.

Laboratory Attendance Requirements

Students are required to attend every scheduled laboratory session. If students miss a session without a written explanation, then they will **not** be considered to have made a serious attempt at the laboratory component of the unit. Each time students attend the laboratory they must sign in and out (legibly) in the attendance book.

If students miss a laboratory session, they **must lodge a "disruption to studies"** request, they can start this process at ask.mq.edu.au. If the disruption to studies is granted, the students will need to attend the supplementary lab sessions available during week 6 (no more than two make-up labs will be offered).

How to use a Laboratory Notebook

More details are on page (ii) of the Laboratory Notes manual.

The notebook should show students' collected data and the calculations and graphs resulting from the data. At the end of each section, students must summarise the findings and answer any questions posed in the guiding notes.

At the completion of each laboratory session, students must show their books to the laboratory supervisor who will check them and collect them for marking. The marker (the lab supervisor or one of the laboratory demonstrators) will be checking the students' books to see whether they have kept a satisfactory record of what they have done and what they have concluded. The marked notebooks will be available at the start of the subsequent scheduled laboratory. Students must check their books for comments from the markers as this will help them to refine the laboratory technique (and increase the laboratory mark). The **notebook** will be kept in the laboratory, and **must not be removed** from the laboratory at any time; this includes any previously filled notebook.

Laboratory Assessment

Details of the laboratory assessment will be outlined in the first lab session.

Laboratory Safety

Students are required to follow all safety guidelines given in the lab manual, and as outlined by their lab supervisor in the workplace and safety session delivered during the introductory lab session. **Food and drink cannot be taken into the laboratory and students without suitable covered footwear will be refused admission**.

Laboratory Schedule

Introduction to laboratories start in the first week of the term. The schedule of labs is posted in the lab and on the WPHY143 iLearn page. Students must attend the laboratory session in which they are enrolled.

Unit Specific Texts and Materials

The following texts have been prescribed for this unit.

Required Textbook:

Halliday, Resnick, and Walker, 2014, Fundamentals of Physics, extended 10th edition (with Wiley Plus).

The content of the unit is based on the following chapters of the textbook:

• Waves: Chapters 16 and 17

• Light: Chapters 33 to 36

• Heat and Thermodynamics: Chapters 18 to 19

• Relativity: Chapter 37

• Atomic and Quantum Physics: Chapters 38 to 39

• Nuclear Physics: Chapter 42 to 43

Required Resources

A copy of the WPHY143 Laboratory Manual is available on iLearn.