UNSW Course Outline

PHYS9110 Everyday Physics for Teachers - 2024

Published on the 02 Sep 2024

General Course Information

Course Code : PHYS9110
Year : 2024
Term : Term 3
Teaching Period : T3
Is a multi-term course? : No
Faculty : Faculty of Science
Academic Unit : School of Physics
Delivery Mode : Online
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This is a fully online course that looks at the physics behind common objects. Physics topics addressed in this course include basic mechanics, properties of waves, Archimedes principle and fluid flow. Basic experimental methods will be covered through simulations and simple

experiments that can be conducted at home. The course is aimed at qualified science teachers. It serves as the introductory unit in the Graduate Certificate in Physics for Science Teachers.

Course Aims

The aim of this course is to introduce students to physics as well as showing them how to contextualize physics content to make it relevant and interesting for school students.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Safely plan and conduct physics experiments using common household equipment, analyse and present the results.
CLO2 : Design and critique physics experiments suitable for high school students.
CLO3 : Apply critical thinking skills in a range of conceptual physical situations involving waves, buoyancy and fluid flow.
CLO4 : Use appropriate mathematical techniques to solve problems related to everyday life, involving waves, buoyancy and fluid flow.

Course Learning Outcomes	Assessment Item
CLO1 : Safely plan and conduct physics experiments using common household equipment, analyse and present the results.	• Final report • Investigations
CLO2 : Design and critique physics experiments suitable for high school students.	• Final report
CLO3 : Apply critical thinking skills in a range of conceptual physical situations involving waves, buoyancy and fluid flow.	• Final Examination
CLO4 : Use appropriate mathematical techniques to solve problems related to everyday life, involving waves, buoyancy and fluid flow.	• Final Examination • Investigations

Learning and Teaching Technologies

Moodle - Learning Management System | Open Learning

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Final report Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: Draft: 11:59 PM Sunday week 7. Peer review: 11:59 PM Sunday week 9. Final: 11:59 PM Sunday week 10.
Final Examination Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: Not Applicable
Investigations Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: 11:59 PM Sunday weeks 4, 6, 8.

Assessment Details

Final report

Assessment Overview

You will design and conduct your own experiment based on a physical phenomenon you find interesting. You will produce a report and a worksheet suitable for school students based on this experiment. There are a few steps in the process you will follow:

- You will check the topic you have chosen with the lecturer.
- You will submit a draft of your report for peer review.
- You will review the work of three peers, providing constructive feedback.
- You will submit a final version of your report and worksheet.

You will be marked on the quality of the feedback you give your peers and the quality of your final report and worksheet.

Course Learning Outcomes

- CLO1 : Safely plan and conduct physics experiments using common household equipment, analyse and present the results.
- CLO2 : Design and critique physics experiments suitable for high school students.

Detailed Assessment Description

As part of PHYS9110, you need to produce a report about the physics behind an everyday phenomenon of interest to you. As part of this report, you will need to construct an investigation that demonstrates the physics behind the phenomenon. You can look construct an experiment around the physics covered in this course or another branch of physics but you need to relate it to an everyday object or phenomenon. You should choose something that you could use with students (any high school year level is fine). You will need to include a description of how you will

use this with your students.

Assessment Length

2500-4000 words

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Generative AI Permission Level

Simple Editing Assistance

In completing this assessment, you are permitted to use standard editing and referencing functions in the software you use to complete your assessment. These functions are described below. You must not use any functions that generate or paraphrase passages of text or other media, whether based on your own work or not.
If your Convenor has concerns that your submission contains passages of AI-generated text or media, you may be asked to account for your work. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.
For more information on Generative AI and permitted use please see here.

Final Examination

Assessment Overview

You will sit a two hour open-book exam with five questions assessing the theory taught during the course. The exam will consist of a combination of conceptual and calculation based questions. You will sit this exam at your school or another location approved by course staff.

Course Learning Outcomes

- CLO3 : Apply critical thinking skills in a range of conceptual physical situations involving waves, buoyancy and fluid flow.
- CLO4 : Use appropriate mathematical techniques to solve problems related to everyday life, involving waves, buoyancy and fluid flow.

Assessment Length

2 hours + reading and uploading time

Assignment submission Turnitin type

Not Applicable

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.
For more information on Generative AI and permitted use please see here.

Investigations

Assessment Overview

You will be expected to complete three laboratory experiments (each weighed equally) using common household equipment during the course. These experiments will be due after the relevant content has been covered in the online lectures.

Course Learning Outcomes

- CLO1 : Safely plan and conduct physics experiments using common household equipment, analyse and present the results.
- CLO4 : Use appropriate mathematical techniques to solve problems related to everyday life, involving waves, buoyancy and fluid flow.

Detailed Assessment Description

There are three investigations that are based on the following topics: measuring the refractive index of water, measuring the speed of sound in air, and Archimedes principle.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Generative AI Permission Level

Simple Editing Assistance

In completing this assessment, you are permitted to use standard editing and referencing functions in the software you use to complete your assessment. These functions are described below. You must not use any functions that generate or paraphrase passages of text or other media, whether based on your own work or not.
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General Assessment Information

The standard late submission penalties apply to all assessment except tests and exams.

Grading Basis

Standard

Requirements to pass course

Students must achieve a total score of 50 in the course to pass.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 9 September - 15 September	Topic	How do speed cameras work? This topic looks at waves, simple harmonic motion, and the Doppler effect.
Week 2 : 16 September - 22 September	Topic	How do speed cameras work? This topic looks at waves, simple harmonic motion, and the Doppler effect.
Week 3 : 23 September - 29 September	Topic	How do glasses(spectacles) work? This builds on the understanding of waves from the first topic to look at optics, reflection, refraction, lenses, and mirrors.
Week 4 : 30 September - 6 October	Topic	How do glasses(spectacles) work? This builds on the understanding of waves from the first topic to look at optics, reflection, refraction, lenses, and mirrors.
	Assessment	Refractive index investigation
Week 5 : 7 October - 13 October	Topic	Why do musical instruments make sounds? This builds further on the understanding of waves. The law of superposition, standing waves, power and intensity, sound levels and beats are considered.
Week 6 : 14 October - 20 October	Topic	Why do musical instruments make sounds? This builds further on the understanding of waves. The law of superposition, standing waves, power and intensity, sound levels and beats are considered.
	Assessment	Speed of sound investigation
Week 7 : 21 October - 27 October	Topic	How does a hot air balloon work? This topic looks at weight, air resistance, Archimedes principle and buoyancy and the ideal gas law.
	Assessment	Draft of final report
Week 8 : 28 October - 3 November	Topic	How does a hot air balloon work? This topic looks at weight, air resistance, Archimedes principle and buoyancy and the ideal gas law.
	Assessment	Archimedes principle investigation
Week 9 : 4 November - 10 November	Topic	What determines how fast a river flows? This topic looks at fluids. It covers pressure changes, ideal fluid flow, volume rate of flow, Bernoulli's equation, applications of these to biological systems and dams to store potential energy.
	Assessment	Peer reviews of final reports
Week 10 : 11 November - 17 November	Topic	What determines how fast a river flows? This topic looks at fluids. It covers pressure changes, ideal fluid flow, volume rate of flow, Bernoulli's equation, applications of these to biological systems and dams to store potential energy.
	Assessment	Final report

Attendance Requirements

Not Applicable - as no class attendance is required

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Kate Jackson		OMB G61G		Email to arrange a time	Yes	No
	Jonathhan Ko		OMB G61		Email to arrange a time	No	Yes

Other Useful Information

Academic Information

Upon your enrolment at UNSW, you share responsibility with us for maintaining a safe, harmonious and tolerant University environment.

You are required to:

- Comply with the University's conditions of enrolment.
- Act responsibly, ethically, safely and with integrity.
- Observe standards of equity and respect in dealing with every member of the UNSW community.
- Engage in lawful behaviour.
- Use and care for University resources in a responsible and appropriate manner.
- Maintain the University's reputation and good standing.

For more information, visit the UNSW Student Code of Conduct Website.

Academic Honesty and Plagarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.
Further information about referencing styles can be located at https://student.unsw.edu.au/referencing

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage. At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity, plagiarism and the use of AI in assessments can be located at:

- The Current Students site,
- The ELISE training site, and
- The Use of AI for assessments site.

The Student Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct

Submission of Assessment Tasks

Penalty for Late Submissions

UNSW has a standard late submission penalty of:

- 5% per day,
- for all assessments where a penalty applies,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Any variations to the above will be explicitly stated in the Course Outline for a given course or assessment task.

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

Special Consideration

If circumstances prevent you from attending/completing an assessment task, you must officially apply for special consideration, usually within 3 days of the sitting date/due date. You can apply by logging onto myUNSW and following the link in the My Student Profile Tab. Medical documentation or other documentation explaining your absence must be submitted with your application. Once your application has been assessed, you will be contacted via your student email address to be advised of the official outcome and any actions that need to be taken from there. For more information about special consideration, please visit: https://student.unsw.edu.au/special-consideration

Important note: UNSW has a "fit to sit/submit" rule, which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit to do so and cannot later apply for Special Consideration. This is to ensure that if you feel unwell or are faced with significant

circumstances beyond your control that affect your ability to study, you do not sit an examination or submit an assessment that does not reflect your best performance. Instead, you should apply for Special Consideration as soon as you realise you are not well enough or are otherwise unable to sit or submit an assessment.

Faculty-specific Information

Additional support for students

- The Current Students Gateway
- Student Support
- Academic Skills and Support
- Student Wellbeing, Health and Safety
- Equitable Learning Services
- UNSW IT Service Centre
- Science EDI Student Initiatives, Offerings and Guidelines