



UNSW Course Outline

ZPEM2401 Australian Waters and their Dynamics - 2024

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General Course Information

Course Code : ZPEM2401

Year : 2024

Term : Semester 1

Teaching Period : Z1

Is a multi-term course? : No

Faculty : UNSW Canberra

Academic Unit : UC Science

Delivery Mode : In Person

Delivery Format : Standard

Delivery Location : UNSW Canberra at ADFA

Campus : UNSW Canberra

Study Level : Undergraduate

Units of Credit : 6

Useful Links

[Handbook Class Timetable](#)

Course Details & Outcomes

Course Description

This course will examine the major currents around Australia and their influence on fisheries, coastal communities and climate. These currents include the Leeuwin Current, Eastern Australian Current, Antarctic Circumpolar Current, and the Indonesian Throughflow. Before investigating the

currents, the basic principles of ocean properties (potential temperature, salinity, and density) and ocean forces (gravity, pressure, pressure gradients, Coriolis, friction) will be examined along with the primary ocean dynamics and their balances (geostrophic flow and Ekman transport). This will provide understanding of the forces causing and influencing the currents and provide a framework for the Australian currents to be discussed. The basics of waves and tides will also be outlined, including the tides around Australia. There will be an oceanography field school.

Course Aims

This course aims to provide you with a basic understanding of:

- The physical properties of sea water (including salinity, temperature, density, water column stability, and double diffusion)
- Ocean dynamics (including Ekman and geostrophic balances, and inertial oscillations).
- The currents and oceanographic conditions around Australia

Relationship to Other Courses

Some lectures from this course serves as an expansion of certain lectures from ZPEM 1402.

Course Learning Outcomes

Course Learning Outcomes
CL01 : Explain the theory of, and solve relevant problems on, the basic principles of ocean properties, ocean forces, waves and tides, and primary ocean dynamics and their balances.
CL02 : Explain the theory of, and solve relevant problems on, the major currents around Australia and their influence on fisheries, coastal communities and climate.
CL03 : Investigate oceanography concepts in laboratory experiments and field school including data processing and analysis techniques to understand, characterise, and communicate oceanographic physical processes.

Course Learning Outcomes	Assessment Item
CL01 : Explain the theory of, and solve relevant problems on, the basic principles of ocean properties, ocean forces, waves and tides, and primary ocean dynamics and their balances.	<ul style="list-style-type: none">• Laboratory• Exam• Field school• Two tests
CL02 : Explain the theory of, and solve relevant problems on, the major currents around Australia and their influence on fisheries, coastal communities and climate.	<ul style="list-style-type: none">• Laboratory• Exam• Two tests
CL03 : Investigate oceanography concepts in laboratory experiments and field school including data processing and analysis techniques to understand, characterise, and communicate oceanographic physical processes.	<ul style="list-style-type: none">• Field school• Laboratory

Learning and Teaching Technologies

Moodle - Learning Management System | EdStem | Echo 360

Learning and Teaching in this course

Student Learning Outcomes

At the successful conclusion of this course students will be able to:

L01. Explain the theory of, and solve relevant problems on, the basic principles of ocean properties, ocean forces, waves and tides, and primary ocean dynamics and their balances.

L02. Explain the theory of, and solve relevant problems on, the major currents around Australia and their influence on fisheries, coastal communities and climate.

L03. Investigate oceanography concepts in laboratory experiments and field school including data processing and analysis techniques to understand, characterise, and communicate oceanographic physical processes.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Laboratory Assessment Format: Group	20%	Start Date: Not Applicable Due Date: Not Applicable Post Date: 30/06/2024 10:00 AM
Exam Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: Not Applicable
Field school Assessment Format: Group	20%	Start Date: 18/04/2024 12:00 AM Due Date: 11/05/2024 12:00 AM Post Date: 11/05/2024 12:00 PM
Two tests Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Not Applicable Post Date: 31/07/2024 12:00 PM

Assessment Details

Laboratory

Assessment Overview

Not specified

Course Learning Outcomes

- CL01 : Explain the theory of, and solve relevant problems on, the basic principles of ocean properties, ocean forces, waves and tides, and primary ocean dynamics and their balances.
- CL02 : Explain the theory of, and solve relevant problems on, the major currents around Australia and their influence on fisheries, coastal communities and climate.
- CL03 : Investigate oceanography concepts in laboratory experiments and field school including data processing and analysis techniques to understand, characterise, and communicate oceanographic physical processes.

Detailed Assessment Description

This course includes two lab sessions, collectively contributing to 20% of the total grade.

Assessment Length

3hrs

Submission notes

The Laboratory report is typically due one week after the lab session. However, extensions may be granted in certain special circumstances.

Assessment information

The lab booklet can be downloaded from the moodle.

Assignment submission Turnitin type

Not Applicable

Exam

Assessment Overview

Not specified

Course Learning Outcomes

- CL01 : Explain the theory of, and solve relevant problems on, the basic principles of ocean properties, ocean forces, waves and tides, and primary ocean dynamics and their balances.
- CL02 : Explain the theory of, and solve relevant problems on, the major currents around Australia and their influence on fisheries, coastal communities and climate.

Detailed Assessment Description

It will be a 2 hr exam

Assessment Length

2hrs

Submission notes

It is supposed to be submitted immediately after the exam.

Assessment information

It is supposed to be submitted immediately after the exam.

Assignment submission Turnitin type

Not Applicable

Field school

Course Learning Outcomes

- CL01 : Explain the theory of, and solve relevant problems on, the basic principles of ocean properties, ocean forces, waves and tides, and primary ocean dynamics and their balances.
- CL03 : Investigate oceanography concepts in laboratory experiments and field school

including data processing and analysis techniques to understand, characterise, and communicate oceanographic physical processes.

Detailed Assessment Description

Field school will be conducted during 16th - Fri 19th April 2024

Assessment Length

4days

Submission notes

The full report on the field school is supposed to be submitted in a week after the field school

Assessment information

The full report on the field school is supposed to be submitted in a week after the field school

Assignment submission Turnitin type

Not Applicable

Two tests

Assessment Overview

Not specified

Course Learning Outcomes

- CL01 : Explain the theory of, and solve relevant problems on, the basic principles of ocean properties, ocean forces, waves and tides, and primary ocean dynamics and their balances.
- CL02 : Explain the theory of, and solve relevant problems on, the major currents around Australia and their influence on fisheries, coastal communities and climate.

Detailed Assessment Description

There will be two in class test.

Assessment Length

1hr

Submission notes

It should be submitted right after the test

Assessment information

It should be submitted right after the test

Assignment submission Turnitin type

Not Applicable

General Assessment Information

All marks obtained for assessment items during the session are provisional. The final mark as published by the university following the assessment review group meeting is **the only official mark**.

The field school will be conducted during the 2nd week of the mid-semester break. The field school report is due at the end of the field school.

Late Submission of Assessment

Unless prior arrangement is made with the lecturer or a formal application for special consideration is submitted, a penalty of 5% of the total available mark for the assessment will apply for each day that an assessment item is late up to a maximum of 5 days (120 hours) after which an assessment can no longer be submitted and a grade of 0 will be applied.

Missed Assessment:

Students who miss assessments due to unforeseeable circumstances must formally apply for special consideration as soon as is practically possible and also inform the lecturer.

Use of Generative Artificial Intelligence (AI)

You can use generative AI software in this course to the extent specified in the assessment instructions. Any output of generative software within your assessment must be attributed with full referencing.

If the outputs of generative AI such as ChatGPT form part of your submission and is not appropriately attributed, it will be regarded as serious academic misconduct and subject to the standard penalties, which may include 00FL, suspension and exclusion.

* To cite: OpenAI (Year Accessed). ChatGPT. OpenAI. <https://openai.com/models/chatgpt/>

* Please note that the outputs from these tools are not always accurate, appropriate, nor properly referenced. You should ensure that you have moderated and critically evaluated the outputs from generative AI tools such as ChatGPT before submission.

Grading Basis

Standard

Requirements to pass course

50 out of 100

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 26 February - 1 March	Lecture	Dynamics
Week 2 : 4 March - 8 March	Lecture	Dynamics
Week 3 : 11 March - 15 March	Lecture	Dynamics (Monday lost)
Week 4 : 18 March - 22 March	Lecture	Dynamics
Week 5 : 25 March - 29 March	Lecture	Dynamics (Friday Lost)
	Laboratory	
Week 6 : 1 April - 5 April	Lecture	Dynamics
	Assessment	Class test 1
Week 7 : 22 April - 26 April	Lecture	Dynamics
Week 8 : 29 April - 3 May	Lecture	Regional Oceanography
	Laboratory	
Week 9 : 6 May - 10 May	Lecture	Regional Oceanography
Week 10 : 13 May - 17 May	Lecture	Regional Oceanography
Week 11 : 20 May - 24 May	Lecture	Regional Oceanography
Week 12 : 27 May - 31 May	Lecture	Regional Oceanography
	Assessment	Class test2
Week 13 : 3 June - 7 June	Lecture	Revision

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings. Students are indeed expected to attend all lectures, field school, laboratory sessions and assessments unless their absence has been approved by the course coordinator. Students who have missed assessments or a laboratory, or expect to miss such a requirement, must inform the course coordinator by email at the earliest practicable date. In typical circumstances of missed assessments, a formal application for Special Consideration via the prescribed University procedure is appropriate. Alternative assessment can then be arranged. Otherwise, in the case of absence a mark of zero will be awarded for the assessment

General Schedule Information

There are three classes per week and two lab sessions for the semester. You are expected to attend all scheduled classes.

Classes: Monday 1000-1100, Thursday 1100-1200 and Friday 1100-1200 in P25 (Bldg 26) unless online or otherwise advised.

Laboratory Sessions: Two 3-hour laboratory sessions scheduled Wednesday 1400-1700 in Physics lab 2A, (Bldg 26). Laboratory sessions are currently scheduled for weeks 5 and 8. A field school is scheduled from 16-19 April in Batemans Bay, NSW.

Course Resources

Prescribed Resources

1. Pond and Pickard, 2013, *Introductory Dynamical Oceanography*
2. Stewart, 2008, *Introduction to Physical Oceanography*, a free download: [Introduction to Physical Oceanography textbook](#)
3. Tomczak & Godfrey 2003, *Regional Oceanography*, Daya Publishing house, 2nd edition, a free download: [Regional Oceanography textbook](#)
4. MATLAB from MathWorks: A Mathematical analysis and plotting software.
5. Casio FX82AU scientific calculator

Recommended Resources

1. Open University, 2001, *Ocean Circulation*, Butterworth and Heinemann, Oxford, 2nd edition, 2001.
2. Open University, 1999, *Waves, Tides and Shallow Water Processes*, Butterworth and Heinemann, Oxford, 2nd edition, 1999.

Additional Costs

none

Course Evaluation and Development

One of the key priorities in the 2025 Strategy for UNSW is a drive for academic excellence in education. One of the ways of determining how well UNSW is progressing towards this goal is by listening to our own students. Students will be asked to complete the myExperience survey towards the end of this course.

Students can also provide feedback during the semester via: direct contact with the lecturers; the "On-going Student Feedback" link in Moodle; SSCI Student-Staff Liaison Committee meetings; and informal feedback conducted by staff. Student opinions really do make a difference. Refer to the Moodle site for this course to see how the feedback from previous students has contributed to the course development.

Important note: *Students are reminded that any feedback provided should be constructive and professional and that they are bound by the [Student Code of Conduct Policy](#).*

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Xiao Hua Wang		G21 Building 26	(2) 5114 5044	Monday-Friday	No	Yes
Lecturer	zhibing li		G19, Building 26	0420215236	Monday-Friday	No	No

Other Useful Information

Academic Information

Course Evaluation and Development

One of the key priorities in the 2025 Strategy for UNSW is a drive for academic excellence in education. One of the ways of determining how well UNSW is progressing towards this goal is by listening to our own students. Students will be asked to complete the myExperience survey towards the end of each course.

Students can also provide feedback during the semester via: direct contact with the lecturer, the “On-going Student Feedback” link in Moodle, Student-Staff Liaison Committee meetings in schools, informal feedback conducted by staff, and focus groups (where applicable). Student opinions really do make a difference. Refer to the Moodle site for your course to see how the feedback from previous students has contributed to the course development.

Important note: Students are reminded that any feedback provided should be constructive and professional and that they are bound by the Student Code of Conduct.

<https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf>

Equitable Learning Services (ELS)

Students living with neurodivergent, physical and/or mental health conditions or caring for someone with these conditions may be eligible for support through the Equitable Learning Services team. Equitable Learning Services is a free and confidential service that provides practical support to ensure your mental or physical health conditions do not adversely affect your studies.

Our team of dedicated **Equitable Learning Facilitators (ELFs)** are here to assist you through this

process. We offer a number of services to make your education at UNSW easier and more equitable.

Further information about ELS for currently enrolled students can be found at: <https://www.student.unsw.edu.au/equitable-learning>

Academic Honesty and Plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW staff and students have a responsibility to adhere to this principle of academic integrity. All students are expected to adhere to UNSW's Student Code of Conduct. Find relevant information at: [Student Code of Conduct \(unsw.edu.au\)](https://www.student.unsw.edu.au/student-code-of-conduct)

Plagiarism undermines academic integrity and is not tolerated at UNSW. It is defined as using the words or ideas of others and passing them off as your own, and can take many forms, from deliberate cheating to accidental copying from a source without acknowledgement.

For more information, please refer to the following:

<https://student.unsw.edu.au/plagiarism>

Submission of Assessment Tasks

Special Consideration

Special Consideration is the process for assessing and addressing the impact on students of short-term events, that are beyond the control of the student, and that affect performance in a specific assessment task or tasks.

Applications for Special Consideration will be accepted in the following circumstances only:

- Where academic work has been hampered to a substantial degree by illness or other cause;
- The circumstances are unexpected and beyond the student's control;
- The circumstances could not have reasonably been anticipated, avoided or guarded against by the student; and either:
 - (i) they occurred during a critical study period and was 3 consecutive days or more duration, or a total of 5 days within the critical study period; or
 - (ii) they prevented the ability to complete, attend or submit an assessment task for a

specific date (e.g. final exam, in class test/quiz, in class presentation)

Applications for Special Consideration must be made as soon as practicable after the problem occurs and at the latest within three working days of the assessment or the period covered by the supporting documentation.

By sitting or submitting the assessment task the student is declaring that they are fit to do so and cannot later apply for Special Consideration (UNSW 'fit to sit or submit' requirement).

Sitting, accessing or submitting an assessment task on the scheduled assessment date, after applying for special consideration, renders the special consideration application void.

Find more information about special consideration at: <https://www.student.unsw.edu.au/special/consideration/guide>

Or apply for special consideration through your [MyUNSW portal](#).

Late Submission of assessment tasks (other than examinations)

UNSW has a standard late submission penalty of:

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

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

Electronic submission of assessment

Except where the nature of an assessment task precludes its electronic submission, all assessments must be submitted to an electronic repository, approved by UNSW or the Faculty, for archiving and subsequent marking and analysis.

Release of final mark

All marks obtained for assessment items during the session are provisional. The final mark as published by the university following the assessment review group meeting is the only official mark.