

# CVEN9640

Coastal Engineering

Term 1, 2023



## Course Overview

### Staff Contact Details

#### Convenors

Name	Email	Availability	Location	Phone
Ian Turner	<a href="mailto:ian.turner@unsw.edu.au">ian.turner@unsw.edu.au</a>	email	UNSW Water Research Laboratory, Manly Vale	

#### Lecturers

Name	Email	Availability	Location	Phone
Ian Turner	<a href="mailto:ian.turner@unsw.edu.au">ian.turner@unsw.edu.au</a>	email	UNSW Water Research Laboratory, Manly Vale	

### School Contact Information

[Engineering Student Support Services](#) – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

[Engineering Industrial Training](#) – Industrial training questions

[UNSW Study Abroad](#) – study abroad student enquiries (for inbound students)

[UNSW Exchange](#) – student exchange enquiries (for inbound students)

[UNSW Future Students](#) – potential student enquiries e.g. admissions, fees, programs, credit transfer

#### Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

## Course Details

### Units of Credit 6

### Summary of the Course

Waves in coastal waters including theory, measurement, analysis, forecasting, growth, refraction, diffraction, shoaling and breaking processes; coastal and beach processes including tides, storms, currents, elevated water levels, morphology, sediment transport mechanisms, beach erosion and nourishment, longshore transport, prediction and modelling of shoreline change; wave forces on coastal and ocean structures with application to engineering design of breakwaters and seawalls.

### Course Aims

This course aims to develop an appreciation of theory of periodic waves in coastal waters, wave growth, refraction, diffraction, shoaling and breaking processes, and to introduce aspects of the measurement, analysis and prediction of waves. Coastal and beach processes are introduced, including tides, storms, currents and elevated water levels, beach morphology, coastal hazards and onshore/alongshore sediment transport. The course will also provide students with hands-on use of cross-shore sediment transport modelling and the practical engineering design of breakwaters.

### Course Learning Outcomes

After successfully completing this course, you should be able to:

Learning Outcome	EA Stage 1 Competencies
1. Be familiar with the coastal engineering approach to wave measurement, analysis, growth and propagation from deep to shallow water;	PE1.1, PE1.2, PE1.3, PE2.1
2. Have gained an understanding of beach morphology, coastal hazards and sediment onshore/offshore transport; and	PE1.6, PE1.4, PE3.1
3. Developed competence in applying standard coastal engineering approach to calculating wave and current forces on coastal and ocean structures with particular attention to practical performance of breakwaters and seawalls.	PE1.1, PE1.3, PE2.1, PE3.2, PE3.4

### Teaching Strategies

#### Private Study

- Review lecture material and recommended texts
- Practice solutions to example problems

#### Weekly Seminars/Workshops

- Find out what you must learn

- See methods that are not in the lecture materials
- Follow worked examples
- Hear announcements on course changes

#### Practical Exercises

- Practice solving set problems

#### Assessments

- Demonstrate your knowledge and skills
- Demonstrate higher understanding and problem solving

#### Field trip (if based in Sydney)

- Sites inspection, to set studies in context

### **Additional Course Information**

***Please note that all seminar and workshop materials for this course are distributed electronically via Moodle.***



## Assessment

The first three assessments provide the opportunity for students to develop and demonstrate their understanding of the 3 main themes of this course: waves, sediment transport and coastal structures.

The fourth and final assessment enables students to demonstrate their gained knowledge and practical use of the materials covered in the course.

*Students who perform poorly in the practical exercises & assignments are recommended to discuss progress with the Lecturer during the Term.*

Applying for special consideration: <https://student.unsw.edu.au/special-consideration>

**Note:** The Coordinator and/or Lecturer reserves the right to adjust the final scores by scaling if agreed to by the Head of School.

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Wave Theory	15%	Week 3	1, 2, 3
2. Sediment Transport	30%	Week 6	1, 2, 3
3. Breakwater Design	30%	Week 9	1, 2, 3
4. Practical Solutions to Coastal Engineering Problems	25%	Week 10	1, 2, 3

### Assessment 1: Wave Theory

**Assessment length:** 2-hour online quiz

**Submission notes:** Moodle quiz

**Due date:** Week 3

This assessment is designed to capture how well the student understands the course material to the use and appropriate application of linear and other wave theories. Marks are given for correct answers and summed up to form an assignment grade. Specific marking criteria are provided.

#### Additional details

*Online quiz in week 3. Available for 24 hrs; one attempt permitted, and once commenced a maximum of 2 hours to complete.*

*Further details to be provided in Moodle and in weekly seminars/workshops.*

### Assessment 2: Sediment Transport

**Assessment length:** PDF Report. Refer to Moodle for further length and formatting details.

**Submission notes:** Due Week 6 – refer assignment sheet that is available in Moodle for further details.

**Due date:** Week 6

This assessment is designed to capture how well the student understands the course material relating to sediment transport processes. Marks are given for correct answers and summed up to form an assignment grade. Specific marking criteria are provided with the assignment.

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

### **Assessment 3: Breakwater Design**

**Assessment length:** PDF Report. Refer to Moodle for further length and formatting details.

**Submission notes:** Due Week 9 – refer assignment sheet that is available in Moodle for further details.

**Due date:** Week 9

This assignment is designed to capture how well the student understands the course material relating to design of coastal breakwater and revetment structures. Marks are given for correct answers and summed up to form an assignment grade. Specific marking criteria are provided with the assignment.

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

### **Assessment 4: Practical Solutions to Coastal Engineering Problems**

**Assessment length:** 2 hours (incl. time to scan and upload pdf of solutions)

**Submission notes:** This timed, online assessment will be scheduled at the regular class time in Week 10, requiring students to scan & upload their hand-written solutions

**Due date:** Week 10

This timed assessment is open-book. It is designed to capture the student's knowledge of the breadth of materials covered in the course and the ability to apply this knowledge to solve a range of practical coastal engineering problems. The marks for each individual question are indicated.

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

## Attendance Requirements

For courses with Workshops and/or Labs, attendance for those classes is a necessary part of the course. You must **attend at least 80% of the workshop/lab** in which you are enrolled for the duration of the session.

## Course Schedule

[View class timetable](#)

### Timetable

Date	Type	Content
Week 1: 13 February - 17 February		Topic: Waves I
Week 2: 20 February - 24 February		Topic: Waves II
Week 3: 27 February - 3 March		Topic: Beaches, Hazards, Climate Change Assessment due: ASSESSMENT #1 (Online Quiz)
Week 4: 6 March - 10 March		Topic: Sediment Transport I
Week 5: 13 March - 17 March		Topic: Sediment Transport II
Week 6: 20 March - 24 March		<b>NO CLASSES THIS WEEK</b> Assessment due: ASSESSMENT #2 (pdf Report - Turnitin)
Week 7: 27 March - 31 March		Topic: Breakwaters and Revetments I
Week 8: 3 April - 7 April		<b>COASTAL ENGINEERING SITE INSPECTIONS</b> (off campus)
Week 9: 10 April - 14 April		Topic: Beach Nourishment Assessment due: ASSESSMENT #3 (pdf Report - Turnitin)
Week 10: 17 April - 21 April		Assessment scheduled at the regular class time: ASSESSMENT #4 (2-hour, open-book, online submission via Moodle of handwritten solutions)

## Resources

### Prescribed Resources

Specific course resources and references will be provided during the Term.

### Recommended Resources

The following texts are recommended as generally useful:

- *Shore Protection Manual*, 2 volumes, US Army Coastal Engineering Research Center, 4th Edition, 1984.
- Coastal Engineering Manual (CEM) – down load individual chapters for free at (use the search term: 'coastal'):  
<http://www.publications.usace.army.mil/USACE-Publications/Engineer-Manuals/>

### Course Evaluation and Development

Course evaluation will be sought from all students through *myExperience*. This is used to continually improve the outcomes and experience for students.

### Laboratory Workshop Information

This seminar/workshop course will be delivered live and in the classroom each week. For students enrolled in the online mode of course delivery, participation in the live classroom is provided via Teams and weekly recordings will be made available via Moodle. All students are encouraged to use the online Discussion Forum to ask questions and exchange information and ideas.

## **Submission of Assessment Tasks**

Please refer to the Moodle page of the course for further guidance on assessment submission.

**UNSW has a standard late submission penalty of:**

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

## Academic Honesty and Plagiarism

Beware! An assignment that includes plagiarised material will receive a 0% Fail, and students who plagiarise may fail the course. Students who plagiarise are also liable to disciplinary action, including exclusion from enrolment.

Plagiarism is the use of another person's work or ideas as if they were your own. When it is necessary or desirable to use other people's material you should adequately acknowledge whose words or ideas they are and where you found them (giving the complete reference details, including page number(s)). The Learning Centre provides further information on what constitutes Plagiarism at:

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



## Academic Information

### Final Examinations:

Final Exams in T1 2023 will be held on campus between the 28th of April and the 11th of May, and Supplementary Exams between the 22nd of May and the 26th of May. You are required to be available on these dates. Please do not make any personal or travel arrangements during this period.

### ACADEMIC ADVICE

- Key Staff to Contact for Academic Advice (log in with your zID and password): <https://intranet.civeng.unsw.edu.au/key-staff-to-contact-during-your-studies-at-unsw>
- [Key UNSW Dates](#) - eg. Census Date, exam dates, last day to drop a course without academic/financial liability etc.
- CVEN Student Intranet (log in with your zID and password): <https://intranet.civeng.unsw.edu.au/student-intranet>
- Student Life at CVEN, including Student Societies: <https://www.unsw.edu.au/engineering/civil-and-environmental-engineering/student-life>
- Special Consideration: <https://student.unsw.edu.au/special-consideration>
- General and Program-Specific Questions: [The Nucleus: Student Hub](#)
- Book an Academic Advising session: <https://unswengacademicadvising.as.me/schedule.php>

## Disclaimer

*This course outline sets out description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle should be consulted for the up to date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline (as updated in Moodle), the description in the Course Outline/Moodle applies.*

## Image Credit

Photo Credit: Ian Turner

## CRICOS

CRICOS Provider Code: 00098G

## Acknowledgement of Country

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.

## Appendix: Engineers Australia (EA) Professional Engineer Competency Standard

Program Intended Learning Outcomes	
Knowledge and skill base	
PE1.1 Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline	✓
PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline	✓
PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline	✓
PE1.4 Discernment of knowledge development and research directions within the engineering discipline	✓
PE1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline	
PE1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline	✓
Engineering application ability	
PE2.1 Application of established engineering methods to complex engineering problem solving	✓
PE2.2 Fluent application of engineering techniques, tools and resources	
PE2.3 Application of systematic engineering synthesis and design processes	
PE2.4 Application of systematic approaches to the conduct and management of engineering projects	
Professional and personal attributes	
PE3.1 Ethical conduct and professional accountability	✓
PE3.2 Effective oral and written communication in professional and lay domains	✓
PE3.3 Creative, innovative and pro-active demeanour	
PE3.4 Professional use and management of information	✓
PE3.5 Orderly management of self, and professional conduct	
PE3.6 Effective team membership and team leadership	