



# ENVS811

## Coastal Environmental Science

S2 Day 2016

*Dept of Environmental Sciences*

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convenor

Ian Goodwin

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Level 2 AHH Bui

Lecturer

Shari Gallop

[shari.gallop@mq.edu.au](mailto:shari.gallop@mq.edu.au)

Credit points

4

Prerequisites

Admission to MEnv or PGDipEnv or PGCertEnv or MEnvEd or PGDipEnvEd or PGCertEnvEd or MEnvMgt or PGCertEnvMgt or MEnvStud or PGDipEnvStud or MEnvPlan or PGCertEnvPlan or MEnvSc or MSusDev or PGDipSusDev or PGCertSusDev or MWldMgt or PGDipWldMgt or PGCertWldMgt or MSC in (Biodiversity Conservation or Remote Sensing and GIS) or PGDipSc in (Biodiversity Conservation or Remote Sensing and GIS) or PGCertSc in (Biodiversity Conservation or Remote Sensing and GIS) or MMarScMgt or GradDipEnv or GradCertEnv or GradCertSusDev or GradDipSusDev or MConsBiol or GradDipConsBiol

Corequisites

Co-badged status

Unit description

The course is taught around three modules that integrate coastal geoscience with marine climatology, marine ecology, coastal engineering, coastal planning and management. The focus is on the Australian and Pacific Basin coasts. Module 1 focuses on: global to local scale coastal and estuarine processes, environments and resources; coastal biodiversity; coastal and estuarine hazard definition studies. Module 2 focuses on: large-scale coastal behaviour, future coasts, sea-level rise, wave climate change, detecting and attributing change; soft and hard coastal engineering strategies. Module 3 focuses on: coastal Issues and integrated coastal zone management and planning.

## 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:

- To provide a foundation in Coastal Science theory and practice
  - to understand the context of global coasts
  - to outline the intellectual history and origins of modern approaches to coastal environmental science
  - to develop skills to detect the influence of natural vs anthropogenic causes of coastal processes
  - to outline scientific and management issues associated with natural processes and climate change
- become familiar with a range of social, economic and environmental issues for coastal management and understand the opportunities and limitations of managing or solving these problems
- to understand the range of approaches available to manage coastal issues, including soft and hard engineering, planning and legislative
  - to enable students to formulate coastal management plans and understand where to obtain expert advice on coastal issues and management

## Assessment Tasks

Name	Weighting	Due
<a href="#"><u>Research Task 1</u></a>	25%	Wednesday 7 September, 2016
<a href="#"><u>Research Task 2</u></a>	25%	Wednesday 21 September, 2016
<a href="#"><u>Research Task 3</u></a>	25%	Wednesday 12 October, 2016
<a href="#"><u>Research Task 4</u></a>	25%	Wednesday 26th October, 2016

### Research Task 1

Due: **Wednesday 7 September, 2016**

Weighting: **25%**

Research Task 1 - Coastal and Ocean Data Analysis

Research data via web portals, conduct data analysis and conduct a review of relevant research literature. Prepare a report. (1,500 words). Further instructions will be provided in class.

On successful completion you will be able to:

- • To provide a foundation in Coastal Science theory and practice
- • to understand the context of global coasts
- • to outline the intellectual history and origins of modern approaches to coastal environmental science
- • to develop skills to detect the influence of natural vs anthropogenic causes of coastal processes

## Research Task 2

Due: **Wednesday 21 September, 2016**

Weighting: **25%**

Research Task 2 - Coastal Modelling Applications

Research data via web portals, conduct data analysis, gain experience with a variety of coastal models and conduct a review of relevant research literature. Prepare a report. (1,500 words). Further instructions will be provided in class.

On successful completion you will be able to:

- • To provide a foundation in Coastal Science theory and practice
- • to develop skills to detect the influence of natural vs anthropogenic causes of coastal processes
- • to outline scientific and management issues associated with natural processes and climate change
- become familiar with a range of social, economic and environmental issues for coastal management and understand the opportunities and limitations of managing or solving these problems
- • to understand the range of approaches available to manage coastal issues, including soft and hard engineering, planning and legislative
- • to enable students to formulate coastal management plans and understand where to obtain expert advice on coastal issues and management

## Research Task 3

Due: **Wednesday 12 October, 2016**

Weighting: **25%**

Research Task 3 - Coastal Field Science

Conduct field research, prepare field notes in field book, conduct data analysis and conduct a review of relevant research literature. Prepare a report using examples from the field trip. (1,500 words). Further instructions will be provided in class.

On successful completion you will be able to:

- • To provide a foundation in Coastal Science theory and practice
- • to outline scientific and management issues associated with natural processes and climate change
- become familiar with a range of social, economic and environmental issues for coastal management and understand the opportunities and limitations of managing or solving these problems
- • to understand the range of approaches available to manage coastal issues, including soft and hard engineering, planning and legislative
- • to enable students to formulate coastal management plans and understand where to obtain expert advice on coastal issues and management

## Research Task 4

Due: **Wednesday 26th October, 2016**

Weighting: **25%**

Research Task 4 - Coastal Hazards and Coastal Solutions

Research data via web portals, conduct data analysis and conduct a review of relevant research literature. Prepare a report. (1,500 words). Further instructions will be provided in class.

On successful completion you will be able to:

- • To provide a foundation in Coastal Science theory and practice
- • to understand the context of global coasts
- • to outline the intellectual history and origins of modern approaches to coastal environmental science
- • to develop skills to detect the influence of natural vs anthropogenic causes of coastal processes
- • to outline scientific and management issues associated with natural processes and climate change
- become familiar with a range of social, economic and environmental issues for coastal management and understand the opportunities and limitations of managing or solving these problems
- • to understand the range of approaches available to manage coastal issues, including soft and hard engineering, planning and legislative
- • to enable students to formulate coastal management plans and understand where to obtain expert advice on coastal issues and management

## Delivery and Resources

### Classes:

Wednesday 10.00am-16.00 pm (6 hours with lunch break)

Room: EMC-G240 Faculty PC Lab

### Technology used and required

ENV5811 makes extensive use of iLearn for posting readings, slides and additional material that will be useful for assignments. Marks and feedback will also be delivered via iLearn. Turnitin will be used for submitting assignments. Access to the Internet and regular access to the unit's iLearn website is essential in ENV5811.

### Workload expectation:

It is generally expected that students will commit at least 3 hours per week per credit point in their studies. Thus, in addition to attending weekly classes for three hours, students in ENV5811 are expected to complete appropriate reading, research and other activities equivalent to at least 9 hours per week. Thus the total workload for this unit should be considered as a minimum of 12 hours per week throughout the semester. If you are unable to make this commitment to your study, then you should reconsider your decision to enrol – or reassess your priorities. For many students in the class, this unit is a core element of your studies and you should be aiming to secure as high a grade as possible. If you consider you face impediments in committing to this unit, please discuss your situation with Ian Goodwin.

### Pre-requisites and co-requisites

There is no pre-requisite for entry into ENV5811, although entry into an approved program of study is assumed to be a motivation to learn in this area.

### Unit content and expectations

The unit entails:

7 one day face to face lecture/field sessions

7 practical and workshop sessions, including a 1 day field trip

4 Research Task Reports that form the assessment, and satisfactory completion of the other 3 practical or workshop sessions

In order to maximise learning outcomes, students are expected to:

**Attend at least 80% of classes.**

Participate in class workshops and practical group exercises

Read essential readings

Complete all assessment tasks

## READINGS

There is a minimum reading requirement (essential reading) in this unit. Essential reading requirements will be provided week by week. You are also expected to read from the list below as a start for completing the assignments, as well as drawing on literature that you find from your own research **especially journal articles**.

### *General Reading List*

## **Books**

### **Major references**

These books contain specialist information on segments of the course. Use these references with the recommended textbook and scientific papers to consolidate material provided in lectures.

The following books are available online or are on reserve under the course GSE811:

Bird, C.F. 1996. *Beach Management*. Wiley, New York, 281pp.

Call Number: TC330 .B57/1996

Carter, R.W.G. & Woodroffe, C.D. 1994. *Coastal Evolution. Late Quaternary shoreline morphodynamics*. Cambridge University Press.

Call Number: QE501.4.P3 .C63

Charlier, R.H., DeMeyer, C.P. 1998. *Coastal Erosion: Response and Management*. Springer, Berlin, 343pp.

Call number: TC330 .C43/1998

Department of Climate Change, Australian Government 2009. *Climate change risks to Australia's coast*. 168p. [www.climatechange.gov.au/publications/coastline/climate-change-risks-to-australias-coasts.aspx](http://www.climatechange.gov.au/publications/coastline/climate-change-risks-to-australias-coasts.aspx)

French, P.W. 2001. *Coastal Defences: Processes, Problems and Solutions*. Routledge, New

York, 366pp.

Call number: TC330 .F74 2001

Harvey, N. and Caton, B. 2010. *Coastal Management in Australia*. University of Adelaide Press, Adelaide, 342pp.

PDF available free online from University of Adelaide Press: <http://www.adelaide.edu.au/press/titles/coastal/>

Hotta, K., Dutton, I.M. 1995. *Coastal Management in the Asia-Pacific Region : Issues and Approaches*. Japan International Marine Science and Technology Federation, Tokyo.

Call Number: HC441 .C635/1995

Norton, T., Lefroy, T., Bailey, K., Unwin, G. 2008. *Biodiversity: Integrating Conservation and Production. Case Studies from Australian Farms, Forests and Fisheries*. CSIRO Publishing, Collingwood, p.272.

Call number: QH77.A8 B558 2008

NSW Government. 1990 and 2007. *Coastline Management Manual*. NSW Government Publisher. Available at: [www.environment.gov.au/marine/manuals\\_reports/coast\\_manual/index.html](http://www.environment.gov.au/marine/manuals_reports/coast_manual/index.html)

Silvester, R. & Hsu, J.R.C. 1997. *Coastal Stabilization*. World Scientific Publishing. 578 pages.

Call number: TC209 .S54/1997

Short, A.D. 1999. *Handbook of Beach and Shoreface Morphodynamics*. John Wiley and Sons, Chichester, UK. Call number: GB454.B3 .H35/1999

Steffen, W. 2009 *Australia's biodiversity and climate change*. CSIRO Publishing, Collingwood, 236pp.

Call number: QH541.15.B56 A97 2009

Turner, L., Tracey, D., Tilden, J., Dennison, W. 2006. *Where River Meets Sea Exploring Australia's Estuaries*. CSIRO Publishing, Collingwood, 278pp.

Call number: QH541.5.E8 W53 2004



Underwood, A.J., Chapman, M.G. 1994. *Coastal Marine Ecology of Temperate Australia*. New South Wales University Press, Kensington, 341pp.

Call number: QH541.5.S3 C57 1994

Valiela, I. 2006. *Global Coastal Change*. Blackwell Publishing, Malden, MA, USA, 368 pp.

Call number: GB451.2 .V35 2006

Viles, H. and Spencer, T. 1995. *Coastal Problems: Geomorphology, Ecology and Society at the Coast*. Arnold, London, U.K., 350 pp.

Woodroffe, C.D. 2003. *Coasts: Form, Process and Evolution*. Cambridge University Press, Cambridge, U.K.

Call number: GB451.2 .W65 2003

Wright, J., Colling, A. & Park, D. 1999. *Waves, Tides and Shallow-Water Processes*. Butterworth Heinemann and Open University, Oxford and Milton Keynes, 228 pages.

Call number: GC211.2 .W38/1989

## **Journals**

The following journals publish articles relevant to Coastal Management. Specific articles relevant to each lecture topic will be provided in class and additional reading can also be done through keyword searches in ISI Web of Knowledge through Macquarie University's library database website.

### **Annual Review of Environment and Resources**

Provides authoritative reviews of significant topics within environmental science and engineering, including ecology and conservation science, water and energy resources, atmosphere, oceans, climate change, agriculture and living resources, and human dimensions of resource use and global change.

### **Biological Conservation**

Publishes articles spanning a diverse range of fields that contribute to the biological, sociological, and economic dimensions of conservation and natural resource management. Publishes papers

that advance the science and practice of conservation, or which demonstrate the application of conservation principles for natural resource management and policy.

### Coastal Management

An applied research journal dedicated to exploring the technical, applied ecological, legal, political, social, and policy issues relating to the use of coastal and ocean resources and environments on a global scale. The journal presents timely information on management tools and techniques as well as recent findings from research and analysis that bear directly on management and policy.

### Coastal Engineering

*Combining practical application with modern technological and scientific achievements, it publishes fundamental studies as well as case histories on the following aspects of coastal, harbour and offshore engineering: studies on waves and currents; coastal morphology; estuary hydraulics; harbour and offshore structures.*

### Conservation Biology

The journal publishes groundbreaking papers and is instrumental in defining the key issues contributing to the science and practice of conserving Earth's biological diversity.

### Ecological Applications

Open to research and discussion papers that integrate ecological science and concepts with their application and implications. Of special interest are papers that develop the basic scientific principles on which environmental decision-making should rest, and those that discuss the application of ecological concepts to environmental problem solving, policy, and management.

### Estuaries and Coasts

It publishes original research on the hydrodynamics, hydrology, (geo)chemistry, geology, biology and their interactions in marine waters influenced by connectivity to land. The journal's geographic scope includes coastal watersheds, tidal rivers, estuaries, lagoons, inland seas, wetlands, and near-shore coastal waters from polar to equatorial latitudes.

### Estuarine, Coastal and Shelf Science

*The journal is an international multidisciplinary journal devoted to the analysis of saline water phenomena ranging from the outer edge of the continental shelf to the upper limits of the tidal zone. The journal provides a unique forum, unifying the multidisciplinary approaches to the study*

of the oceanography of estuaries, coastal zones, and continental shelf seas.

#### *Frontiers in Ecology and the Environment*

*The journal focuses on current ecological issues and environmental challenges and is designed to appeal to readers from all aspects of ecology, environmental science, and related disciplines.*

#### *Global Environmental Change: Human and Policy Dimensions*

*The journal interprets global environmental change to mean the outcome of processes that are manifest in localities, but with consequences at multiple spatial, temporal and socio-political scales. It addresses issues of public policy, economics, equity, risk, and resilience, science policy, international development, and health and well-being.*

#### Journal of Coastal Research

By covering the entire field of coastal research, the journal encompasses all subjects relevant to natural and engineered environments (freshwater, brackish, or marine) and the protection/management of their resources in the vicinity of coastlines of the world.

#### Journal of Coastal Conservation

The Journal of Coastal Conservation is a scientific journal for the dissemination of both theoretical and applied research on integrated and sustainable management of the terrestrial, coastal and marine environmental interface.

#### *Journal of Environmental Management*

*The journal publishes original research for all aspects of management and the managed use of the environment, both natural and man-made.*

#### Landscape and Urban Planning

A journal aimed at advancing conceptual, scientific, and applied understandings of landscape in order to promote sustainable solutions for landscape change.

#### Marine Geology

This international journal reports on developments in the fields of marine geology, geochemistry and geophysics.

### Marine Pollution Bulletin

*The journal* is concerned with the rational use of maritime and marine resources in estuaries, the seas and oceans, as well as with documenting marine pollution and introducing new forms of measurement and analysis. A wide range of topics are discussed as news, comment, reviews and research reports, not only on effluent disposal and pollution control, but also on the management, economic aspects and protection of the marine environment in general.

### Ocean and Coastal Management

*The journal* is dedicated to the study of all aspects of ocean and coastal management at international, national, regional, and local levels. The different disciplines may range from the natural and physical sciences to the social sciences, policy analysis, economics, and law.

### Ocean Dynamics

Publishes in the following areas of research: theoretical oceanography; computational oceanography; observational oceanography (including all aspects of monitoring the state of the ocean); and articles with an interdisciplinary character that encompass research in the fields of biological, chemical and physical oceanography.

### Ocean Science Journal

Aims to achieve the advancement and dissemination of information in the field of oceanography. Publishes on all fields of oceanography including physical oceanography, biological oceanography/marine biology, chemical oceanography/marine chemistry, geological oceanography/marine geology, and marine pollution.

### Shore and Beach

The journal strives to publish high-quality papers that contribute to the knowledge base necessary for sound coastal decision-making and the important contemporary debates concerning shores and beaches everywhere. Content includes coastal scientific, economic, social, and political findings, coastal observations, and editorials.

## ASSESSMENT TASKS

Assessment of your performance in GSE811 is based on four research task assignments that will be based on the in-class practical and workshop topics, together with your own research and report writing. You will be provided with written instructions for each assignment in class. **All assignments must be completed and receive a minimum of a pass to receive a passing grade in ENV5811.**

### Submitting your assignments:

Research Task assignments 1,2, 3, and 4 must be submitted on (or before) 9.00am on the due date listed.

Assignments must be submitted using [www.turnitin.com](http://www.turnitin.com). When you are submitting via turnitin you don't have to sign the declaration or include the cover sheet at this stage. **All students must put their name and student number in the document somewhere else (e.g. first page, footer/header) so it can be identified when printed out.**

**All students** must keep a clean electronic copy of their assignment.

**Late penalties:**

Please note that the penalty for late submission of assignments is 10% per day or part thereof, calculated from 9:00am on the due date listed. Extensions must be requested in writing at least 1 week before due date (in normal circumstances) to Ian Goodwin. Please talk to (or email) Ian about any circumstances that affect your assignments before the due date.

**CHANGES MADE IN THIS UNIT FROM 2015**

The course content has been revised since 2015.

## Unit Schedule

### ENV5811 Diary 2016

Week	Lecture Date	Lecturer	Lecture Topic	Practical / Workshop Topic	Assessment	Assessment Due Dates
1	Wed 3th August		No Lectures	No practical		
2	Wed 10 <sup>th</sup> Aug		No Lectures	No practical		
3	Wed 17 <sup>th</sup> Aug		No Lectures	No practical		
4	Wed 24 <sup>th</sup> Aug	A/Prof Ian Goodwin	1. Global Context for Coastal Change	Group Workshop 1 - Sandy, Muddy and Carbonate Coasts	Satisfactory Completion	
5	Wed 31 <sup>st</sup> Aug	A/Prof Ian Goodwin	2. Climate Change and Coastal Oceans - Sea-Level Rise, Wave Climate and Ocean Wind Changes	Research Task 1 - Coastal and Ocean Data Analysis	Report Assessable (IG mark) 25%	

6	Wed 7 <sup>th</sup> Sept	Dr Shari Gallop	3. Coastal and Estuarine Processes	Group Workshop 2 - Contrasting Australian Estuaries	Satisfactory Completion	Research Report 1
7	Wed 14 <sup>th</sup> Sept	Dr Shari Gallop	4. Alterations to Sediment Transport and Freshwater Discharge	Research Task 2 - Introduction to Coastal Modelling	Report Assessable (SG Mark) 25%	
Mid-semester break – two weeks						Research Report 2
8	Wed 5 <sup>th</sup> Oct	Dr Shari Gallop/A/ Prof Ian Goodwin	5. Coastal Process and Coastal Evolution Field Trip	Research Task 3 – Coastal Field Science	Field Trip Report (SG Mark) 25%	
9	Wed 12 <sup>th</sup> Oct	Dr Shari Gallop	6. Coastal Pollution	Group Workshop 3 - Oil Spill Response and Impacts	Satisfactory Completion	Research Report 3
10	Wed 19 <sup>th</sup> Oct	A/Prof Ian Goodwin	7. Coastal Hazards, Risk Assessment and Coastal Protection	Research Task 4 - Coastal Hazards and Coastal Solutions	Report Assessable (IG mark) 25 %	
11	Wed 26 <sup>th</sup> Oct		No Lectures	No practical		Research Report 4
12	Wednesday 2 <sup>nd</sup> Nov		No lectures	No practical		
13			No lectures	No practical		

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

**New Assessment Policy in effect from Session 2 2016** [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of 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/support/student\\_conduct/](https://students.mq.edu.au/support/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](http://ask.mq.edu.au).

### IF YOU ARE HAVING TROUBLE IN THIS UNIT:

If you are having trouble with any aspect of GSE811, you should discuss the matter with Ian Goodwin, the Unit Convener. If you require extensions for assignments, please do not leave it to the last moment, and please recognise that you need to provide appropriate documentation. The University provides excellent health and counselling services on-campus and also significant disability support if required.

The Faculty and the University have important policies on student behaviour, computer usage, plagiarism and other forms of cheating. Your conduct in GSE811 should always be respectful of your fellow students and others involved in the unit, and the people and other species that your work affects, and should always be consistent with policies of the Faculty and the University.

## Student Support

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

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to 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](http://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/](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

### PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

### Learning outcomes

- To provide a foundation in Coastal Science theory and practice
- to outline the intellectual history and origins of modern approaches to coastal environmental science
- to develop skills to detect the influence of natural vs anthropogenic causes of coastal processes
- to outline scientific and management issues associated with natural processes and climate change
- become familiar with a range of social, economic and environmental issues for coastal management and understand the opportunities and limitations of managing or solving these problems
- to understand the range of approaches available to manage coastal issues, including soft and hard engineering, planning and legislative

### Assessment tasks

- Research Task 3



- Research Task 4

## PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

### Learning outcomes

- • To provide a foundation in Coastal Science theory and practice
- • to understand the context of global coasts
- • to outline the intellectual history and origins of modern approaches to coastal environmental science
- • to develop skills to detect the influence of natural vs anthropogenic causes of coastal processes
- • to outline scientific and management issues associated with natural processes and climate change
- • to understand the range of approaches available to manage coastal issues, including soft and hard engineering, planning and legislative

### Assessment tasks

- Research Task 1
- Research Task 2
- Research Task 3
- Research Task 4

## PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

### Learning outcomes

- • To provide a foundation in Coastal Science theory and practice
- • to understand the context of global coasts
- • to outline the intellectual history and origins of modern approaches to coastal environmental science

- • to develop skills to detect the influence of natural vs anthropogenic causes of coastal processes
- • to outline scientific and management issues associated with natural processes and climate change
- become familiar with a range of social, economic and environmental issues for coastal management and understand the opportunities and limitations of managing or solving these problems
- • to understand the range of approaches available to manage coastal issues, including soft and hard engineering, planning and legislative

## **Assessment tasks**

- Research Task 1
- Research Task 2
- Research Task 3

## **PG - Research and Problem Solving Capability**

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

## **Learning outcomes**

- • To provide a foundation in Coastal Science theory and practice
- • to understand the context of global coasts
- • to develop skills to detect the influence of natural vs anthropogenic causes of coastal processes
- • to outline scientific and management issues associated with natural processes and climate change
- become familiar with a range of social, economic and environmental issues for coastal management and understand the opportunities and limitations of managing or solving these problems
- • to understand the range of approaches available to manage coastal issues, including soft and hard engineering, planning and legislative

## **Assessment tasks**

- Research Task 1
- Research Task 2

- Research Task 3
- Research Task 4

## PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

### Learning outcomes

- • To provide a foundation in Coastal Science theory and practice
- • to develop skills to detect the influence of natural vs anthropogenic causes of coastal processes
- • to outline scientific and management issues associated with natural processes and climate change
- become familiar with a range of social, economic and environmental issues for coastal management and understand the opportunities and limitations of managing or solving these problems
- • to understand the range of approaches available to manage coastal issues, including soft and hard engineering, planning and legislative

### Assessment tasks

- Research Task 1
- Research Task 2
- Research Task 3
- Research Task 4

## PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

### Learning outcomes

- • to outline scientific and management issues associated with natural processes and climate change

- become familiar with a range of social, economic and environmental issues for coastal management and understand the opportunities and limitations of managing or solving these problems
- • to understand the range of approaches available to manage coastal issues, including soft and hard engineering, planning and legislative