



University of Sydney Institute of Marine Science

2010 MARINE SCIENCE POSTGRADUATE COURSEWORK

MARINE SCIENCE UNITS OF STUDY & DESCRIPTIONS

Masters of Applied Science (Environmental Science) (MAppSc(EnviSci))

Unit of Study	
Unless otherwise indicated, all units are worth 6 credit points	
NTMP5005*	Tropical Coastal Management
MARS5006	Coral Reefs, Science & Management
GEOG5001	Geographic Information Science A
GEOG5002	Geographic Information Science B
ENVI5708	Introduction to Environmental Chemistry
ENVI5809	Environmental Simulation Modelling
ENVI5803	Law & the Environment
ENVI5903	Sustainable Development
ENVI5905	Management of Parks
ENVI5904	Understanding Environmental Uncertainty
ENVI5705	Ecological Principles for Environmental Scientists
ENVI5707	Energy Sources, Uses & Alternatives
ENVI5801	Social Science of Environment
ENVI5805	The Urban Environment & Planning
ENVI5808	Appl. Ecology for Environmental Scientists
ENGG5601	Greenhouse Gas Mitigation
GEOG5004	Environmental Mapping & Monitoring
GEO5501	Human Rights & the Environment
FOR MASTERS STUDENTS ONLY	
ENVI5501	Environmental Research Project (12cp)
RESP5001	Fundamentals of Research

Not offered in 2010:

*NTMP5005 - Tropical Coastal Management

MARINE SCIENCE POSTGRADUATE COURSEWORK

~ UNITS OF STUDY

NTMP5005 - Tropical Coastal Management (not offered in 2010) **S2**
http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=NTMP5005_Tropical_Coastal_Management_6602

This course examines the impacts of human activities on coastal and marine environments. It explores the complex relationships among the ecological and social values of these environments and outlines strategies and tools for their management. This is an intensive course that will be held at the University of Queensland Moreton Bay Research Station, North Stradbroke Island.

Teacher/Coordinator: Prof. Andy Short (Andy.Short@usyd.edu.au)

Credit points: 6

Session: Semester 2

Classes: Fieldschool 80 hours intensive.

Corequisites: MARS5002 and MARS5003

Prohibitions: NTMP3005

Assessment: Presentation, teamwork, assignment, 1 hr exam

Textbooks: Handouts provided.

Note: Department permission required for enrolment. Note: department permission required for enrolment

MARS5006 - Coral Reefs, Science and Management **S1**
http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=MARS5006_Coral_Reefs_Science_and_Management_5456

This unit provides an in-depth overview of the key biological and non-biological processes that make up coral reef ecosystems. There is a focus on the biogeographic, oceanographic and physiological processes underlying the integrity of global tropical reef systems. The Great Barrier Reef is used as a case study to explore emerging concepts on the influence of natural and anthropogenic processes on the integrity of global reef and lagoon systems. Learning activities will include a series of background lectures and research seminars and tutorials in the development of a major research project. A major aspect of this unit is an independent research project conducted under the supervision of the course instructors. The unit concludes with a series of oral presentations based on student research. Assessment tasks will consist of two essays and a research project report and presentation. The curriculum in this unit is based on current research and a course book will be provided. This is a field intensive course held at One Tree Island Research Station. The course is ex-Gladstone Queensland and students are expected to make their own way there. This unit will be run over 8 days and there will be an additional course fee for food and accommodation, expected to be \$600.

Teacher/Coordinator: Prof. Maria Byrne (m.byrne@anatomy.usyd.edu.au)

Credit points: 6

Session: Semester 1

Classes: University base delivery: Prefield trip Tutorial (1 hr), On-line exercises (2 hr) Field based delivery: Lectures (11 x 1 hr), Seminars (4 x 1 hr), Tutorials - individual consultations to develop concepts in research (2 x 1 hr), Independent Research an

Assessment: Written assignments: essay and project report; oral presentations; seminar and lecture participation.

Note: Department permission required for enrolment.

GEOG5001 - Geographic Information Science A

S1/S2

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=GEOG5001_Geographic_Information_Science_A_3825

This unit of study gives an overview of basic spatial data models, and enables students to understand the import and export of data to and from a geographical information system (GIS). The manipulation of spatial data at a level appropriate to planning or locational applications, and the development of thematic maps from diverse data layers, will be addressed.

Teacher/Coordinator: Dr David Chapman (dmc@mail.usyd.edu.au)

Credit points:6

Session: Semester 1, Semester 2

Classes: Six workshops.

Assessment: Report

GEOG5002 - Geographic Information Science B

S2

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=GEOG5002_Geographic_Information_Science_B_3826

This course will provide the conceptual background to more advanced GIS analysis applications and spatial reasoning methods in the context of contemporary environmental issues. The course is designed to provide an understanding of spatial analysis techniques available within a GIS environment, explore a diversity of both social and physical environmental applications and address emerging issues in GIS research. A range of topics will be introduced including field based capture of spatial information, spatial data structures, surface modelling, visibility analysis, hydrological modeling, network analysis, spatial data uncertainty and social GIS. Conceptual material presented in lectures and tutorial workshops will be placed in an applied context through a series of laboratory and field sessions designed to strengthen practical understanding and awareness of GIS methods.

Teacher/Coordinator: Dr Eleanor Bruce (e.bruce@usyd.edu.au)

Credit points: 6

Session: Semester 2

Classes: One 2 hour lectures, one 1 hour tutorial, one 3 hour practical per week for 6 weeks.

Assumed knowledge: GEOG5001

Assessment: 2500 word assignment, seminar presentation, tutorial reports, WebCT quiz.

ENVI5708 - Introduction to Environmental Chemistry

S1

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5708 Introduction to Environmental Chemistry 3473

Introduction to Environmental Chemistry provides the basic chemical knowledge required to be able to understand chemical analysis of air, water and soil samples taken in the field. This is supplemented by a field-based project analysing soil and sediment samples for trace pollutants from locations in and around Sydney. This unit of study involves 4 contact hours per week for one semester as well as some time in the field as arranged with the class.

Teacher/Coordinator: A/Prof Gavin Birch (g.birch@usyd.edu.au)

Credit points: 6

Session: Semester 1

Classes: Two 1 hour lectures and one practical per week; one field trip per semester.

Assessment: Assignment, presentation and report

Note: This is a compulsory course for the Grad Dip and Masters levels of the Applied Science (Environmental Science) program.

ENVI5809 - Environmental Simulation Modelling

S1

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5809 Computer Modelling Resource Management 3479

The concept and use of computer modelling in natural resource management is introduced in this unit of study, which is aimed particularly at non-programmers.

Teacher/Coordinator: Dr David Chapman (dmc@mail.usyd.edu.au)

Credit points: 6

Session: Semester 1

Classes: Six workshops.

Assessment: Report

ENVI5803 - Law and the Environment

S1

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5803 Law and the Environment 3476

This unit of study provides an overview of Australian and international law as it pertains to the environment. It looks at a number of environmental issues at the various levels of analysis, policy making, implementation of policy and dispute resolution. It also provides a broad background to political and economic issues as they related to the legal issues. This unit of study involves lecture material and an essay on policy issues.

Teacher/Coordinator: Dr Gerry Bates (g.bates@usyd.edu.au)

Credit points: 6

Session: Semester 1

Classes: One 2 hour lectures per week.

Assessment: Essays

ENVI5903 - Sustainable Development

S2

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5903_Sustainable_Development_3480

This unit of study demonstrates the history and contested understandings of the concept of sustainable development. It applies these concepts to explore important environmental science issues such as population, water management sustainable cities, rural development, industrial ecology, and energy issues. The unit concludes by presenting a range of future scenarios and encouraging students to develop their own vision of sustainability at the global and other scales, and to communicate their means of achieving this sustainability vision.

Teacher/Coordinator: Dr Phil McManus (p.mcmanus@usyd.edu.au)

Credit points: 6

Session: Semester 2

Classes: Two 2 hour lectures per week for seven weeks.

Assessment: Essay and presentation

ENVI5905 - Management of Parks

S2

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5905_Management_of_Parks_3482

This unit of study evaluates the reasons for the existence of parks, including National Parks, recreational spaces and reserves, and examines the applied aspects of their management. Topics covered include conservation, ecotourism, plans of management and their implementation (with particular emphasis on the remediation of the impacts of visitor numbers and erosion), fire control practices and resource management. Students will visit various parks within the Sydney region (such as the Royal National Park, the Sydney Harbour Foreshore, Jenolan Caves Reserve and Centennial Park) that highlight the different issues introduced in lectures and which illustrate the practical measures undertaken to manage the parks in a sustainable fashion.

Teacher/Coordinator: A/Prof Deirdre Dragovich (d.dragovich@usyd.edu.au)

Credit points: 6

Session: Semester 2

Classes: Lectures 2hrs for 6 weeks, Practical work 3 hrs for 3 wks, Fieldwork 21 hrs (2.5 days), Total / week 7 hrs average

Assessment: A prac report, assignment, one 1hr exam

Textbooks: A Course Handbook will be provided.

ENVI5904 - Understanding Environmental Uncertainty

S2

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5904 Understanding Environmental Uncertainty 3481

No assessment of potential environmental impacts is possible without relevant information about the ecological consequences. This unit is for those without a science degree, to explain the need to quantify and what are relevant measures. Describing and understanding uncertainty will be explained in the context of precautionary principles. Issues about measuring biodiversity and the spatial and temporal problems of ecological systems will be introduced.

Teacher/Coordinator: Ass/Prof. Ross Coleman (r.coleman@eicc.bio.usyd.edu.au)

Credit points: 6

Session: Semester 2

Classes: One three hour lecture per week for 8 weeks.

Assessment: Tutorials, oral presentations and written reports.

ENVI5705 - Ecological Principles for Environ Scientists

S1

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5705 Ecolog Principles for Environ Scientists 3471

This unit of study introduces fundamental concepts of modern ecology for environmental scientists so as to provide non-biologically trained persons an understanding of the nomenclature of ecology and the physical parameters represented.

Teacher/Coordinator: Dr Charlotte Taylor (cetaylor@bio.usyd.edu.au)

Credit points: 6

Session: Semester 1

Classes: One 3 hour lecture per week.

Assessment: Assignment, presentation.

Note: This is a compulsory course for all levels of the postgraduate Applied Science (Environmental Science) program.

ENVI5707 - Energy - Sources, Uses and Alternatives

S2

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5707 Energy Sources Uses and Alternatives 3472

Environmental impacts of energy generation and use are addressed in this unit of study. Major topics include discussion of the various energy sources, global energy resources, the economics associated with energy production, the politics and culture that surrounds energy use, and the alternative sources of solar thermal and photovoltaic energy and atmospheric systems. This unit of study includes several field trips to energy utilities and industry groups associated with alternate energy sources and generation.

Teacher/Coordinator: Dr Chris Dey (c.dey@physics.usyd.edu.au)

Credit points: 6

Session: Semester 2

Classes: Two 1 hour lectures per week and three field trips per semester.

Assessment: Assignment, presentation and quiz

ENVI5801 - Social Science of Environment

S1

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5801_Social_Science_of_Environment_3474

This unit provides both a conceptual and an empirical foundation for the analysis of relationships between society, the environment and natural resources. Contexts for application of social science concepts to the environment include climate change, water resources management, forest issues and urban environmental quality. Students will deal with both broad theoretical approaches to the societal analysis of relationships between people and the environment, for example political ecology, and with specific themes including the sociological basis of collective action, property relations, resource tenure, decentralisation, participatory approaches to environmental and natural resource management, and systems of knowledge. The unit pays particular attention to the implications of heterogeneous and competing interests for environmental and natural resource management and explores ways of dealing with diverse stakeholder interests. Empirical material is drawn from various countries, with special emphasis on Southeast Asia and Australia. The aim of the unit is to provide conceptual tools that will be used in other units of study within the program and for application in analysis of resource and environmental management issues faced in real world decision-making contexts. The unit will draw on the professional experience and agency roles of participants. The unit is taught through a combination of lectures and reading-based seminars.

Teacher/Coordinator: Dr P McManus (p.mcmanus@usyd.edu.au)

Credit points: 6

Session: Semester 1

Classes: 2hrs lectures and 2 hrs tutorials per week plus directed reading. The unit runs for weeks 1-7

Assessment: essay and seminar presentation

Campus: Camperdown/Darlington

Mode of delivery: Normal (lecture/lab/tutorial) Day

ENVI5805 - The Urban Environment and Planning

S1

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5805_The_Urban_Environment_and_Planning_3477

The aim of this unit of study is to introduce the concepts and procedures which are relevant to the application of scientific analysis to the formulation of urban and regional development policy and strategies.

Teacher/Coordinator: Dr John Dee (jdee@arch.usyd.edu.au)

Credit points: 6

Session: Semester 1

Classes: Eight lectures and eight 2 hour seminars per semester

Assessment: Report and short research paper

Campus: Camperdown/Darlington

Mode of delivery: Normal (lecture/lab/tutorial) Day

ENVI5808 - App Ecology for Environmental Scientists

S2

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5808_App_Ecology_for_Environmental_Scientists_3478

This unit of study complements ENVI5705, and covers in depth the concerns of modern ecology pertaining to both terrestrial and marine ecosystems. An understanding of the complex issues of invasive species, conservation of biodiversity and ecological management of the environment is provided.

Teacher/Coordinator: Dr Clare McArthur (claremc@usyd.edu.au)

Credit points: 6

Session: Semester 2

Classes: Three 1 hour lectures per week.

Assessment: Essays and presentations

Note: This is a compulsory unit for all levels of the postgraduate Applied Science (Environmental Science) program

ENGG5601 - Greenhouse Gas Mitigation

S2

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENGG5601_Greenhouse_Gas_Mitigation_3270

Graduate unit of study designed for environmental engineering students, either M.E.S. or Grad. Cert. of GHG Mitigation

Keywords: Greenhouse science, energy efficiency, carbon sinks, climate change amelioration

Objectives: To develop an understanding of, the significance of carbon dioxide in climate; the role of increasing fossil fuel energy conversion efficiency; the international framework for carbon sinks; the size, cost, potential and nature of terrestrial and oceanic sinks of carbon; the amelioration of the impacts of climate change.

Outcomes: Students will be able to make recommendations of the most cost effective approach to enterprises meeting carbon dioxide limits expected to be imposed as a result of the Kyoto Protocol.

Teacher/Coordinator: A/Professor Ian Jones (I.Jones@civil.usyd.edu.au)

Credit points: 6

Session: Semester 2

Classes: 2 hour lecture and a tutorial each week. Offered every year

Assessment: Assignments and final examination

Campus: Camperdown/Darlington

Mode of delivery: Normal (lecture/lab/tutorial) Day

Textbooks:

- P. Riemer, A. Smith, K. Thambimuthu (1998). Greenhouse Gas Mitigation, Elsevier, Amsterdam. pp777.

Note: Department permission required for enrolment.

Note: Unit Administration: WebCT

GEOG5004 - Environmental Mapping and Monitoring

S2

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=GEOG5004_Environmental_Mapping_and_Monitoring_3828

The unit introduces methods associated with acquiring data in the field and examines issues associated with application of spatial data to environmental monitoring, terrain mapping and geocomputing. Students will learn both theoretically and practically how environmental data is collected using different remote sensing techniques, (pre)processing methods of integrating data in a GIS environment and the role of spatial data in understanding landscape processes and quantifying environmental change.

Teacher/Coordinator: Dr Peter Cowell (cowell@usyd.edu.au)

Credit points: 6

Session: Semester 2

Classes: 2 hours of lectures and one three hour practical per week.

Assessment: Assignments

Campus: Camperdown/Darlington

Mode of delivery: Normal (lecture/lab/tutorial) Day

GEOS5501 - Human Rights and the Environment

S2

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=GEOS5501_Human_Rights_and_the_Environment_3915

This core unit of study addresses the nexus between human rights and the environment. The unit has a geographical focus on Australia and the Asia-Pacific region. Human rights and environmental concerns intersect in diverse and complex ways. Rights to a healthy environment and rights to resources forge a common cause between human rights advocates and environmental activists. Projects such as dams and mines have on-site and wider environmental impacts that displace marginal groups and impact on their rights to livelihood. On the other hand, creation of protected areas and other forms of environmental protection that alienate indigenous and other groups from their customary

land and livelihoods create an uneasy relationship between human rights and environmental movements. Public and private access to urban space is also bound up with rights around race, sexuality and class. There are also human rights issues associated with climate change, the fate of South Pacific islands and environmental refugees. The unit of study deals with the human rights -- environment nexus around such themes through a series of lectures, seminars and case study based assignment work.

Teacher/Coordinator: Dr Robert Fisher (r.fisher@usyd.edu.au)

Credit points: 6

Session: Semester 2

Classes: One 2 hour seminar per week and 4 hours per week personal study

Assessment: 3000 word essay 70%, Seminar paper 30%

Campus: Camperdown/Darlington

Mode of delivery: Normal (lecture/lab/tutorial) Day

ENVI5501 - Environmental Research Project

S1/S2

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=ENVI5501 Environmental Research Project 3470

A valuable opportunity to apply some of the knowledge gained from earlier coursework, ENVI5501 consists of a research project as arranged between you (the student) and an appropriate supervisor. The project topic may contain a field or laboratory component, or may be entirely literature-based. The only requirement is that the topic be of environmental emphasis, meaning that potential topics range from ecotourism to pollution detection and monitoring, erosion to solar power, environmental law to conservation biology. The topic must also be able to be completed within the timeframe of 16 weeks (one semester) of investigation, including the literature survey, sample and data collection, analysis of data and results, and write up of the report. This unit is not conducted by way of a number of contact hours per week for a semester. Instead, the student will work on the project full-time (aside from other study commitments) in a continuous manner for the entire duration (1 semester). Any student interested in taking ENVI5501 should contact the postgraduate advisor for Environmental Science to discuss their project and for help in selecting and appropriate supervisor.

Teacher/Coordinator: Assoc/Prof. Ross Coleman (ross.coleman@bio.usyd.edu.au)

Credit points: 12

Session: Semester 1, Semester 2

Classes: Meetings arranged with supervisor.

Prerequisites: 24 credit points of study with a credit average or better

Assessment: Written report and continuous assessment

Note: This unit of study is available only to students enrolled in AppSc(EnvSc)

RESP5001 - Fundamentals of Research**S1/S2**

http://www.usyd.edu.au/courses/?uos=1&uos_sef_id=RESP5001_General_Research_Methods_8039

Masters students only

This unit will provide research training for students wishing to undertake research at a Masters or PhD level. Students will revise or develop the necessary skills for commencing a research degree, including critical reading, developing the thesis proposal, developing a research plan with timelines and benchmarks, critical writing, library search techniques, use of referencing systems like EndNote, working with a supervisor, and matters relating to intellectual property and authorship.

Teacher/Coordinator: A/Prof D Dragovich (d.dragovich@usyd.edu.au)

Credit points: 6

Session: Semester 1a, Semester 2a

Assessment: Three 1000 word reports, oral presentation

Campus: Camperdown/Darlington

Mode of delivery: Normal (lecture/lab/tutorial) Day