

MAR303 Marine Science Project

General Information

Faculty: Science

Department: Marine Science

Credit Points: 3

Semester: 1, 2 (2010)

Offered: D1, D2; First Half-Year and Second Half-Year

Unit Convenor: Assoc. Prof. David Raftos (draftos@rna.bio.mq.edu.au, 9850 8402, E8C 245)

Prerequisites/Corequisites: MAR201(P) or ELS201(P) and admission to BMarSc

Unit Description

The Marine Science Project is the CAPSTONE unit for the Bachelor of Marine Science. Students will undertake an independent research project under the supervision of one of Macquarie University's marine research staff. The objective of the unit is to expose students to the scientific research process: developing a research proposal, conducting the proposed research, writing a scientific report about the research findings, and communicating the findings as a research seminar.

The scope of past projects has been broad, with students undertaking a range of data collection methods (e.g., laboratory experiments, fieldwork, data synthesis) and producing a range of different research products (e.g., scientific reports, field guides, review articles). Although there are no formal classes, students are expected to commit at least 135 hours to their project during the semester, culminating with the submission of a scientific report.

Students are responsible for contacting a supervisor at or before the beginning of the semester and establishing a project topic (see "Teaching Staff" below). A meeting of all students and participating staff will take place early in the semester to discuss projects and expectations for the unit.

Meeting date for second semester 2010: Thursday 12th of August, 1 pm (Biology Courtyard)

Below is a *sample* of current project opportunities (and the supervisory staff to contact):

- Anti-predator behaviour in glass shrimp: Do shrimp become nocturnal in the presence of competition from *Gambusia* (Culum Brown)
- A spatially explicit model for coral competition (Joshua Madin)
- Biozonation of plankton in the Subantarctic Zone (Leanne Armand)
- Boldness testing in Mosquito fish *Gambusia holbrooki*: Are bold *Gambusia* faster learners? (Culum Brown)
- Determining depth and time variations in the distribution of phytoplankton in the Polar Front and/or Subantarctic Zone (Leanne Armand)
- Do native Sydney Rock oysters and non-native Pacific oysters produce the same quantity and quality of pseudofaeces: implications for benthic productivity (Melanie Bishop)

- Drill-hole intensity amongst shallow marine bivalves: evidence of prey selectivity by drill-hole predators in shallow marine environments (Glenn Brock)
- Familiarity preference in shoaling fishes; one-way mirror test. How important is social feedback in shoal choice decisions? (Culum Brown)
- Morphological size variation due to temperature in marine diatoms (Leanne Armand)
- Organic geochemistry of Tuggerah Lakes system grab samples (Simon George)
- Restoration of mangrove forests: thresholds required for recovery of ecosystem services (Melanie Bishop)
- Southern Ocean Palaeo-ecology and climatology (Leanne Armand)
- Spatial subsidies in rock pools: patterns of seaweed accumulation (Melanie Bishop)
- The effect of *Hormosira banksii* (Neptune's necklace) on the foraging efficiency of benthic predators (Melanie Bishop)
- The importance of epibionts in fossil and modern shallow water benthic communities (Glenn Brock)
- The mechanical vulnerability of bryozoans to storm waves (Joshua Madin)
- What climate impacts are expected at the base of the food-chain with a warmer conditions along the Antarctic coast line? (Leanne Armand)
- Why are there basaltic volcanoes on the continental slope of Western Australia? (Kelsie Dadd)
- Will iron-pumped algae save the world from our carbon dioxide hot-house? (Leanne Armand)
- Will ocean acidification affect the biomechanical properties of bryozoans? (Joshua Madin)

Unit Staff

Convenor

Assoc. Prof. David Raftos (draftos@rna.bio.mq.edu.au)

Other supervisory staff

Dr. Leanne Armand (larmand@science.mq.edu.au)

Dr. Melanie Bishop (mbishop@bio.mq.edu.au)

Dr. Glenn Brock (gbrock@els.mq.edu.au)

Dr. Culum Brown (cbrown@bio.mq.edu.au)

Dr. Kelsie Dadd (kdadd@els.mq.edu.au)

Assoc. Prof. Simon George (sgeorge@els.mq.edu.au)

Assoc. Prof. Ian Goodwin (igoodwin@els.mq.edu.au)

Assoc. Prof. Rob Harcourt (rharcour@gse.mq.edu.au)

Dr. Joshua Madin (jmadin@bio.mq.edu.au)

Dr. Angela Maharaj (amaharaj@els.mq.edu.au)

Dr. Jane Williamson (jwilliamson@bio.mq.edu.au)

Technical resources

Penny McCracken (penny.mccracken@bio.mq.edu.au)

Peter Tung (ptung@bio.mq.edu.au)

Marine Science Resources

<http://www.marinescience.mq.edu.au>

Classes

Other than the start of semester meeting and final research seminars, there are no formal classes for this unit.

Assessment

Students will be assessed based on a research proposal, a final report, and a research seminar. Please submit written assessments (1 and 2 below) by email to Dr. Madin and carbon copy (CC) your project supervisor by the due dates below. There will be standard penalties for late submission (i.e., 10% of assessment grade for each day late).

1. Proposal (10% of assessment)

The research proposal must be submitted by **Friday the 27th of August**.

Requirements for proposals are:

- A brief review of the relevant literature
- A clear statement of the proposed questions and methodologies
- A project timeline that demonstrates a commitment of at least 135 hours and that the project can be completed and submitted by the end of semester
- No more than 2 pages
- Approval by the supervisory staff researcher

Having submitted an initial proposal, it is expected that you will discuss the proposed activity with all the relevant people in order to complete the details of the contract proposal and produce the final report.

2. Report (70% of assessment)

The final report must be submitted by midnight **Friday the 12th of November** (the last day of classes). Requirements for proposals are:

- A report in scientific format with the following sections: Title, Abstract, Introduction, Methods, Results, Discussion, References, and Appendices
- No more than 5000 words (not including Appendices)
- 12 point Times New Roman, 1.5 line spacing, and figures embedded between paragraphs following their first mention

A nontrivial proportion of the final report's marks are related to student initiative and enthusiasm as well as improvisational and time management skills over the course of their project.

3. Seminar (20% of assessment)

Students will present a brief research seminar about their projects. Seminars will be conducted on the first day of the exam period (**Monday the 15th of November**) starting at 10 am (coffee and cake provided). Requirements for seminars are:

- To succinctly introduce the topic, state the question and objectives, outline the methods and results, and discuss the findings using a PowerPoint presentation

- 15 minutes total time (10 minutes for the presentation and 5 minutes for audience questions). Marks will be deducted for each minute a presenter runs over the allocated 10 minutes.

The unit will be graded as one of HD, D, C, P, or F. Given that enrolment is typically below 20 students, a distribution of grades for the class is not enforced by University policy.

Unit Completion Requirements

Students must complete all (3) assessment tasks and receive a final combined grade of greater than 50% in order to pass.

Extension Requests

Extension requests for assessment tasks must be made in writing to David Raftos accompanied by a medical certificate validating the request.

Expected Learning Outcomes

On completing the course, students should have:

- Participated in a scientific collaboration
- Evaluated primary scientific literature
- Formulated an original research question
- Developed an experimental design or equivalent
- Analysed and interpreted data
- Managed research within a given timeframe
- Written in a style suitable for publishing scientific research
- Presented their work as a research seminar

Graduate Capabilities Developed

Capability	Demonstrated
Manage a research project	Throughout
Collaborate with an established research scientist	Throughout
Think in a critical and independent manor	Throughout
Extract knowledge from multiple sources (e.g., online, the scientific literature)	Proposal and Report
Judge the reliability of information sources	Proposal and Report
Formulate an original research question	Proposal
Analyse and interpret data	Report and Seminar
Able to form a logical argument using hypotheses and data	Report and Seminar
Present information in such a way as to highlight key points	Report and Seminar
Write in a style suitable for publishing scientific research	Report
Present research to the scientific community in a seminar	Seminar

Communicate key concepts using figures and tables	Report and Seminar
Complete tasks in a timely fashion	Throughout

Required and Recommended Texts/Materials

Recommended on a case-by-case basis if necessary.

Unit Web Page

<http://www.learn.mq.edu.au/>

Policies

Macquarie is developing a number of policies in the area of learning and teaching. Approved policies and associated guidelines and procedures can be found at Policy Central: <http://www.mq.edu.au/policy/>

There you will find the University's policy and associated procedures on:

- Assessment
- Academic Honesty
- Special Consideration