

Marine Ecosystem Management

Marine Ecosystem Management - MSc
BL5304 (15 credits) and BL5310 (15 credits) and BL5115 (30 credits) and 15 credits from Module List: ID5011, BL4251, BL4260, BL4262 and 45 credits from Module List: BL5124, BL4249, BL5103, BL5122, SD5004, MT5751, BL4254, BL4268 and BL5599 (60 credits)

Compulsory modules:

BL5304 Ecosystem-based Management of Marine Systems				
SCOTCAT Credits:	15	SCQF Level 11	Semester	2
Academic year:	2018/9			
Planned timetable:	To be arranged (Weeks 1 - 11)			
This module will introduce the concept of 'Ecosystem-based management', exploring its development from more simplistic, single-species approaches. Students will make case-studies in a workshop environment of iconic, managed ecosystems including the Southern Ocean and Australia's Great Barrier Reef.				
Learning and teaching methods of delivery:	Weekly contact: Lectures and seminars.			
Assessment pattern:	Coursework = 100%			
Re-assessment pattern:	Resubmission of failed item(s) of Coursework			
Module coordinator:	Prof A S Brierley			
Module teaching staff:	Team taught			

BL5310 Marine Biodiversity and Ecosystem Function				
SCOTCAT Credits:	15	SCQF Level 11	Semester	1
Academic year:	2018/9			
Planned timetable:	To be arranged			
This module provides students with an up to date understanding of topics related to the biodiversity and ecosystem function (BEF) debate. We examine the importance of biodiversity in the functioning of marine ecosystems and introduce techniques used to measure key components and complexity of marine systems. We also explore the resilience of marine systems and the impacts of key stressors on BEF such as invasive species, climate change, pollutants and harvest. The module consists of a series of lectures, student-led seminars and practical activities, including some field practicals for data collection and analysis.				
Learning and teaching methods of delivery:	Weekly contact: 2 lectures (x5 weeks), 1 seminar (x5 weeks), field work (either as one multi-day field trip or broken up in shorter periods over multiple weeks)			
Assessment pattern:	Coursework = 80%, Practical Examination = 20%			
Re-assessment pattern:	Coursework = 100%			
Module coordinator:	Dr A J Blight			
Module teaching staff:	Dr A Blight			

Biology - Marine Ecosystem Management - MSc - 2018/9 - September 2018

BL5115 Mathematical and statistical modelling for Biologists				
SCOTCAT Credits:	30	SCQF Level 11	Semester	1
Academic year:	2018/9			
Planned timetable:	To be arranged			
Maths can be used to represent processes in nature, and to predict their outcomes. We will show how a statistical model can be fitted to biological data, allowing us to improve our understanding of the system concerned and our ability to make predictions about it.				
Learning and teaching methods of delivery:	Weekly contact: 1 lecture (X 4 weeks) then 4 lectures (X 4 weeks), 4 R labs (X 5 weeks)			
Assessment pattern:	Coursework = 100%			
Re-assessment pattern:	Coursework = 100%			
Module coordinator:	Dr S C Smout			
Module teaching staff:	Dr S Smout, Dr L Rendell, Dr M Morrissey			

One of:

BL4251 Tropical Marine Biology				
SCOTCAT Credits:	15	SCQF Level 10	Semester	1
Academic year:	2018/9			
Availability restrictions:	Not automatically available to General Degree students			
Planned timetable:	To be arranged.			
The goal of this module is to examine the ecological and biological principles underpinning the major tropical marine ecosystems. The module provides an understanding of the ecological processes that control tropical marine ecosystems, and considers the organisms that are characteristic of each. All the major tropical marine habitats will be considered, but with a focus on coral reef, seagrass and mangrove ecosystems. The module also tackles topical research areas on the subject through student-led seminars, which will vary depending on the latest scientific research and the specific interests of participants. On completion of the module, students will have an understanding of coral reef, mangrove and seagrass ecology. They will understand the biology and physiology of corals and be able to identify the major phyla associated with tropical marine ecosystems. The module will also provide an understanding of the threats to tropical marine habitats, current research trends on tropical marine systems, and the scientific approaches and techniques used to tackle scientific questions relating to tropical marine biology.				
Learning and teaching methods of delivery:	Weekly contact: Lectures and seminars.			
	Scheduled learning: 21 hours		Guided independent study: 129 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 0%, Coursework = 100%			
	As used by St Andrews: Coursework = 100%			
Re-assessment pattern:	Resubmission of failed item(s) of Coursework			
Module coordinator:	Prof C Peddie			

Biology - Marine Ecosystem Management - MSc - 2018/9 - September 2018

BL4262 Environmental Drivers of Marine Habitats			
SCOTCAT Credits:	15	SCQF Level 10	Semester 1
Academic year:	2018/9		
Availability restrictions:	Not automatically available to General Degree students		
Planned timetable:	To be arranged.		
This module aims to give a broad overview of the different environmental drivers of marine ecosystems. Shorter term processes in the ocean and atmosphere as well climate define marine habitats and a series of lectures will be provided to assure that students have the broad background required to tackle primary literature in this field and can apply their knowledge within different fields of marine science. Students will present on particular focus areas within each lecture topic, based upon reading primary literature.			
Pre-requisite(s):	Permission of biology honours adviser required		
Learning and teaching methods of delivery:	Weekly contact: 2 x 2-hour seminar or lecture (x 5 weeks)		
	Scheduled learning: 20 hours	Guided independent study: 130 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 60%, Practical Examinations = 40%, Coursework = 0%		
	As used by St Andrews: 2-hour Written Examination = 60%, Coursework = 40%		
Re-assessment pattern:	2-hour Written Examination = 60%, Existing Coursework = 40%		
Module coordinator:	Dr L Boehme		

ID5011 Geographic Information Systems for Environmental Management			
SCOTCAT Credits:	15	SCQF Level 11	Semester 1
Academic year:	2018/9		
Planned timetable:	To be arranged (Weeks 1 - 5)		
This module provides an introduction to Geographic Information systems and their use in environmental problem solving. The module will be taught through a series of lectures, tutorials, laboratory classes and individual projects. The module will be assessed through class exercises and the final, short individual project. Students will be introduced to methods of acquiring, storing, analysing and displaying (2D and 3D) spatial digital data using the ArcGIS data package. An introduction to data manipulation and statistical techniques on a variety of environmental examples will be given. The module is taught within the School of Geography & Geosciences but incorporates datasets and analysis techniques used in earth and environmental science, biology, archaeology, and mathematics.			
Pre-requisite(s):	Requires a basic ability in computer skills (basic word processing, spread sheet analysis) gained through saltire if not demonstrated		
Anti-requisite(s)	You cannot take this module if you take GE5005 or take ID5010 or take ID5012		
Learning and teaching methods of delivery:	Weekly contact: 6 lectures and 14 practicals and support sessions (Weeks 1 - 6).		
	Scheduled learning: 0 hours	Guided independent study: 0 hours	
Assessment pattern:	As used by St Andrews: Coursework = 100% (portfolio 70%, Individual Project 30%)		
Re-assessment pattern:	Resubmission of failed item(s) of Coursework		
Module coordinator:	Dr C R Bates		

Biology - Marine Ecosystem Management - MSc - 2018/9 - September 2018

45 credits from:

BL5124 Predator Ecology in Polar Ecosystems - a Field Course in Antarctica				
SCOTCAT Credits:	15	SCQF Level 11	Semester	Full Year
Academic year:	2018/9			
Planned timetable:	lectures in S1, field course in S2 including 3 weeks in southern Argentina and Antarctica)			
<p>This module offers students the unique opportunity to gain theoretical and practical experience in polar ecology with special emphasis on top predators (cetaceans, pinnipeds, sea birds), ecosystem functionality and management of Antarctic marine living resources. Students will participate in a vessel-based expedition to Antarctica during the austral summer and will also explore southern Argentina. This field trip involves travelling to southern Argentina, conducting at-sea surveys during transit to/ from the Antarctic Peninsula, participating in shore-based activities, and exploring Antarctic coastal waters from small boats. Through a series of specialist lectures, workshops, on-board practicals, field excursions and dedicated observational studies students will gain in-depth understanding and critical awareness of the current scientific, conservation and management challenges of the Antarctic ecoregion. Upon return to St Andrews students will complete a specialist case study on a selected topic which will culminate in the presentation of a manuscript for submission to a journal. Participating students will need to cover all logistic expenses via payment of a substantial expedition fee.</p>				
Pre-requisite(s):	In taking this module you must have a medical certificate documenting fit for travel to remote antarctica			
Anti-requisite(s)	You cannot take this module if you take BL4301			
Learning and teaching methods of delivery:	Weekly contact: 8 x 1.5-hour lectures in S1 and several tutorials plus full day field practicals during the expedition.			
Assessment pattern:	Coursework = 100%			
Re-assessment pattern:	Resubmission of failed item(s) of Coursework			
Module coordinator:	Dr S Heinrich			
Module teaching staff:	Dr S Heinrich & Dr L Boheme			

BL4249 Scientific Diving				
SCOTCAT Credits:	15	SCQF Level 10	Semester	2
Academic year:	2018/9			
Planned timetable:	Full Time 2-3 weeks in January/February			
<p>This module will provide both theoretical and practical experience of the techniques used by scientific divers. The module is restricted to students who have an existing diving qualification (PADI Advanced Open Water Diver or BSAC Sports Diver or equivalent). Seminars during the field trip will cover diving safety, dive project planning, management, risk assessment and the theory behind underwater surveying techniques. Abroad, students will receive training in underwater marine identification, construction and deployment of underwater surveys and sampling techniques, gaining practical experience of recording, analysing and interpreting survey data. Then they conduct a mini-research project using suitable survey techniques and present their findings through a report and a presentation. There are additional costs attached to this module which the student will be expected to meet.</p>				
Pre-requisite(s):	Before taking this module you must pass BL4251. "permission of biology honours adviser required, padi advanced open water diver or bsac sports diver (or equivalent)"			
Learning and teaching methods of delivery:	Weekly contact: 8 hours per day for 2 weeks.			
Assessment pattern:	Coursework = 100%			
Re-assessment pattern:	Resubmission of failed item(s) of Coursework			
Module coordinator:	Prof C Peddie			
Module teaching staff:	Prof C Peddie, Dr M Dornelas			

BL5103 Population Biology			
SCOTCAT Credits:	15	SCQF Level 11	Semester 2
Academic year:	2018/9		
Planned timetable:	Weeks 5 - 7		
Which human activities might put a population at risk? Can we find out why a wild population appears to be in decline? This module covers the essentials of population biology and population modelling. The principles taught will provide essential background to those who are interested in future careers that involve the conservation and management of wildlife populations..			
Learning and teaching methods of delivery:	Weekly contact: 4 lectures (x 3 weeks), seminar (x 2 weeks), tutorial (x 1 week), lab (x 3 weeks)		
Assessment pattern:	Coursework = 100%		
Re-assessment pattern:	Resubmission of failed item(s) of Coursework		
Module coordinator:	Dr S C Smout		
Module teaching staff:	Team taught		

BL5122 Current Issues in Biologging			
SCOTCAT Credits:	15	SCQF Level 11	Semester 2
Academic year:	2018/9		
Planned timetable:	Weeks 1 - 4		
This module will present an introduction to biologging science: the theory and practice of logging and relaying physical and biological data using animal-attached tags. Lectures will cover the technology currently available for measuring animal movements, investigating behaviour, ecology and physiology, some of the challenges associated with tag design in terms of how data is stored and transmitted, and problems associated with data analysis and data display. Seminars will discuss some of the ethical and conservation issues that biologging science raises. Two practicals and the continuous assessment for this module introduce students to the difficulties collecting biologging data (using heart-rate dataloggers on themselves) and look at aspects of experimental design and how to write results in a publishable format. A further two practicals explore some of the methods used to view and analyse movement and diving data.			
Learning and teaching methods of delivery:	Weekly contact: 1 - 2 lectures, 1 seminar and 1 practical class each week for 4 weeks.		
Assessment pattern:	Coursework = 100%		
Re-assessment pattern:	Resubmission of failed item(s) of Coursework		
Module coordinator:	Prof S K Hooker		
Module teaching staff:	Team taught		

Biology - Marine Ecosystem Management - MSc - 2018/9 - September 2018

BL4254 Fisheries Research				
SCOTCAT Credits:	15	SCQF Level 10	Semester	2
Academic year:	2018/9			
Availability restrictions:	Not automatically available to General Degree students			
Planned timetable:	To be arranged.			
This module will provide an introduction to the utilisation of fish stocks in a sustainable way. It will focus on how the status of these stocks can be assessed, the problems associated with determining catch limits, and how advice from fisheries scientists is communicated to managers. There will be a mixture of dedicated lectures (including talks from outside experts), student-led seminars, tutorials and practical computer sessions.				
Pre-requisite(s):	Before taking this module you must pass BL3309			
Learning and teaching methods of delivery:	Weekly contact: 1 x 2-hour seminar (x 11 weeks)			
	Scheduled learning: 22 hours		Guided independent study: 128 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 30%, Practical Examinations = 45%, Coursework = 25%			
	As used by St Andrews: 1.5-hour Written Examination = 30%, Coursework = 70%			
Re-assessment pattern:	1.5-hour Written Examination = 30%, Existing Coursework = 70%			
Module coordinator:	Dr C G M Paxton			
Module teaching staff:	Dr C Paxton			

BL4268 Science Communication of Biodiversity and Conservation				
SCOTCAT Credits:	15	SCQF Level 10	Semester	2
Academic year:	2018/9			
Availability restrictions:	Not automatically available to General Degree students			
Planned timetable:	To be arranged.			
This module will focus on the scientific problems associated with the conservation and sustainable use of animals and plants, and on the way in which scientific advice on these issues is provided. Initial lectures will cover sustainable development and the precautionary principle; the causes of extinction; the economics of conservation; management of exploitation; and estimating species richness. After this student-led seminars will cover a range of more specialist issues of current concern. Practical work on population viability analysis, classifying populations using the IUCN criteria, and species richness estimation may be included.				
Pre-requisite(s):	Before taking this module you must pass BL3309			
Learning and teaching methods of delivery:	Weekly contact: 1 x 2-hour seminar (x 11 weeks) plus 6 additional 2-hour lectures during the semester			
	Scheduled learning: 34 hours		Guided independent study: 116 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 0%, Practical Examinations = 40%, Coursework = 60%			
	As used by St Andrews: Coursework = 100%			
Re-assessment pattern:	Resubmission of failed item(s) of Coursework			
Module coordinator:	Dr M A Azeredo de Dornelas			
Module teaching staff:	Dr M Dornelas			

Biology - Marine Ecosystem Management - MSc - 2018/9 - September 2018

MT5751 Estimating Animal Abundance

SCOTCAT Credits:	15	SCQF Level 11	Semester	2
Academic year:	2018/9			
Availability restrictions:	Not automatically available to General Degree students			
Planned timetable:	12.00 noon Mon (odd), Wed and Fri			
The module will introduce students to the main types of survey method for wildlife populations. It will cover simple methods in some detail and provide students with a conceptual framework for building understanding of more advanced methods. By the end of the course, students will be able to identify an appropriate assessment method for a given population, be able to design a simple survey to assess the population, and perform simple analyses of survey data. Students will get experience in using the methods via computer practical sessions involving design and analyses of surveys conducted by computer simulation.				
Pre-requisite(s):	Before taking this module you must (pass MT3507 or pass MT3508) and pass one 4000-level mt module			
Learning and teaching methods of delivery:	Weekly contact: 1.5 hrs lecture, 1 hr practical, 0.5 hr tutorial (weeks 1 - 10)			
	Scheduled learning: 30 hours		Guided independent study: 120 hours	
Assessment pattern:	As defined by QAA: Written Examinations = 50%, Practical Examinations = 0%, Coursework = 50%			
	As used by St Andrews: 2-hour Written Examination = 50%, Coursework = 50%			
Re-assessment pattern:	2-hour Written Examination = 100%			
Module coordinator:	Mr R Glennie			

SD5004 Introduction to Global Environmental Change

SCOTCAT Credits:	15	SCQF Level 11	Semester	2
Academic year:	2018/9			
Planned timetable:	2.00 pm - 4.00 pm Mon			
This module provides students of sustainable development with the scientific background to past, present and future climate change and its consequences globally. Topics covered include the functioning of the global climate system on timescales up to multi-millennial (including the responses of ice-sheets, sea-level, ocean circulation, ecosystems and carbon-cycling, soil erosion, and biodiversity) and conservation.				
Learning and teaching methods of delivery:	Weekly contact: 1 lecture (x 10 weeks), 1 seminar (x 10 weeks)			
	Scheduled learning: 20 hours		Guided independent study: 130 hours	
Assessment pattern:	As used by St Andrews: Coursework (including presentation =20%)= 100%			
Re-assessment pattern:	Coursework = 100%			
Module coordinator:	Prof D I Benn			
Module teaching staff:	Team taught			

