Roinn na Zó-eolaíochta
Scoil na nEolaíochtaí Nádúrtha
Department of Zoology
School of Natural Sciences

Lámhleabhar do Bhliain a Trí
Junior Sophister Handbook
2014/15
Cover illustration by Kevin Healy (PhD student, 2014)
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A Note on this Handbook

This handbook applies to all students taking the Zoology Programme taught by the School of Natural Sciences. It provides a guide to what is expected of you on this programme, and the academic and personal support available to you. Please retain for future reference.

The information provided in this handbook is accurate at time of preparation. Any necessary revisions will be notified to students via email and on the Zoology notice board, and will be updated on the Zoology website. Please note that, in the event of any conflict or inconsistency between the General Regulations published in the College Calendar and information contained in course handbooks, the provisions of the General Regulations will prevail.
WELCOME

The discipline of Zoology at Trinity aims to make discoveries, educate and engage society in the science of whole organism biology, ecology & conservation, with a particular focus on animals. Through our research, education and engagement with society we seek to advance scientific understanding and contribute solutions to global challenges to the environment, health and human wellbeing.

The Zoology Moderatorship provides specific knowledge about animal biology and the associated academic disciplines including physiology, ecology, conservation, embryonic development, evolution, parasitology, entomology and wildlife biology in both marine and terrestrial environments. In addition, the courses and activities undertaken through the Junior and Senior Sophister years also provide opportunities for you to learn and practice high level skills in evaluation of evidence, critical thinking, quantitative analysis and written and oral communication. This broad and transferable skill set provides you with a solid scientific framework from which to think creatively and explore the natural world and its interactions with human society.

Our graduates develop an excellent foundation for a wide range of careers. We are proud of the achievements of our graduates who have succeeded across a wide range of industries including: academic research, education, veterinary, medical, journalism, technology, banking, exploration, tourism, environmental consultancy, career development, conservation, natural resource management, public service, aquaculture and film-making. Throughout your time here we are committed to providing you with inspiration, guidance, feedback and practice to enable you to embark on fulfilling and life-long learning in zoology and the natural sciences, regardless of your destination after graduation.

We look forward to working with you during your Sophister years and trust that you will find Zoology as fascinating and rewarding as we do.

Yvonne Buckley
Professor of Zoology
& Head of Discipline

A WORD FROM THE COURSE CORDINATOR

Welcome to the Sophister programme in Zoology. Having been part of the large, General Science grouping in your Freshman years, you are now in a much smaller group of like-minded individuals who have elected to specialize in Zoology for their Moderatorship. Congratulations! The next two years will be hard work but also, we hope, fun.

In the Junior Sophister year we provide broad coverage of the areas of significance in contemporary whole organism Zoology, particularly in relation to the themes of environmental and medical biology. Along with coursework, you will select and develop a proposal for the topic of your independent research project to be carried out in the final year.

There is a lot to do in the programme and, with 50% of the credits going for continuous assessment, you will need to be on top of your game right from the start. To succeed, you will need to be self-motivated, develop good time management and excellent note taking and synthesis skills. Make use of all the resources and facilities that are available, and if you have any problems or issues with any part of the programme, speak with one of the lecturers or, better still, call in to see me in my office.

John Rochford
Zoology Course Coordinator
THE PROGRAMME

The Objectives of the Zoology Moderatorship

Zoology is the scientific study of all aspects of animal biology, from the cell to ecosystems. This encompasses a knowledge, not only of the structure and function of different species, but also of the complex relationships which govern the way in which animals relate to each other and to their surroundings. It provides an integrated view of all biological levels from the gene to the organism and higher.

Zoology provides fundamental knowledge relating to three areas of concern to society, namely the environment and its conservation, food production, and human and animal health and wellbeing. There is a growing awareness of environmental issues, including the conservation of biodiversity and the effects of climate change, to which zoologists contribute at all levels from research to policy making. Zoological research is also important in relation to food products and their pests while studies on a range of animals provide a basis for medical biology. Aspects of both environmental and medical biology feature strongly in the teaching and research programmes of the Zoology Department at TCD.

On successful completion of the two-year Sophister programme in Zoology, students will be able to:

- set out the important basic concepts and current research developments in animal biology and associated disciplines
- structure the diversity and evolution of the animal kingdom
- design useful experiments
- demonstrate technical competence in the handling of research facilities and operate safely in a laboratory environment, both individually and as a team member
- design sampling programmes and carry out fieldwork using standard procedures
- communicate effectively both orally and in a variety of contemporary scientific writing styles.
- use appropriate editing, web-based, graphical and analytical software to analyse and interpret data and prepare reports and assignments.
- critically analyse experimental results (including those obtained personally) and use appropriate statistical and other quantitative procedures for data handling
- proficiently search and critically assess scientific literature and databases
- apply a scientific approach to problem solving
- articulate the contribution, including the ethical dimension, made by Zoology to society, in the realms of the environment, agriculture, natural resource management, human behaviour and health.
Programme Overview

Junior Sophister students in Zoology follow a training programme that consists of core theory and practical modules relating to ecology, physiology and biodiversity, as well as experimental design and analysis.

In the Senior Sophister year, in addition to coursework, students will take part in interactive tutorials and seminar presentations based on detailed literature analysis. They will also carry out and write-up an independent piece of research while working with one of the departmental research groups.

Brief descriptions of all modules available to Junior Sophister students in Zoology are given in this handbook.

Bologna and the European Credit Transfer System

Under the Bologna Process, to which Ireland is a party, and which is designed to encourage student mobility and the international recognition of qualifications, the European Credit Transfer and Accumulation System (ECTS) has been introduced in Trinity College Dublin, and applies to all undergraduate and taught postgraduate programmes.

ECTS credits represent the student workload required to achieve the desired outcomes of modules and programmes, where 60 credits is the norm for full-time study over one full academic year. It should be noted that as one ECTS credit is considered to account for between 20 and 25 hours of student participation in a course, 60 credits, therefore, amounts to between 1,200 and 1,500 hours - that is an average of 40 to 50 hours per week over the 30 weeks of the University year. In Science and Technology, approximately 30-40% of that total may involve ‘contact hours’.

The ECTS credit weighting for a given module is a measure of the student input or workload required for that module, based on factors such as the number of contact hours, the number and length of written or verbally presented assessment exercises, class preparation and private study time, laboratory classes, examinations, and so on as appropriate. There is no intrinsic relationship between the credit weighting of a module and its level of difficulty.

Credits are obtained by individual students upon successful completion of the academic year or programme. However, one-year and part-year visiting students are awarded credit for all individual modules successfully completed.

Junior Sophister students in Zoology take 55 credits of ‘Core’ Modules, and a 5 credit ‘Broad Curriculum’ Module to make up the 60 credit academic year (see below).
Summary of the Junior Sophister Programme

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title</th>
<th>ECTS Credits</th>
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</thead>
<tbody>
<tr>
<td><strong>CORE MODULES (30 Credits)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZO3000</td>
<td>Marine Biology</td>
<td>5</td>
</tr>
<tr>
<td>ZO3003</td>
<td>Animal Diversity</td>
<td>10</td>
</tr>
<tr>
<td>ZO3020</td>
<td>Behavioural Ecology</td>
<td>5</td>
</tr>
<tr>
<td>ZO3030</td>
<td>Parasitology</td>
<td>5</td>
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<tr>
<td>ZO3040</td>
<td>Comparative Physiology</td>
<td>5</td>
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<tr>
<td>ZO3050</td>
<td>Introduction to Developmental Biology</td>
<td>5</td>
</tr>
<tr>
<td>ZO3070</td>
<td>Experimental Design and Analysis</td>
<td>5</td>
</tr>
<tr>
<td>ZO3085</td>
<td>Wildlife Biology and Terrestrial Ecology</td>
<td>5</td>
</tr>
<tr>
<td>BO3105</td>
<td>Fundamentals of Ecology</td>
<td>5</td>
</tr>
<tr>
<td>BO3122</td>
<td>Entomology</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Broad Curriculum</td>
<td>5</td>
</tr>
</tbody>
</table>

Please note: Students are expected to make a contribution to the transport and accommodation costs of the field trips, which is usually between €200 – €250. Eligible students may apply to the Student Assistance Fund (http://www.tcd.ie/Senior_Tutor/) for financial assistance.
Broad Curriculum Modules

Attendance at a Broad Curriculum module (5 credits) is mandatory, and exceptions will only be made where no suitable Broad Curriculum module is available. In addition to the Cross-Faculty modules listed below, students may choose from one of a number of language modules, offered by the Centre for Language and Communication Studies (CLCS) at any one of four levels. See (https://www.tcd.ie/Broad_Curriculum/index.php) for further details. All places are allocated on a first-come, first-served basis and strictly subject to timetable constraints. Any queries regarding cross-faculty modules should be addressed to bccourse@tcd.ie and regarding language modules, to cicsinfo@tcd.ie.

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title</th>
<th>School</th>
</tr>
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<tbody>
<tr>
<td>BCASIA</td>
<td>Introduction to Contemporary Asian Studies</td>
<td>Centre for Asian Studies (Dr Lorna Carson)</td>
</tr>
<tr>
<td>BCENG</td>
<td>Understanding Literature</td>
<td>English (Dr Ema Vyroubalova)</td>
</tr>
<tr>
<td>BCHA2</td>
<td>Making and Meaning in Irish Art II</td>
<td>Histories and Humanities (Dr Angela Griffith)</td>
</tr>
<tr>
<td>BCLNG1</td>
<td>Language, the individual and society</td>
<td>Linguistic, Speech and Communication Sciences (Ms Denise O’Leary)</td>
</tr>
<tr>
<td>BCPS2</td>
<td>Social Psychology</td>
<td>Psychology (Dr Jean Quigley)</td>
</tr>
<tr>
<td>BCSCI</td>
<td>Idea Translation Lab</td>
<td>Science Gallery (Dr Joseph Roche)</td>
</tr>
<tr>
<td>BCSOC2</td>
<td>European Societies</td>
<td>Social Sciences and Philosophy (Dr Peter Muhlau)</td>
</tr>
<tr>
<td>BCSOC3</td>
<td>Power, State and Social Movements</td>
<td>Social Sciences and Philosophy (Dr Camilla Devitt)</td>
</tr>
</tbody>
</table>

To check times/day/venue of Broad Curriculum modules please see the timetable on the Broad Curriculum Webpage.

https://www.tcd.ie/Broad_Curriculum/cross-faculty-modules/timetable.php
**Brief Description of Junior Sophister Modules**

*Where more than one lecturer is involved, the name of the module coordinator is given in italics*

**ZO3000  Marine Biology**

(5 credits – Michaelmas Term – 5 day field course plus 10 contact hours)

**Module Personnel:**
Prof. Jim Wilson, Dr Frank Jeal

**Module Content:**
This two-part module, which also serves as an introduction to the Zoology programme and Department, begins in week 5 with a residential field course, based at the Queen’s University marine facility at Portaferry, Co Down. The emphasis is on learning about the great variety of form and habit in marine organisms and the student is introduced to taxonomy and the morphology of many of the major invertebrate phyla, as well as more practical aspects of marine biology in general. This is then supplemented by a series of lectures throughout the Michaelmas Term, covering such topics as the variety of marine habitats; seasonal cycles and distribution of planktonic organisms; the sea shore and its zonation; hard and soft substrates; the benthos; seafloor sediments and infauna as well as such special habitats as the deep sea, coral reefs and polar waters, among others.

**Learning Outcomes:**
On successful completion of this module, students will be able to:
1. classify and map intertidal habitats and sketch zonation patterns on temperate rocky shores,
2. identify and draw a range of marine invertebrate and fish specimens and list the factors which control their distribution on the shore.
3. classify and map intertidal habitats.
4. know, in broad terms, the composition of seawater and describe the nature and role of marine plankton and the benthos.
5. describe the basic ecological features of a range of special marine habitats.

**Recommended Reading List:**

**Assessment Details:**
50% continuous assessment (based on field course notebooks and the level of general participation):
50% annual written examination.
ZO3003 Animal Diversity

(10 credits – Michaelmas Term – 80 contact hours)

Module Personnel:
Dr Ian Donohue, Prof. Jim Wilson, Dr Frank Jeal

Module Content:
This team-taught module provides a detailed consideration and comparison of the structure, life cycles and general biology of animal groups, based on lectures and practicals, with additional self-learning exercises. The practical work involves dissections, observation of living specimens, and demonstrations of material from the Zoological Department’s extensive collections. In the first part of the module (before the study week) the main themes will be the protostome coelomates, including the annelids, molluscs and arthropods, although other invertebrate taxa, including the minor phyla, are also covered. After the study week, the emphasis shifts to the vertebrates and their nearest relatives (the deuterostome coelomates). Morphological adaptations and evolutionary aspects of the vertebrate groups will be exemplified by skeletal and preserved material, made available for examination by the students.

Learning Outcomes:
On successful completion of this module, students will be able to:
1. organise the invertebrates into a phylogenetic dendrogram and list the diagnostic ID features of the major invertebrate taxa.
2. give examples of the following levels of organization – Protists; Mesozoa and Parazoa; diploblasts and triploblasts; acoelomates, pseudocoelomates and coelomates – and sketch the diagnostic body plan/structure and function (‘Bauplan’) of the major taxa
3. give examples of the major taxa and their relative importance/abundance and summarise the ecological importance and niche of selected exemplars.
4. explain recent views on the origins of the vertebrates and appreciate the palaeontological, anatomical and genetic evidence for such views
5. describe the basic anatomy, and adaptive features of the vertebrate classes and give a reasoned identification of representative specimens of the classes (and in some cases orders & families) of the vertebrates.
6. review the palaeontological evidence for such evolutionary transitions as the conquest of the land by tetrapods; the origin and radiation of amniotes; the evolutionary transition from dinosaurs to birds, and the evolution of endothermy and the mammals
7. report the recent classification of the mammals together with the biogeographical and molecular evidence for this classification.

Recommended Reading List:

Assessment Details:
50% continuous assessment (including 2 practical spot-tests): 50% annual written examination.
**BO3105  Fundamentals of Ecology**

(5 credits – Michaelmas Term – 35 Contact Hours)

**Module Personnel:**  
Dr I. Donohue, Prof. Y. Buckley, Prof. F. Mitchell

**Module Content**  
This module, run jointly with the Botany Department, examines the factors that affect the distribution, growth and survival of plant and animal communities. It describes how organisms interact with their environment and the role that they have in ecosystem and community structure. There is an introduction to the concepts and models that help to explain and predict organism distributions and interactions. The module comprises interrelated components of lectures, practical sessions and fieldwork. It has been designed to provide a foundation to ecological theory and its application.

**Learning Outcomes:**  
On successful completion of this module, students will be able to:
1. define what we mean by ecology and have been provided with a firm base for its principles and practice
2. discuss methodological and theoretical aspects relating to our understanding of the distribution and abundance of species
3. describe and evaluate unifying concepts of distributions and ecological processes (e.g. feeding strategies, interspecific interactions etc.)
4. show, through practical exercises, a good approach to project work Communicate more effectively through a variety of techniques

**Recommended Reading List:**  

**Assessment Details:**  
50% continuous assessment: 50% annual written examination.
ZO3020 Behavioural Ecology

(5 credits – Hilary Term – 30 Contact Hours)

Module Personnel:
Dr N. Marples

Module Content:
This lecture and practical module gives a broad grounding in the theoretical and practical basis of behavioural ecology. The subject is introduced with an overview of the diverse influences on an animal’s behaviour. Following this, the roles of perception and attention in learning are explored, before moving on to a more classic behavioural ecology course, covering how animals obtain food, avoid predators, breed and communicate. The practical work provides students with experience in studying behaviour in both the field and the laboratory, and provides training in behavioural recording techniques. It guides students through appropriate statistical analysis of the data sets collected in the practicals, and in their presentation in written form. It includes work with live animals both in the laboratory and at Dublin Zoo.

Learning Outcomes:
On successful completion of this module, students will be able to:
1. outline the basic principles of behavioural ecology supported by a number of experimental examples
2. appreciate the uses of theoretical modelling relating to behavioural studies.
3. recognise the breadth of influences on an animal’s behaviour.
4. have experience of the practical aspects of studying animal behaviour and the ability to design and carry out quantitative behavioural observations.
5. carry out, analyse and write up simple experiments on animal behaviour.
6. appreciate the use of the most common statistical tests used in behavioural analysis.

Recommended Reading List:


Assessment Details:
50% continuous assessment: 50% annual written examination.
ZO3030  Introduction to Parasitology

(5 credits – Hilary Term – 30 Contact Hours)

Module Personnel:
Prof. C. Holland

Module Content:
The significance of the host-parasite relations and the processes associated with the definition of parasitism are discussed in this module. Examples from important parasite phyla are reviewed with a focus upon life cycle strategies, ecology, pathology and control. The epidemiology of parasitic diseases including important differences between microparasites and macroparasites are defined. The significance of parasite distributions within host populations is highlighted. External and internal factors, which influence parasite populations, are outlined and particular attention is paid to host behaviour, genetics and immunity. The concept of a parasite community at the infracommunity and component community level is developed. The practical work provides access to a wide range of parasitic material and gives emphasis to the diversity of parasitic lifestyles and forms. A number of the sessions are experimental in nature and explore parasitic adaptations for infection, the significance of parasite distributions in infected hosts, behavioural changes in parasitised hosts and the nature of parasite communities.

Learning Outcomes:
On successful completion of this module, the student will be able to:
1. know the broad context of the host-parasite relationship and recall key definitions of parasitism.
2. identify a range of parasites from four major groups and recognize the epidemiological differences between microparasites and macroparasites
3. explore three internal factors that influence parasite populations and develop an understanding of strategies for parasite control.
4. locate and identify parasites from a range of hosts in the laboratory and simulate parasite activation.
5. sample hosts for parasite community analyses.
6. design experiments on the impact of parasitism upon host fitness and write up the results of a laboratory experiment in the form of a scientific paper.

Recommended Reading List:

Assessment Details:
50% continuous assessment (practical write-up): 50% annual written examination.
**ZO3040 Comparative Physiology**

(5 credits – Michaelmas Term – 35 Contact Hours)

**Module Personnel:**
Prof. P. Wilson, Dr. M. Wride

**Module Content:**
This module includes lectures and a practical component, including demonstrations, histology and hands-on dissection, using examples drawn from the animal kingdom. Living animals adjust their physiological mechanisms to successfully deal with the environment, which is their natural habitat. Various adaptations are explored based on, for example, the adaptations of the respiratory system that enable some mammals to dive deep into the ocean to feed, the adaptation of the excretory system that enable animals to survive in arid conditions. The systems are compared in mammals, reptiles, fishes and birds.

**Learning Outcomes:**
On successful completion of this module, the student will be able to:
1. describe the mechanisms that different animals use to carry out respiration, thermoregulation, excretion, homeostasis, digestion and reproduction.
2. describe the comparative physiology and anatomy of the cardiovascular systems and nervous system.
3. outline the nature of the special senses, focusing on the comparative physiology of the eye in different animals.

**Recommended Reading List:**


Publisher – Palgrave Macmillan, Basingstoke (ISBN 9780878933174)

**Assessment Details:**
50% continuous assessment: 50% annual written examination.
ZO3050 Introduction to Developmental Biology

(5 credits – Michaelmas Term – 35 Contact Hours)

Module Personnel:
Dr P. Murphy

Module Content:
This module consists of a series of lectures, tutorials and practical sessions that deals with a range of topics in Developmental Biology emphasising a molecular approach to understanding the principles of animal development. A number of animal model systems will be dealt with and the contribution of each to our overall understanding of development discussed. Specific topics will include the following: Developmental genetics: the identification of genes that regulate development in Drosophila and vertebrates; Positional determination: how the body plan of the embryo is laid down including the role of homeo-box genes; Induction: the role of cell and tissue interactions and signalling cascades; Developmental neurobiology: positional determination within the vertebrate central nervous system, neuronal diversity and axonal guidance, neural crest cells and development of the peripheral nervous system. Other topics include limb development, organogenesis, and evolutionary developmental biology.

Learning Outcomes:
On successful completion of this module, the student will be able to:
1. describe the key principles of embryonic development.
2. describe the model animals that are used for developmental studies and explain why they have been so important.
3. describe the key events in building a complex multicellular animal (the common and species-specific features).
4. integrate an understanding of molecular control of cell differentiation and the key molecules involved with morphological events in the embryo (e.g. the molecules associated with neural tube patterning).
5. observe and identify key features of vertebrate embryos and use morphological criteria to uncover the stage of embryonic development.
6. identify internet resources that aid modern developmental research and, working in groups, carry out desk-top research using genome project resources.
7. demonstrate improved their writing and presentation skills through tutorial assignments and feedback.

Recommended Reading List:
Publisher – Oxford University Press, Oxford. (ISBN 9780199549078 (pbk.)/9780199554287 (hbk.))

Assessment Details:
50% continuous assessment (laboratory report and tutorial assignments): 50% annual written examination.
ZO3070  Experimental Design and Analysis

(5 credits – Hilary Term – 28 Contact Hours – Core Module)

Module Personnel:
Prof. C. Holland

Module Content:
This module, designed specifically for Zoologists, Functional Biologists, Plant Scientists and Environmental Scientists will aim to put data collection and analysis in the context of research design and will be an important foundation for the Senior Sophister research project. The module consists of two parts. The emphasis will be practical with a more ‘hands on’ approach rather than the theory of statistics. Initially students will be taught about experimental design, data collection and sampling and the use of spreadsheets for data entry. This will lead on to preliminary data exploration and issues of normality. Emphasis will be placed upon the importance of visually exploring the data prior to the use of statistical tests. Summary statistics, including measures of centre and spread, skewness, kurtosis, percentiles and boxplots, will be covered. Then the module will move on to explore the concept of hypothesis testing and the need to compare two or more means. This will involve the use of t-tests and analysis of variance. Other types of data will also be introduced including the analysis of frequencies. The relationship between two variables in the context of regression analysis will also be explored. Finally a data set will be used to bring the entire process together starting with simple data exploration through summary statistics to more complex analyses.

The aim of the second part of the module is to address, in more detail, the fundamentals of experimental design and to explore how previous projects were conducted. In addition, students will learn how to write a moderatorship project proposal.

Learning Outcomes:
On successful completion of this module, the student will be able to:
1. address the fundamentals of experimental design and use hypothesis testing to answer biological questions.
2. appreciate instruments for data collection, and how to explore and analyse data within the context of research design.
3. code data using an Excel spreadsheet and explore these data using graphical and summary techniques.
4. outline the requirements of parametric statistical tests and recognize the applicability of four such tests.
5. calculate statistical tests by hand and use the statistical package R to explore and analyse data.
6. write a moderatorship project proposal, design an experiment and analyse the findings of a scientific paper in a group setting.

Recommended Reading List:

Assessment Details:
50% continuous assessment (three assessments – data analysis exercise (Part 1), designing an experiment, writing a moderatorship project proposal (Part 2). 50% annual written examination.
ZO3085  Wildlife Biology and Terrestrial Ecology

(5 credits – Hilary Term – 5 day field course plus 15 contact hours)

Module Personnel:
Dr John Rochford, Dr Nicola Marples, Prof. Yvonne Buckley

Module Content:
This two-part module begins with a series of lectures in Hilary Term, which offer an introduction to terrestrial biodiversity and wildlife biology, both globally and regionally. Topics covered will include: assessment of biodiversity from individual, population, community and landscape scales and the importance of foraging ecology, habitat selection, inter- and intra-specific competition, territoriality, dispersion, population dynamics and regulation for determining diversity and distribution of animals. There will also be a particular focus on the origins, development and current status of the Irish vertebrate fauna. The lecture series will be complemented, in week 34, by a five day residential field course in Glendalough, Co Wicklow, during which field techniques used for the study of terrestrial ecosystems will be introduced, with an emphasis on habitat and population assessment of mammals, insects and birds and their interactions with plants and the abiotic environment. Field visits will help with an understanding of contrasting habitats and approaches to conservation management. Students will carry out and present a mini-project during the last two days of the course.

Learning Outcomes:
On successful completion of this elective, the student will be able to:
1. demonstrate the relationship between determinants of the patterns of terrestrial biodiversity and the practice of wildlife management and conservation
2. recognise and evaluate the main factors influencing the conservation status of species, in particular habitat selection and requirements, population processes and interspecific interactions
3. explain the origin, diversity and status of the current Irish vertebrate fauna.
4. census mammals and insects safely using a variety of the most commonly used methods, and birds by sight and song.
5. construct habitat maps and appreciate the importance of scale in such maps.
6. assess anthropogenic effects on the environment and evaluate some control measures used to minimise them in nature reserves.
7. design, conduct and present a small scale field study investigating an ecological question.

Recommended Reading List:

Assessment Details:
50% continuous assessment (based on project, field notebook and presentation, all completed during the course): 50% annual written examination.
BO3122  Entomology

(5 credits – Hilary Term – 30 Contact Hours)

Module Personnel:
Dr J. Stout

Module Content:
There are more species of insects on Earth than any other group of organisms and they are of massive ecological and economic importance. This module will address behavioural, social, ecological and applied aspects of entomology, including their role in delivering ecosystem services (such as biocontrol and pollination), invasive species (such as fire ants and harlequin ladybirds) and conservation (both in Ireland and internationally). The practicals will provide students with the skills for sampling and identification of insects, which will be further enhanced through small group and individual projects.

Learning Outcomes:
On successful completion of this module, the student will be able to:
1. categorise insects according to their key features into the main order groups; know the distinction between insects and other arthropods
2. describe some of the range of behaviours employed by insects for foraging, defending and reproducing
3. develop understanding of the role of insects in ecosystem processes and their interactions with other organisms and explain their value as providers of “ecosystem services”
4. quantify the economic importance of insects (both positive and negative) to humans
5. evaluate the conservation biology of insects at national and international levels
6. design sampling procedures that are appropriate for specific hypothesis-testing

Assessment Details:
50% continuous assessment (submission of work from practicals, case study, poster presentation and report): 50% annual written examination.
PROGRAMME REGULATIONS

Attendance

Attendance at all lectures, tutorials and practical sessions is compulsory for Junior Sophister students in Zoology (see College Calendar, Section H – General Regulations and Information). Students who have been unable, through illness or other unavoidable cause, to attend any part of the course are required to notify the relevant lecturer and submit a medical certificate or other relevant document to the Executive Officer in the Zoology Department Office on the day of their return to College. Attendance at all sessions will be recorded and unexplained absence on any more than two occasions may result in a Non-Satisfactory return, following an interview with the Coordinator of the Zoology Moderatorship. Students reported as Non-Satisfactory in the Michaelmas and Hilary terms of a given year may be refused permission to take their annual examinations and may be required by the Senior Lecturer to repeat their year.

In-course Assessment

Most Zoology modules are assessed, at least in part, by work completed during or immediately after the delivery of the module (practical write-ups, spot-tests, mini projects, web CT exercises, laboratory reports, etc.).

• The dates for completion and submission of individual in-course assessments, and other pertinent information, will be given to you at the start of each module by the module coordinator, and will be displayed on the Zoology notice board and website – provisional dates are also listed at the back of this handbook.
• Completed work should be submitted to the Executive Officer in the Zoology Department Office and the appropriate forms signed and countersigned.
• Work submitted after the due date WILL have marks deducted at the rate of 5% of the marks, per day, unless good cause (e.g. medical certificate) is provided. Assessments received one week or more after the due date will receive no mark.
• Assessment marks may be obtained from the Executive Officer approximately three weeks after the submission date.
Plagiarism

Please read carefully and note the following excerpt from Section H – General Regulations and Information of the College Calendar for 2014-15:

81 Plagiarism is interpreted by the University as the act of presenting the work of others as one’s own work, without acknowledgement. Plagiarism is considered as academically fraudulent, and an offence against University discipline. The University considers plagiarism to be a major offence, and subject to the disciplinary procedures of the University.

82 Plagiarism can arise from deliberate actions and also through careless thinking and/or methodology. The offence lies not in the attitude or intention of the perpetrator, but in the action and in its consequences. Plagiarism can arise from actions such as:

(a) copying another student’s work;
(b) enlisting another person or persons to complete an assignment on the student’s behalf;
(c) quoting directly, without acknowledgement, from books, articles or other sources, either in printed, recorded or electronic format;
(d) paraphrasing, without acknowledgement, the writings of other authors.

Examples (c) and (d) in particular can arise through careless thinking and/or methodology where students:

(i) fail to distinguish between their own ideas and those of others;
(ii) fail to take proper notes during preliminary research and therefore lose track of the sources from which the notes were drawn;
(iii) fail to distinguish between information which needs no acknowledgement because it is firmly in the public domain, and information which might be widely known, but which nevertheless requires some sort of acknowledgement;
(iv) come across a distinctive methodology or idea and fail to record its source.

All the above serve only as examples and are not exhaustive. Students should submit work done in co-operation with other students only when it is done with the full knowledge and permission of the lecturer concerned. Without this, work submitted which is the product of collusion with other students may be considered to be plagiarism.

83 It is clearly understood that all members of the academic community use and build on the work of others. It is commonly accepted also, however, that we build on the work of others in an open and explicit manner, and with due acknowledgement. Many cases of plagiarism that arise could be avoided by following some simple guidelines:

(i) Any material used in a piece of work, of any form, that is not the original thought of the author should be fully referenced in the work and attributed to its source. The material should either be quoted directly or paraphrased. Either way, an explicit citation of the work referred to should be provided, in the text, in a footnote, or both. Not to do so is to commit plagiarism.
(ii) When taking notes from any source it is very important to record the precise words or ideas that are being used and their precise sources.
(iii) While the Internet often offers a wider range of possibilities for researching particular themes, it also requires particular attention to be paid to the distinction between one’s own work and the work of others. Particular care should be taken to keep track of the source of the electronic information obtained from the Internet or other electronic sources and ensure that it is explicitly and correctly acknowledged.
It is the responsibility of the author of any work to ensure that he/she does not commit plagiarism.

Students should ensure the integrity of their work by seeking advice from their lecturers, tutor or supervisor on avoiding plagiarism. All schools and departments should include, in their handbooks or other literature given to students, advice on the appropriate methodology for the kind of work that students will be expected to undertake.

If plagiarism as referred to in §81 above is suspected, in the first instance, the head of school, or designate, will write to the student, and the student’s tutor advising them of the concerns raised and inviting them to attend an informal meeting with the head of school, or designate, and the lecturer concerned, in order to put their suspicions to the student and give the student the opportunity to respond. The student will be requested to respond in writing stating his/her agreement to attend such a meeting and confirming on which of the suggested dates and times it will be possible for the student to attend. If the student does not in this manner agree to attend such a meeting, the head of school, or designate, may refer the case directly to the Junior Dean, who will interview the student and may implement the procedures as referred to under CONDUCT AND COLLEGE REGULATIONS §2.

If the head of school, or designate, forms the view that plagiarism has taken place, he/she must decide if the offence can be dealt with under the summary procedure set out below. In order for this summary procedure to be followed, all parties attending the informal meeting as noted in §82 above must state their agreement in writing to the head of school, or designate. If the facts of the case are in dispute, or if the head of school, or designate, feels that the penalties provided for under the summary procedure below are inappropriate given the circumstances of the case, he/she will refer the case directly to the Junior Dean, who will interview the student and may implement the procedures as referred to under CONDUCT AND COLLEGE REGULATIONS §2.

If the offence can be dealt with under the summary procedure, the head of school, or designate, will recommend to the Senior Lecturer one of the following penalties:

(a) that the piece of work in question receives a reduced mark, or a mark of zero; or
(b) if satisfactory completion of the piece of work is deemed essential for the student to rise with his/her year or to proceed to the award of a degree, the student may be required to re-submit the work. However the student may not receive more than the minimum pass mark applicable to the piece of work on satisfactory re-submission.

Provided that the appropriate procedure has been followed and all parties in §86 above are in agreement with the proposed penalty, the Senior Lecturer may approve the penalty and notify the Junior Dean accordingly. The Junior Dean may nevertheless implement the procedures as referred to under CONDUCT AND COLLEGE REGULATIONS §2.

Notwithstanding the above, written work submitted may be scanned by plagiarism detection software, such as ‘Turnitin.com’, with marks being deducted based on the level of plagiarism detected. Where the score returned is 61% or higher, no mark will be awarded and the matter will be referred to the Zoology Moderatorship Coordinator and Head of Discipline for further action.

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1 The director of teaching and learning (undergraduate) may also attend the meeting as appropriate. As an alternative to their tutor, students may nominate a representative from the Students’ Union to accompany them to the meeting.
Junior Sophister Examinations

The grade for each student at the end of the Junior Sophister year is compiled from the results of the annual examination in the Trinity Term and work assessed throughout the year.

The Junior Sophister examination in Trinity Term 2015 will consist of a number of 1.5 and 3 hour written papers (timetable to be announced later). The number of questions per module and the marks allocated relate to its ECTS credit value. Past examination papers are available on the College web at:

https://www.tcd.ie/vpcao/administration/examinations/information-for-students.php.

Balance of Marks

The balance of marks awarded for written examinations (EX) and in-course assessment (CA) for each module is shown below. There is full internal compensation between components of the module marks.

<table>
<thead>
<tr>
<th>CORE MODULES</th>
<th>EX</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZO3000 Marine Biology</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>ZO3003 Animal Diversity</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>ZO3020 Behavioural Ecology</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>ZO3030 Parasitology</td>
<td>50%</td>
<td>50%</td>
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<tr>
<td>ZO3040 Comparative Physiology</td>
<td>50%</td>
<td>50%</td>
</tr>
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<td>ZO3050 Introduction to Developmental Biology</td>
<td>50%</td>
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</tr>
<tr>
<td>ZO3070 Experimental Design and Analysis</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>ZO3085 Wildlife Biology and Terrestrial Ecology</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>BO3105 Fundamentals of Ecology</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>BO3122 Entomology</td>
<td>50%</td>
<td>50%</td>
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<tr>
<th>BROAD CURRICULUM</th>
<th></th>
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<tr>
<td>BC———Broad Curriculum Module</td>
<td></td>
<td>100%</td>
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</tbody>
</table>

The Junior Sophister examinations (assessments and papers) form Part 1 of the examinations for the Moderatorship in Zoology, contributing 20% to the overall degree award, with the remaining 80% coming from the Senior Sophister examinations. The Harmonized Assessment and Progression Regulations (Model 2), as adopted by Council in 2012, shall apply to all examinations in Zoology. For further details, see:

https://www.tcd.ie/local/genesis/assets/pdf/HarmonisationRegulations_UG.pdf

and the TR071 Science Course Junior Sophister Examination Regulations, reproduced on page 24 (below).
**Grading Guidelines**

The following guidelines are used when awarding grades for essays and examination answers in the Sophister years in Zoology

<table>
<thead>
<tr>
<th>Class</th>
<th>Mark Range</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>90-100</td>
<td><strong>EXCEPTIONAL ANSWER</strong>&lt;br&gt;This answer will show original thought and a sophisticated insight into the subject, and mastery of the available information on the subject. It should make compelling arguments for any case it is putting forward, and show a rounded view of all sides of the argument. In exam questions, important examples will be supported by attribution to relevant authors, and while not necessarily giving the exact date, should show an awareness of the approximate period. In essays, the referencing will be comprehensive and accurate.</td>
</tr>
<tr>
<td>I</td>
<td>80-89</td>
<td><strong>OUTSTANDING ANSWER</strong>&lt;br&gt;This answer will show frequent originality of thought and make new connections between pieces of evidence beyond those presented in lectures. There will be evidence of awareness of the background behind the subject area discussed, with evidence of deep understanding of more than one view on any debatable points. It will be written clearly in a style which is easy to follow. In exams, authors of important examples may be provided. In essays all important examples will be referenced accurately.</td>
</tr>
<tr>
<td>II-1</td>
<td>70-79</td>
<td><strong>INSIGHTFUL ANSWER</strong>&lt;br&gt;Showing a grasp of the full relevance of all course material discussed, and will include one or two examples from wider reading to extend the arguments presented. It should show some original connections of concepts. There will be only minor errors in examples given. All arguments will be entirely logical, and well written. Referencing in exams will be sporadic but referencing should be present and accurate in essays.</td>
</tr>
<tr>
<td>II-1</td>
<td>65-69</td>
<td><strong>VERY COMPREHENSIVE ANSWER</strong>&lt;br&gt;good understanding of concepts supported by broad knowledge of subject. Notable for synthesis of information rather than originality. Evidence of relevant reading outside lecture notes and coursework. Mostly accurate and logical with appropriate examples. Occasionally a lapse in detail.</td>
</tr>
<tr>
<td>II-1</td>
<td>60-64</td>
<td><strong>LESS COMPREHENSIVE ANSWER</strong>&lt;br&gt;mostly confined to good recall of coursework. Some synthesis of information or ideas. Accurate and logical within a limited scope. Some lapses in detail tolerated. Evidence of reading assigned course literature.</td>
</tr>
</tbody>
</table>
| II-2 | 55-59 | **SOUND BUT INCOMPLETE ANSWER**  
based on coursework alone but suffers from a significant omission, error or misunderstanding. Usually lacks synthesis of information or ideas. Mainly logical and accurate within its limited scope and with lapses in detail. |
|------|-------|---|
|      | 50-54 | **INCOMPLETE ANSWER**  
suffers from significant omissions, errors and misunderstandings, but still with understanding of main concepts and showing sound knowledge. Several lapses in detail. |
| III  | 45-49 | **WEAK ANSWER**  
limited understanding and knowledge of subject. Serious omissions, errors and misunderstandings, so that answer is no more than adequate. |
|      | 40-44 | **VERY WEAK ANSWER**  
a poor answer, lacking substance but giving some relevant information. Information given may not be in context or well explained, but will contain passages and words which indicate a marginally adequate understanding. |
| Fail | 35-39 | **MARGINAL FAIL**  
inadequate answer, with no substance or understanding, but with a vague knowledge relevant to the question. |
|      | 30-34 | **CLEAR FAILURE**  
some attempt made to write something relevant to the question. Errors serious but not absurd. Could also be a sound answer to the misinterpretation of a question. |
|      | 0-29  | **UTTER FAILURE**  
with little hint of knowledge. Errors serious and absurd. Could also be a trivial response to the misinterpretation of a question. |

**The J.B. Gatenby Prize**

This prize, founded in 1968 by Mrs R.R. Edwards in memory of the late Professor J.B. Gatenby, is awarded annually to the member of the Junior Sophister class who carried out the best practical work during the year. Current value - €65.
JUNIOR SOPHISTER STUDENTS:
SCIENCE (TR071)
HUMAN GENETICS (TR073)
CHEMISTRY WITH MOLECULAR MODELLING (TR074)
MEDICINAL CHEMISTRY (TR075)
NANOSCIENCE, PHYSICS AND CHEMISTRY OF ADVANCED MATERIALS (TR076)
EARTH SCIENCES (TR077)

1. GENERAL COLLEGE REGULATIONS
General College regulations with regard to examinations shall apply to all examinations in Science as set out in Section H (Page H1) of the University Calendar 2013/14
http://www.tcd.ie/calendar/assets/pdf/2013-14/TCDH.pdf

2. EXAMINATION REGULATIONS – JUNIOR SOPHISTER

2.1. Timetables for all Sophister examinations are published in advance of the dates of the examinations, and available on-line on the College website. The onus lies on each student to find out the dates of examinations by consulting these timetables. No timetables or reminders will be sent to any individual student.
http://www.tcd.ie/vpcao/administration/examinations/information-for-students.php

2.2. Junior Sophister students must, in the first instance, sit the annual examination and meet the requirements of the course.

2.3 The Junior Sophister Annual Examination has a two-fold purpose. It is (a) the final examination for the Ordinary BA degree and (b) a qualifying examination to proceed to the Senior Sophister year as a Moderatorship candidate. A student who rises to, and completes, the Senior Sophister year, but fails the Moderatorship examination, is still qualified for the award of an Ordinary BA degree on the basis of a successful performance in the Junior Sophister examination.

Students who pass the Junior Sophister examination can have the Ordinary BA degree conferred if they do not choose, or are not qualified to proceed to Moderatorship. Except by special permission of the University Council, on the recommendation of the Course Director, the ordinary degree of BA may be conferred only on candidates who have spent at least three years in the course.

2.4 To pass the Junior Sophister examination, students must achieve an overall credit-weighted average mark of 40% and accumulate 60 credits by (a) passing all modules outright or (b) passing by compensation or aggregation and accumulation.
2.5 To compensate / aggregate students must

(i) obtain an overall mark of 40% or higher **AND**

(ii) obtain individual marks of 40% or higher in modules to the value of 40 credits with a minimum mark of 30% in the each of the failed modules up to a maximum of 20 credits.

**OR (aggregate)**

(iii) obtain individual marks of 40% or higher in modules to the value of 40 credits with a minimum mark of 30% in additional modules of at least 10 credits.

2.6 To qualify to proceed to Moderatorship, students sitting the Junior Sophister examination for the first time must pass the year and achieve a mark of 45% or higher in the overall examination.

2.7 Students who achieve an overall grade of 35% or higher, but who are not qualified to proceed to Moderatorship can repeat the Junior Sophister year in order to qualify to proceed to Moderatorship or qualify for an Ordinary BA degree.

2.8 Students whose overall mark is 34% or lower in the annual examinations are not permitted to repeat their year and must withdraw from the course.

2.9 If a student’s examination result indicates the remark ‘See tutor’, the student must contact their tutor immediately. If appropriate, an appeal can be lodged by the tutor to the Court of First Appeal.

3.0 A student may not repeat the Junior Sophister year more than once, except by special permission of the University Council.

3.1 The final degree award for students who pass the Senior Sophister examination will be comprised of a combination of the Junior Sophister and Senior Sophister marks in a proportion that depends on their particular degree program and outlines in the table below.

<table>
<thead>
<tr>
<th>Moderatorship</th>
<th>% of JS year</th>
<th>% of SS year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemistry</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Chemistry</td>
<td>35%</td>
<td>65%</td>
</tr>
<tr>
<td>Environmental Sciences</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Functional Biology</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Genetics</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Geography</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Geology</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Immunology</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Microbiology</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Molecular Modelling</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Neuroscience</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Physics</td>
<td>35%</td>
<td>65%</td>
</tr>
<tr>
<td>Physics and Astrophysics</td>
<td>35%</td>
<td>65%</td>
</tr>
<tr>
<td>Physiology</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Plant Sciences</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Zoology</td>
<td>20%</td>
<td>80%</td>
</tr>
</tbody>
</table>
GENERAL INFORMATION

Health and Safety

Most practical classes for Junior Sophister Zoology are held in BIOLAB1, 2 or 3 in the Biology Teaching Centre. Practical work for ZO3003, using the Zoological Collections, is carried out in the Zoology Museum, while some of the ZO3040 practicals are held in the Zoology Wet Lab.

Fire drills are held regularly, and specific safety issues relating to the teaching laboratories will be explained to you when you start practical work. You should familiarise yourself with the general rules set out in the Health and Safety Code of Practice booklet which you have already been given. Students have a legal duty under the Safety, Health and Welfare at Work Act, 1989, to act responsibly so as not to endanger others.

Note: Field trips involve physical activity outdoors. Students MUST be aware of the risk and follow instructions on safety.

Illness/Disability

Students with a medical condition or disability that is likely to impair their performance in courses or examinations (e.g. asthma, dyslexia, etc.) are encouraged to inform the Zoology Moderatorship Coordinator, in confidence. Please be aware of, and use where necessary, the various student support services in College (http://www.tcd.ie/Senior_Tutor/links/). Medical certificates, LENS reports, etc. should be lodged, at the time of issue, with your Tutor, and copies submitted to the Executive Officer in the Zoology Department Office as appropriate.

The Zoological Society

A number of societies run by students, and affiliated to the Central Societies Committee, cover interests relevant to students in Zoology. The most important of these is the Dublin University Zoological Society.

ZOOSOC (www.trinitysocieties.ie/society/104/zoological-society) was founded in 1974 and promotes an awareness of all aspects of zoology and natural history. It holds regular meetings and field trips, and its members have participated in numerous wildlife surveys and fundraising campaigns.


# Staff Contacts

## DEPARTMENT OF ZOOLOGY

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Email</th>
<th>Room</th>
<th>Phone (896-)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1366</td>
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</tr>
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<td>1356</td>
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<td>1096</td>
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<td>1.4A</td>
<td>2728</td>
</tr>
<tr>
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<td>0.2</td>
<td>1135</td>
</tr>
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<td>1.7</td>
<td>1063</td>
</tr>
<tr>
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<td>2.7A</td>
<td>3780</td>
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<tr>
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<td>0.2</td>
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<tr>
<td>Dr John ROCFORD</td>
<td>Associate Professor Zoology Course Coordinator</td>
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<td>0.10</td>
<td>2237</td>
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<tr>
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<td>1.4B</td>
<td>1640</td>
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<tr>
<td>Prof. Peter WILSON</td>
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<tr>
<td>Dr Michael WRIE</td>
<td>Assistant Professor</td>
<td><a href="mailto:wriedem@tcd.ie">wriedem@tcd.ie</a></td>
<td>2.7B</td>
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<th>Title</th>
<th>Email</th>
<th>Room</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Ms Alison BOYCE</td>
<td>Senior Technical Officer</td>
<td><a href="mailto:aboyce@tcd.ie">aboyce@tcd.ie</a></td>
<td>B.14</td>
<td>3506</td>
</tr>
<tr>
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<td>B.14</td>
<td>3506</td>
</tr>
<tr>
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<td>Chief Technical Officer 1</td>
<td><a href="mailto:mlinnie@tcd.ie">mlinnie@tcd.ie</a></td>
<td>0.4</td>
<td>1679</td>
</tr>
<tr>
<td>Ms Fiona MOLONEY</td>
<td>Executive Officer</td>
<td><a href="mailto:fimolony@tcd.ie">fimolony@tcd.ie</a></td>
<td>0.16</td>
<td>1366</td>
</tr>
<tr>
<td>Mr Peter STAFFORD</td>
<td>Chief Technical Officer (Specialist)</td>
<td><a href="mailto:pstfford@tcd.ie">pstfford@tcd.ie</a></td>
<td>B.13</td>
<td>2364</td>
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</table>

## SCHOOL OF NATURAL SCIENCES

<table>
<thead>
<tr>
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<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Prof. Fraser MITCHELL</td>
<td>Head of School</td>
<td>fraser.mitchell</td>
<td>Luce Hall*</td>
<td>2920</td>
</tr>
<tr>
<td>Dr Mark HENNESSY</td>
<td>Director of Teaching and Learning (Undergraduate)</td>
<td>mark.hennessey</td>
<td></td>
<td>1881</td>
</tr>
<tr>
<td>Ms Mary FOODY</td>
<td>School Administrator</td>
<td><a href="mailto:schnatsc@tcd.ie">schnatsc@tcd.ie</a></td>
<td>Luce Hall*</td>
<td>2920</td>
</tr>
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<td>0.16C</td>
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<tr>
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<td>Prof. Natalie COOPER</td>
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<tr>
<td>Prof. Ian DONOHUE</td>
<td>Assistant Professor</td>
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<td>Prof. Celia HOLLAND</td>
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<tr>
<td>Prof. Andrew JACKSON</td>
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<tr>
<td>Prof. Frank JEAL</td>
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<tr>
<td>Prof. Paula MURPHY</td>
<td>Associate Professor Functional Biology Course Coordinator</td>
<td>pmurphy3</td>
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<tr>
<td>Dr Conor NOLAN</td>
<td>Research Associate</td>
<td><a href="mailto:nolanc@bim.ie">nolanc@bim.ie</a></td>
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</tr>
<tr>
<td>Prof. John ROCHFORD</td>
<td>Associate Professor Zoology Course Coordinator</td>
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<tr>
<td>Prof. James WILSON</td>
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<td>jwilson</td>
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<tr>
<td>Prof. Peter WILSON</td>
<td>Adjunct Professor</td>
<td><a href="mailto:pwil@eircom.net">pwil@eircom.net</a></td>
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</tr>
<tr>
<td>Prof. Michael WRIDE</td>
<td>Assistant Professor</td>
<td>wridem</td>
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<tr>
<td>Ms Alison BOYCE</td>
<td>Senior Technical Officer</td>
<td>aboyce</td>
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<tr>
<td>Mr Richard HOLLINSHEAD</td>
<td>Senior Technical Officer</td>
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<tr>
<td>Dr Martyn LINNIE</td>
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<tr>
<td>Ms Fiona MOLONEY</td>
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<tr>
<td>Mr Peter STAFFORD</td>
<td>Chief Technical Officer (Specialist)</td>
<td>pstfford</td>
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**SCHOOL OF NATURAL SCIENCES**

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Position</th>
<th>Email/Username</th>
<th>Location</th>
<th>Telephone</th>
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<tbody>
<tr>
<td>Prof. Fraser MITCHELL</td>
<td>Head of School</td>
<td>fraser.mitchell</td>
<td>Luce Hall*</td>
<td>2920</td>
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<tr>
<td>Prof. Mark HENNESSY</td>
<td>Director of Teaching and Learning (Undergraduate)</td>
<td>mark.hennessey</td>
<td>1881</td>
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<tr>
<td>Ms Mary FOODY</td>
<td>School Administrator</td>
<td>schnatsc</td>
<td>Luce Hall*</td>
<td>2920</td>
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* School Office relocating in Michaelmas Term 2014
**Junior Sophister Timetable 2014-15**

Students are advised to check the Notice Board in the Zoology hallway at the beginning of each term for any changes to this timetable.

<table>
<thead>
<tr>
<th>MODULE</th>
<th>LECT</th>
<th>TIME</th>
<th>VENUE</th>
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<tbody>
<tr>
<td><strong>SEMESTER 1 – PART 1</strong></td>
<td></td>
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<tr>
<td><strong>CORE MODULES</strong></td>
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<td><strong>ZO3000 (Part 1)</strong></td>
<td>JW/FJ</td>
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<td>Marine Biology Field Course</td>
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<td>M15*</td>
<td>AUKRM: ZOOL</td>
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<td></td>
<td></td>
<td>Tu11, 14, 16</td>
<td>AUKRM: ZOOL</td>
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<td></td>
<td></td>
<td>Th10-13</td>
<td>BIOLAB3/MUSEUM</td>
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<tr>
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<td>Th15</td>
<td>AUKRM: ZOOL</td>
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<tr>
<td><strong>ZO3003</strong></td>
<td>ID/FJ</td>
<td>M14 (wks 6-7)</td>
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<td>M16 (wk 8)</td>
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<td>Tu12 (wks 6, 10)</td>
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<td>Tu12 (wks 7, 9)</td>
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<td>W14-17</td>
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<td><strong>ZO3050</strong></td>
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<td><strong>BO3105</strong></td>
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<td>Fundamentals of Ecology</td>
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<td>M10, 12*</td>
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<td></td>
<td>W10-13</td>
<td>BIOLAB3: EE5</td>
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<td>Th14, 16</td>
<td>GLT: MUSB</td>
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* Monday of week 10 is a Public Holiday - no classes will run on this day.

| **SEMESTER 1 – PART 2** |      |              |                        |
| **CORE MODULES**        |      |              |                        |
| **ZO3000 (Part 2)**     | FJ   | W12          | AUKRM: ZOOL            |
| Marine Biology          |      | Th12         | AUKRM: ZOOL            |
| **ZO3003**              | FJ   | M16          | AUKRM: ZOOL            |
| Animal Diversity        |      | Tu10         | AUKRM: ZOOL            |
|                         |      | W10, 11      | AUKRM: ZOOL            |
|                         |      | Th12         | AUKRM: ZOOL            |
|                         |      | F10          | AUKRM: ZOOL            |
|                         |      | F11-13       | AUKRM: ZOOL            |
| **ZO3040**              | MW/PW| M12          | BOTLT 13: BTNY         |
| Comparative Physiology  |      | M15          | BOTLT 13: BTNY         |
|                         |      | Tu12         | WETLAB: ZOOL           |
|                         |      | W14-17       | BOTLT 13: BTNY         |
|                         |      | F9           | BOTLT 13: BTNY         |
## SEMESTER 2 – PART 1  
(Weeks 21-25 of Hilary Term)

<table>
<thead>
<tr>
<th>CORE MODULES</th>
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<tr>
<td><strong>ZO3020</strong> Behavioural Ecology</td>
<td>NM</td>
<td>M10 Tu10 Tu14-17 W11 F10</td>
<td>AUKRM: ZOOL AUKRM: ZOOL BIOLAB2: EE4/5 AUKRM: ZOOL</td>
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<td>CH</td>
<td>W10, W14 Th10 Th14-17</td>
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<tr>
<td><strong>ZO3070</strong> Experimental Design and Analysis</td>
<td>CH</td>
<td>M9 W12 F11-13</td>
<td>BOTLT 13: BTNY BOTLT 13: BTNY TBA</td>
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<td><strong>ZO3085</strong> (Part 1) Wildlife Biology</td>
<td>JR</td>
<td>Tu9 Th9 F9</td>
<td>AUKRM: ZOOL AUKRM: ZOOL AUKRM: ZOOL</td>
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## SEMESTER 2 – PART 2  
(Weeks 28-32 of Hilary Term)

<table>
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<tr>
<td><strong>ZO3070</strong> Experimental Design and Analysis</td>
<td>CH</td>
<td>M10 Tu9 F11-13</td>
<td>BOTLT 13: BTNY BOTLT 13: BTNY TBA</td>
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<td><strong>BO3122</strong> Entomology</td>
<td>JS</td>
<td>M14-17 W9 Th9 Th14-17</td>
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<tr>
<td><strong>ZO3085</strong> (Part 2) Terrestrial Ecology Field Course</td>
<td>JR/NM</td>
<td>Week 33 (06.04.15 – 11.04.15) Residential – Glendalough, Co Wicklow</td>
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* Tuesday of week 30 and Friday of week 32 are Public Holidays.*
Some Important Dates in 2014-15

Michaelmas Term begins 22.09.14
Marine Biology Field Course (part of ZO3000) 22.09.14 – 26.09.14
**Semester 1, Part 1** lectures begin 329.09.14
Study Week - no lectures 03.11.14 – 07.11.14
**Semester 1, Part 2** lectures begin 10.11.14
Michaelmas Term ends 12.12.14

2014

Hilary Term begins 12.01.15
**Semester 2, Part 1** begins 12.01.15
Assessment Week *(Week 10)* 16.02.15 – 20.02.15
Study Week - no lectures 23.02.15 – 27.02.15
**Semester 2, Part 2** lectures begin 02.03.15
Hilary Term ends 03.04.15
Terrestrial Ecology Field Course (part of ZO3085) 06.04.14 – 11.04.15
JS Zoology Written Examinations Begin 27.04.15