Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Department of Zoology

Zoology Senior Sophister Handbook 2022–2023

Contents

WELCOME 4

THE PROGRAMME 5
Programme Structure and Learning Outcomes 5
European Credit Transfer System ECTS 6
Staff Contacts 7
Summary of the Senior Sophister Programme 8
Brief Description of Senioer Sophister Modules 9

Zoology Regulations 19
Assessment and Awards 19
Continuous ('in-course') Assessment (CA) 20
Attendance 21
Access to Scripts 21
Plagiarism 21
Appeals Policy 22
Grading Guidelines 23
Prizes in Zoology 28

GENERAL INFORMATION 29
Work Stations 29
Health and Safety 29
Emergency Procedures 29
Data Protection 30
Student Support 30
Students' Union 30
Illness/Disability 30
Co-curricular Activies 31
Absence from College 31
Research Ethics 32
The Zoological Society 33

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. Alternative formats of the Handbook can be made on request.

The information provided in this handbook is accurate at time of preparation. Any necessary revisions will be notified to students via email, blackboard 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 University Calendar and information contained in programme or local handbooks, the provisions of the General Regulations in the Calendar 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 provide solutions to global challenges to the environment, health and human wellbeing.

The general philosophy behind the Senior Sophister year is to equip and encourage you to develop independence of thought and learning practices. You will develop the skills to enable you to succeed in your future employment or advance to further formal study and, crucially, equip you for the life-long learning which is essential for adapting to new information, work practices and cultures.

You capstone project will allow you to specialise in areas that most interest and inspire you, complemented by modules available across a wide range of systems and levels of organization from the sub-cellular to the landscape level. You will undertake an independent research project and attend seminars at the cutting edge of international research through our seminar series. We hope that the deep knowledge you will gain of your modules and research topics will provide you with a solid scientific framework from which to think creatively and explore the natural world and its interactions with human society.

Paula Murphy
Head of Zoology

A Word from the Zoology Moderatorship Director

Welcome to your Senior Sophister year in Zoology. This is what the last three years have been all about – you are now on the threshold of graduation as a Zoologist. The coming year will be a lot of hard work but also, we hope, fun. The programme is intensive and there are numerous submission and presentation deadlines that must be met.

With almost 50% of the credits going for continuous assessment (depending on module selection), 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, attend the regular meetings with your project supervisor and, if you have any problems or issues with any part of the programme, speak with the lecturer concerned or call in to see me in my office.

Nessa O'Connor
Zoology Moderatorship Director

Overview

Senior Sophister students in Zoology follow a programme that builds deep knowledge in specific subjects through a series of optional tutorial-style modules and core modules that build key and transferable skills.

Programme Structure

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 Trinity. With a breadth of skills, challenges and responsibilities, we are confident that everyone of the Trinity Graduate Attributes are met by the zoology sophister programme: https://www.tcd.ie/TEP/graduateattributes.php

Learning Outcomes

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 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.

ECTS Weighting

The European Credit Transfer System (ECTS) is an academic credit system based on the estimated student workload required to achieve the objectives of a module or programme of study. It is designed to enable academic recognition for periods of study, to facilitate student mobility and credit accumulation and transfer. The ECTS is the recommended credit system for higher education in Ireland and across the European Higher Education Area.

The ECTS weighting for a 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, clinical attendance, professional training placements, and so on as appropriate. There is no intrinsic relationship between the credit volume of a module and its level of difficulty.

The European norm for full-time study over one academic year is 60 credits. 1 credit represents 20-25 hours estimated student input, so a 10-credit module will be designed to require 200-250 hours of student input including class contact time, assessments and examinations.

ECTS credits are awarded to a student upon successful completion of the programme year. Progression from one year to the next is determined by the programme regulations. Students who fail a year of their programme will not obtain credit for that year even if they have passed certain components. Exceptions to this rule are one-year visiting students, who are awarded credit for individual modules successfully completed.
Senior Sophister students in Zoology take 35 credits of 'Core' Modules, which include the Capstone project (20 credits), Data Handling (5 credits), Research Comprehension (5 credits) and General Zoology (5 credits). In addition, this year six 'Open' modules are available. Although some modules are not running this year, we are introducing a new module, Coastal Nutrient Dynamics, which will be offered to 7 Zoology students based on their performance in the JS Marine Biology module. Places in this new module are capped and thus will be offered to the highest ranked students first till the module is full. Other modules include Conservation and Wildlife Management (5 credits), Advances in Behavioural Ecology (5 credits), Environmental Impact Assessment (5 credits), Restoration Ecology and Re-wilding (5 credits) and Evolution of Plants and Plant-Atmosphere Interaction (5 credits).

Contacts:

		Email (@tcd.ie)
Dr Nessa O'Connor	Associate Professor & Zoology Moderatorship Director	n.oconnor
Prof. Yvonne Buckley	Chair of Zoology	buckleyy
Dr Andrew Jackson	Associate Professor	jacksoan
Dr Jacinta Kong	Research and Teaching Fellow	kongj
Dr Pepijn Luijckx	Assistant Professor	luijckxp
Prof. Nicola Marples	Professor	nmarples
Prof. Paula Murphy	Professor & Head of Zoologyg	pmurphy3
Dr Conor Nolan	Visiting Research Fellow	cpnolan
Dr Marcin Penk	Teaching Fellow	penkm
Dr Jay Piggott	Assistant Professor	piggottjj
Dr Nick Payne	Assistant Professor	paynen
Dr Carlos Rocha	Associate Professor	rochac
Dr Rebecca Rolfe	Assistant Professor	rolfera
Dr John Rochford	Adjunct Associate Professor	rchfordj
Prof. James Wilson	Adjunct Professor	jwilson

Ms Alison Boyce	Senior Technical Officer & Zoology Safety Officer	aboyce zoosafe
Ms Sinead Kelly	Senior Technical Officer	kellys76
Dr Martyn Linnie	Chief Technical Officer	mlinnie
Ms Fiona Moloney	Senior Executive Officer	fimolony

Prof. Ian Donohue	Professor & Head of School	donohui snshos
TBC	Director of Teaching and Learning (Undergraduate)	

Summary of the Senior Sophister Programme

Module Structure

Zoology	
Semester 1 (S1)	**Semester 2 (S2)**
Core Modules (5 credits each)	
ZOU44030: Data Handling	ZOU44020: General Zoology
ZOU44060: Research Comprehension	
Open Modules (5 credits each)	**Capstone Project (20 credits)**
ZOU44013: Conservation and Wildlife Management ZOU44019: Advances in Behavioural Ecology ZOU44092: Environmental Impact Assessment BOU44111: Restoration Ecology and Re-Wilding BOU44110: Evolution of Plants and Plant Atmosphere-Interaction GLU: 44013 Coastal Nutrient Dynamics*	FBU44000: Research Project

*Entry to this module is capped see notes in text above.

Brief Description of Senior Sophister Modules

Further details will be provided by the module coordinator at the start of each module, including due-dates for assignments, schedules for lectures, tutorials, practicals and details of individual and group work.

CORE MODULES:

ZOU44030 Data Handling

(5 credits – Semester 1)

Module Personnel:

Dr Andrew Jackson, Prof. Yvonne Buckley

Module Content:

Being able to form research questions and challenge our hypotheses by collecting and analysing data forms the basis of scientific inquiry. An understanding of data analysis is an essential skill set for all scientists. This module will consist of 2 tutorial sessions per week spanning all of semester 1. One of the tutorials each week will be used to develop class-directed questions relevant to current scientific thinking. As a class, we will form hypotheses, collect data and develop appropriate analytical techniques to answer our research questions. Concurrently, online material including video podcasts will be used to develop hands-on skills in the use of the very powerful and flexible statistics package R for data analysis. The module will start with basic probability theory, introduce different statistical distributions and culminate in learning how General Linear Models form a common framework for conceptualizing and analyzing your data. At the end of the module you will have analysed a wide variety of data types and will have used the transferable and widely applicable statistics package R to analyse your data.

Learning Outcomes:

On successful completion of this module, students will be able to:

1. Summarise and communicate quantitative results graphically and textually to scientific standards.
2. Apply appropriate statistical analyses of commonly encountered data types.
3. Explain the context of the analyses within a hypothesis driven framework of scientific logic.
4. Use the R statistical computing language for data analysis.
5. Create R notebooks for documenting analyses and sharing with collaborators.

Assessment Details:

This module is assessed 35% by continuous assessment and 65% by questions on an annual examination paper.

ZOU44060 Research Comprehension

(5 credits – Semester 1 & 2)

Module Personnel:

Dr Nicholas Payne

Module structure:

No matter what you do when you graduate, in most jobs you will be expected to read, understand and interpret data. Often this will be in a subject you are unfamiliar with, or will use unfamiliar methods or study organisms. The aim of this module is to help you to develop the ability to understand and interpret research from a broad range of scientific areas, and then to develop opinions about this research and how it fits into the "big picture". This module also aims to improve your ability to communicate all kinds of scientific research to a general audience, a skill that is currently in great demand.

Learning Outcomes:

1. Comprehend and report on scientific studies presented both orally and in primary literature.
2. Identify the aims and/or hypotheses in scientific studies and analyse the research methods employed to address them.
3. Interpret and generalise the results of the studies in the context of the wider subject area.
4. Assess and evaluate the conclusions of the scientific study.
5. Interpret graphical, tabular and pictorial representations of data and infer results in the context of the subject matter.
6. Summarise scientific studies in language and style suitable for consumption by a wide audience in an online form.

Assessment Component Breakdown

40% CA, 60% Written Exam. **CA:** A blog post**:** A blog post will be written on the content of the seminars. **Exam:** A series of questions on one or more unseen scientific papers (or parts of these papers) related to the seminar series that will test interpretation of scientific data, insight and critical thinking.

2 hours end of year written exam.

Assessment for this module will take place entirely in Semester 2.

ZOU44020 General Zoology

(5 credits – Semester 2)

Module Personnel:

Dr Nicola Marples, All Zoology Staff

Module Content:

This module provides an opportunity for students to revise and study, in greater depth, topics from the Junior Sophister Zoology programme. Students are expected to integrate their approach to this earlier material with the perspectives and skills they develop during their Senior Sophister year. Topical zoological advancements and the wider subject of Zoology will be discussed. This dynamic module will be student-driven toward their interests.

Learning Outcomes:

On successful completion of this module, students will be able to:

1. Describe the diversity and evolution of the animal kingdom.
2. Recognise, on the basis of diagnostic features, representatives of the major taxa of invertebrates and vertebrates.
3. Explain important basic concepts and current developments in such key areas of animal biology as ecology, comparative physiology, behaviour and evolution.
4. State confidently the theoretical and practical aspects relating to essential laboratory and field technique.

Assessment Details:

This module is examined in a three-hour lab-based short answer paper at the end of the final semester.

FBU44000 Research Project

(20 credits –Semester 2)

Module Personnel:

TBC, and all Zoology & Botany Staff

Module Content

The project provides an important opportunity for students to plan and carry out a detailed and original piece of scientific research and communicate the results. It culminates in the production of a thesis and communication of the results through a poster presentation at an undergraduate research conference. Students will be assigned to a member of staff who will support an appropriate topic and will supervise the work. They will submit a research proposal before the practical work begins as part of the Junior Sophister ZOU33070 Experimental Design & Analysis module. As part of FBU44000 they will submit a thesis and present a poster on the results. For the project, they will be expected to outline clearly a scientific problem, review the associated literature, design and execute an appropriate research programme, analyse and present the results and draw clear conclusions and record progress in a notebook (physical or electronic as appropriate). Detailed guidance notes on writing and submitting the thesis and poster may be found on the FBU44000 Blackboard site.

Learning Outcomes:

On successful completion of this module, students will be able to:

1. Formulate scientific questions, apply a scientific approach to problem solving.
2. Plan an investigation and utilise the principles of good experimental, observational or computational design.
3. Conduct an in-depth scientific review of a subject.
4. Organise desktop, computational, field- or laboratory-based research including: logistics, recording, archiving, qualitative or numerical analysis and presentation and interpretation of data.
5. Manage a project through continuous assessment of progress and improvement of skills.
6. Effectively work with a team including their supervisor and other members of the research team.
7. Demonstrate technical competence in the handling of research facilities and operate safely in a computational, laboratory and/or field environment, both individually and as part of a team.
8. Present and communicate results in the form of a dissertation and poster presentation.

Assessment Details:

Continuous assessment: Thesis (18 ECTS credits), poster presentation (2 ECTS credits).

OPEN MODULES

ZOU44013 Conservation and Wildlife Management

(5 credits – Semester 1)

Module Personnel:
Dr John Rochford

Module Content:
This module, which consists of both lectures and tutorials, looks at some of the practical applications of wildlife biology to the conservation and management of animals, both *in-* and *ex-situ*, including the role of zoos in captive breeding programmes. Among the topics covered are: planning for wildlife management, the principles of managing wildlife for sustainable harvest or control, management of scarce or endangered species, practical issues associated with the *ex-situ* management of species, and the design and management of conservation areas. In the second part of the module, we will concentrate on anthropogenic impacts on biodiversity conservation, including the development and implementation of biodiversity conservation strategies in the wake of the Convention on Biological Diversity, other national and international wildlife legislation, biosecurity and the role of Invasive Alien Species, Biological Data Management and the development of Species Action Plans, and the role of reintroductions in biodiversity conservation.

Learning Outcomes:
On successful completion of this elective, the student will be able to:
1. Outline the goals and history of sustainable wildlife management.
2. Determine and evaluate strategies for exploitation and control of animal resources
3. implement techniques for establishing and maintaining the conservation status of species.
4. Describe the relationship between *in-* and *ex-situ* conservation measures.
5. Evaluate the selection, design and management of protected areas for wildlife.

Recommended Reading List:
Primack, Richard B. 2010. Essentials of Conservation Biology (5th edition).
Publisher – Sinauer Associates, Sunderland, Mass. (ISBN 9780878936403)
Groom, Martha J., Meffe, G.K. and Carroll, C.R. 2006. Principles of Conservation Biology (3rd edition). Publisher – Sinauer Associates, Sunderland, Mass. (ISBN 0878935185)

Assessment Details:
This module is assessed 50% by continuous assessment and 50% by questions on an annual examination paper.

ZOU44019 Advances in Behavioural Ecology

(5 credits – Semester 1)

Module Personnel:

Dr Nicola Marples

Module Content:

This module will expand the students' grasp of some classic topics in the field of behavioural ecology such as the consequences of group living, optimality models, animal culture and signaling. We will also explore some currently advancing themes, including multi-level societies, co-operation, and the effects of urbanization on animal behaviour. The content will be delivered using a fully flipped classroom format of worksheets leading to recorded lectures and independent reading followed by structured discussions. The continuous assessment will be in two parts. The first will involve the students undertaking group research into the evidence for empathy in animals and presenting their findings to the class, receiving a group mark. The second will involve writing a blog on a paper of their choice taken from one of the leading behavioural journals, which will be individually assessed.

Learning Outcomes:

On successful completion of this elective, the student will be able to:

1. Discuss the foundations of modern behavioural ecology supported by appropriate experimental examples.
2. Appreciate the uses of theoretical modelling and sound experimental design in the study of animal behaviour.
3. Present reasoned arguments on a wide range of currently developing topics, based on the literature and their own conclusions.
4. Have experience of reading, summarising and presenting primary literature to the class.
5. Work in a group to support each other's learning and understanding.
6. Have experience of writing a blog suitable for presentation of scientific ideas to social media audiences.

Assessment Details:

This module is assessed 50% by continuous assessment and 50% by essay questions on an annual examination paper.

ZOU44092 Environmental Impact Assessment

(5 credits – Semester 1)

Module Personnel:

Dr John Rochford

Module Content:

This module involves an introduction to the principles and processes of Environmental Impact Assessment, particularly in relation to national and international requirements. All stages of the EIA process, from initial project screening to the final review, are covered, with the emphasis throughout on the role of the natural scientist. Strategic Environmental Assessment and Appropriate Assessment are also covered. In addition to the lectures, students carry out a group scoping exercise for a proposed development and conduct a quality review of an actual EIAR.

Learning Outcomes:

On successful completion of this module students will be able to:

1. Outline the development of the Environmental Impact Assessment process as a management and legislative tool from its inception in the 1960s to its present form.
2. Explain the stages in the process from initial screening to post-project monitoring and auditing.
3. Conduct a scoping exercise for a project and produce a draft Scoping Statement.
4. Critically evaluate Environmental Impact Assessment Reports prepared for a wide range of projects.
5. Compare and contrast the process of Environmental Impact Assessment with Strategic Environmental Assessment.
6. Describe Appropriate Assessment in the context of Natura 2000 sites.

Assessment Details:

This module is assessed 50% by continuous assessment and 50% by questions on an annual examination paper.

BOU44110: The Evolution of Plants and Plant-Atmosphere Interaction

(5 credits – Semester 1)

Module Personnel:

Prof. Jennifer McElwain

Module Content:

We are currently experiencing major changes in our climatic and atmospheric environment. Conservative estimates that the concentration of greenhouse gas carbon dioxide will double by the end of this century and global temperatures are expected to rise by 1 to 4 degrees C. A major issue facing the scientific and political community is understanding how these projected changes will influence natural ecosystems, plant and animal ecology and biodiversity. This module will explore the evolution of plants in the context of long-term changes in climate and atmospheric composition. Examples of plant-atmosphere and plant-climate interactions in the deep geological past will be examined in addition to modern experimental studies. The course will provide a framework for understanding the nature and scale of evolution, adaptation and ecophysiological responses of plants to their atmospheric and climatic environment over the past 500 million years of Earth history. Continual assessment will be through a programme of tutorials and student reviews of primary research papers linked to lectures:

Learning Outcomes:

On successful completion of this module students should be able to:

1. Describe plant evolution over the past 3,700 million years (with specific emphasis on land plant evolution over the past 500 million years based on the fossil plant record).
2. Evaluate fossil plant responses to environmental extremes associated with mass extinction events in Earth history.
3. Describe how plant evolution influences the long-term carbon cycle, climate and atmospheric composition.
4. Understand global, regional, local and individual level plant responses to past changes in climate and atmospheric composition.
5. Use knowledge of plant-atmosphere responses in the deep geological past to evaluate the threat of ongoing anthropogenic global change.

Assessment Details:

This module is assessed 30% by continuous assessment and 70% by questions on an annual examination paper.

BOU44111 Restoration Ecology & Re-wilding

(5 credits – Semester 1)

Module Personnel:

Dr Marcus Collier

Module Content:

Restoration ecology, like conservation biology, is a 'crisis' discipline, having emerged as a science/practice response to the social and ecological impacts directly and indirectly driven by human activities. Restoration ecology has proven to be highly effective in some cases but has also given rise to some controversy as well as policy difficulties. Rewilding and novel ecosystems are new and controversial areas within restoration ecology making it difficult to know how and when to intervene. This module will introduce you to the challenges and opportunities, failings and fallacies of the complex world of restoration ecology, rewilding, and the work of restoration ecologists. It will look at how rewilding could be the most efficient of nature-based solutions and asks if this is feasible in the modern world. As the discipline struggles to navigate global climate issues, integrate with the social sciences, incorporate politics and economics, and derive policy actions, this module will draw on case studies of restoration globally and will challenge students to rethink ecology and ecosystems in the Anthropocene.It will also discuss areas of employment where students might consider after graduation, with some invited guests providing insight into the practice of restoration and rewilding.

Learning Outcomes:

On successful completion of this elective, the student will be able to:

1. Understand the principals of restoration ecology and rewilding as they apply in a modern context
2. Comprehend the nuanced nature of restoring ecosystems and habitats as well as re-introducing species in practice
3. Carry out restoration case study analysis for their assignments
4. Understand the complex relationship between ecology, social values and policies
5. Evaluate the success of restored ecosystems and species

Assessment Details:

This module is assessed 50% by continuous assessment and 50% by questions on an annual examination paper.

Recommended Reading:

Aronson, J, Milton, S.J., & Blignaut, J. Eds. (2007) *Restoring Natural Capital*. Island Press

Hobbs, R. J., Higgs, E. S. & Hall, C. M. Eds. (2013) *Novel Ecosystems*. Wiley

Marris, E. (2011) *Rambunctious Garden*. Bloomsbury

Monbiot, G. (2015) *Feral*. Penguin

GLU44013 Coastal Nutrient Dynamics

(5 credits – Semester 1)

Module Personnel:

Dr Carlos Rocha

Module Content:

This course provides a practical understanding of the natural biogeochemical processes in coastal zones and the anthropogenic stressors that interact with them to affect coastal ecosystem function. The module is designed to deliver a real-life laboratory and field work environment and includes a residential fieldtrip. Students prepare to answer a research question linked to the nutrient dynamics of a selected coastal system, in Ireland. Module develops in three stages: 1) A preparation stage in Dublin, where the system is scoped and introductory briefs to establish a research aim are prepared; research objectives are set and translated into tasks; a field campaign is prepared; analytical methods and experiments relevant to the field campaign are learnt and tested; 2) **A field campaign**[1] (4-6 days, during reading week), when students work autonomously to sample water and sediments, analyse water for environmental tracers and conduct experiments to quantify processes affecting nutrient fluxes, collating the data for processing and interpretation; 3) A return phase in Dublin, where lab work is completed, results of the fieldwork campaign are discussed and presented as a written report.

Learning Outcomes:

On successful completion of this elective, the student will be able to:

1. Plan and execute a field campaign to answer research questions on nutrient dynamics in coastal zones.
2. Prepare and test analytical and experimental methods to employ during field monitoring campaigns.
3. Collect and analyse water and sediment samples using standard operational procedures.
4. Integrate published data with analytical and experimental results to establish the trophic state of coastal ecosystems.
5. Present campaign results and write coastal water quality status reports

Assessment Details:

This module is assessed 100% by continuous assessment.

Recommended Reading:

No core text is required.

A list of targeted readings will be made available on Blackboard.

Zoology Regulations

Assessments and Award

The assessment value is based on the ECTS credit value of the modules concerned. Your performance will be assessed by Continuous Assessment and Written Examination and an interview (*Viva voce*) may be requested by the external examiner. In person exams may be replaced by online alternatives if public health conditions deteriorate whereupon HSE guidelines will be adhered to (e.g. COVID-19 restrictions).

Module Code	Module Name	ECTS Credits	EX	CA
CORE MODULE				
FBU44000	Research Project (Thesis and Presentation)	20		100%
ZOU44020	General Zoology	5		100%
ZOU44030	Data Handling	5	65%	35%
ZOU44060	Research Comprehension	5	60%	40%
OPEN MODULES				
ZOU44013	Conservation and Wildlife Management	5	50%	50%
ZOU44019	Advances in Behavioural Ecology	5	50%	50%
ZOU44092	Environmental Impact Assessment	5	50%	50%
BOU44110	Evolution of Plants and Plant-Atmosphere Interaction	5	70%	30%
BOU44111	Restoration Ecology & Re-wilding	5	50%	50%
GLU44013	Coastal Nutrient Dynamics	5		100%

Continuous ('in-course') Assessment (CA)

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.
- Module assessments are designed to meet the learning outcomes of the module. As such, ***all*** components of Continuous Assessment (CA) must be submitted for assessment unless with prior agreement with the module coordinator. This is essential because missing CA work is recorded automatically with a code indicating "AB – absent without permission" and the grades for that modules are withheld meaning progression to the next year or graduation, in the case of Senior Sophister, is not applied.
- An important learning outcome of all university courses is the development of time management skills. This is formalised in our modules by stressing the importance of time-keeping with regard to assignments. Work submitted after the due date will have marks deducted unless good cause (e.g. medical certificate) is provided. A general policy is a deduction of 5% of the marks, per day, up to a maximum of one week after the due date at which point the assessment will receive zero marks. Modules may specify their own policy on deductions as appropriate for the various forms of assessments specific to the module: in these cases, module coordinators will communicate the details to you at the start of the module.
- Assessment marks and feedback may be obtained from the Teaching Office or directly via Blackboard approximately three weeks after the submission date. In some circumstances feedback may not be made available till all students have submitted their assessments.

The assessment for ZOU44020 (General Zoology) is a 3 hour paper (a short-answer 'spot-test' paper). All other examinations are typically 1.5 to 2 hours long. Further information about the form of the examination papers will be provided as part of the introduction to each module.

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

Past examination papers can be viewed at:
https://www.tcd.ie/academicregistry/exams/past-papers/annual/

Honours degrees in College are governed by a Court of Examiners that includes an external examiner who is a senior academic in a comparable institution. During the ratification of the zoology examination procedures the external examiner will call a selection of students for a *viva voce* examination (oral examination) that lasts typically 10 – 20 minutes. Students also have the right to request a *viva voce* exam. While attendance at this examination is not mandatory, it is recommended that you make yourself available and attend if called. The exact dates and times for these examinations will not be known until closer to the time when the court of examiners meeting is scheduled but it is likely to be the last week of the marking results period as per the University's published academic year structure.

Attendance

Attendance at all lectures, tutorials and practical sessions is compulsory for Senior 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 – see the section below on Absences from 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.

Access to Exam Scripts *(Freedom of Information Act)*

Following publication of the final examination results, students may have access to their examination scripts upon written application to the Zoology / Botany / Environmental Sciences teaching office or Course Coordinator.

Plagiarism

Plagiarism is **academic fraud** and, as such, is an offence against University discipline. The University considers plagiarism to be a **major** offence, and subject to the disciplinary procedures of the University.

In order to support students in understanding what plagiarism is and how they can avoid it, an **online central repository**, to consolidate all information and resources on plagiarism, has been set up and can be accessed at
http://tcd-ie.libguides.com/plagiarism

Appeals Policy

Trinity College Dublin, the University of Dublin, herein referred to as Trinity, recognises that in the context of its examination and assessment procedures, a student may wish to appeal a decision made in relation to their academic progress. The appeals procedure may be used only when there are eligible grounds for doing so and may not be used simply because a student is dissatisfied with the outcome of a decision concerning their academic progress. Further information can be accessed at: https://www.tcd.ie/teaching-learning/academic-affairs/ug-regulations/appeals.php

Grading Guidelines

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

Class	Mark Range	Criteria
I	90-100	**EXCEPTIONAL ANSWER;** 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.
	80-89	**OUTSTANDING ANSWER;** 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.
	70-79	**INSIGHTFUL ANSWER;** showing a grasp of the full relevance of all module 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.
II-1	65-69	**VERY COMPREHENSIVE ANSWER;** good understanding of concepts supported by broad knowledge of subject. Notable for independent synthesis of information rather than originality. Evidence of relevant reading outside lecture notes and module work. Mostly accurate and logical with appropriate examples. Occasionally a lapse in detail.

	60-64	**LESS COMPREHENSIVE ANSWER;** mostly confined to good recall of module work. Some independent synthesis of information or ideas. Accurate and logical within a limited scope. Some lapses in detail tolerated. Evidence of reading assigned module literature.
II-2	55-59	**SOUND BUT INCOMPLETE ANSWER;** based on module work 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. The content is sensible and relates a reasonable narrative, if limited in synthesis and sophistication. There is reasonably good citation practice and a well presented reference list in essays.
	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. Content may be disjointed and lacking good structure. Poor citation practice and reference list in essays.
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.
F-1	30-39	**MARGINAL FAIL;** inadequate answer, with no substance or understanding, but with a vague knowledge relevant to the question.
F-2	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.
U.G		Ungraded

The following guidelines are used for Project/Dissertation Assessment in Zoology

Class	Mark Range	Criteria
I	80-100	Exceptional project report showing deep understanding of the topic and literature similar to that expected in a published paper. Clear grasp and expression of the justification for the research, with clear explanation of the importance and implications of the work within the subject area. Methods described with the clarity and detail expected in a published paper, showing sound experimental design. Exceptional presentation, analysis and exploration of results focussed on the question asked, using the most appropriate analyses for the question and data. Thoughtful, critical evaluation of the findings, discussed insightfully in their full context within the literature. Excellent presentation of the finished thesis, which contains very few, if any, editorial errors.
	70-79	Excellent project report showing evidence of wide reading and broad understanding of the topic, with clear presentation, focused and thorough analysis of results and a demonstrated ability to critically evaluate and discuss research findings. Clear indication of insight, originality, and appreciation of the implications of the findings for the research field. An excellent, highly competent and well-presented report overall but falling short of outstanding in at least one aspect.
II-1	65-69	A very good project report, showing a reasonably wide understanding of the topic and its associated literature, with some indication of how the research adds to the field. Methods described clearly and in sufficient detail for someone to repeat the work, and showing sound experimental design, or the appreciation of how it could have been made sound. Competent analysis of the results and valid and accurate interpretation of the findings. Results presented accurately using appropriate figures and/or tables. Accurate appreciation of any shortcomings of the experimental design and the implications for interpretation. Discussion of the results puts them into some level of context but may not reflect all the implications for the research field.

	60-64	A good project report, showing some understanding of the wider topic and its associated literature, with some indication of the relevance of the research. Methods described clearly, though perhaps not in sufficient detail for someone else to repeat the work. Sound experimental design, or some appreciation of how it could have been made sound. Competent analysis of the results, though perhaps through the use of simpler tests than would be ideal. Accurate presentation of results, though perhaps not with the best choice of graphics. Interpretation of findings mostly valid and accurate. Some appreciation of any major shortcomings in experimental design and the implications for interpretation. Discussion may focus mostly on the findings, with only occasional references to other work, though those contextual references should be present.
II-2	50-59	A moderately weak project report which shows some understanding of the research question, but lacks a strong grasp of the wider research topic or the relevance of the project. Methods mostly described clearly, but there may be lapses in detail. Experimental design may not be entirely sound, and any weakness may be undescribed. Analysis of the results generally sound but may be simple and contain errors such as incorrect statistical reporting or the use of less than ideal graphs. Interpretation of the findings may not be entirely accurate, and shortcomings in the design or analysis unlikely to be taken into account during interpretation, but some level of interpretation of the results must be present. Discussion may focus solely on the findings of the work, and may lack references to other work, though some indication of the relevance of the project should be present. Insufficient attention paid to organisation and presentation of the report.
III	40-49	A weak project showing only limited understanding of the research question, reported without understanding of the wider context or relevance of the project. Methods not complete. Experimental design may contain obvious unrecognised flaws and may not be described completely. Analysis of results simple and may show basic errors. Interpretation of results may be limited or absent. Discussion may be minimal and restricted to the direct findings of the project. General standard of presentation poor.

Fail	20-39	An unsatisfactory or incomplete project report, lacking sections or with little content in some. Very limited understanding of the question or failure to express it at all. Methods may be incomplete, possibly lacking description of experimental design. Results may be incomplete, with poor choice of graphics and / or tables. Analysis of data may be lacking or contain fundamental errors. Interpretation of the results likely to be limited or absent. Discussion restricted to a restatement of results. Very poor overall standard of presentation.
	0-19	An extremely poor project report containing very little substance and showing no real understanding or awareness of the problem. No attempt at a relevant literature review or relevant support from published work. Methods chaotic or incomprehensible. Almost absent or completely absent presentation of results. Any analysis of results incorrect or inappropriate. Clear inability to interpret results in relation to other work or ideas. Very poor overall standard of presentation.

Prizes in Zoology

A candidate who has shown exceptional merit at the degree examination may be awarded a ***Gold Medal*** by the Board of College on the nomination of the examiners.

Other College prizes relevant to the Zoology Moderatorship are:

E.A. Collen Prize in Zoology
The prize was founded in 1990 by a bequest from Mrs E.A. Collen. The income from the fund is awarded annually to a student who has completed a Moderatorship in Zoology and has been accepted by Trinity College as a candidate for a higher degree. It is intended to encourage research in Zoology and is awarded on the recommendation of the Head of Discipline. *Value €115 .*

Maureen de Burgh Memorial Prize in Marine Biology
The prize was established in 1986 by subscription in memory of Dr Maureen de Burgh, a former member of the department, to promote research in marine biology. It is awarded annually to a postgraduate or undergraduate student to cover expenses related to research in marine biology at Trinity College, on the recommendation of the Professor of Zoology and one other lecturer in the department. *Value €140.*

W.C. Campbell Moderatorship Prize in Zoology
This prize was established in 2017 by a gift from Professor William C. Campbell from his 2015 Nobel prize in Physiology or Medicine, which was awarded for discoveries concerning a novel therapy against infections caused by roundworm parasites. The gift is a token of gratitude for Prof. Campbell's undergraduate education in the Natural Sciences, and for the inspiring mentorship of Dr. James Desmond Smyth of the Zoology Department. It is awarded annually to a student with the best overall Moderatorship result in Zoology. Value, €200.

W.C. Campbell Undergraduate Research Prize in Zoology
This prize was established in 2017 by a gift from Professor William C. Campbell from his 2015 Nobel prize in Physiology or Medicine, which was awarded for discoveries concerning a novel therapy against infections caused by roundworm parasites. The gift is a token of gratitude for Prof. Campbell's undergraduate education in the Natural Sciences, and for the inspiring mentorship of Dr. James Desmond Smyth of the Zoology Department. It is awarded annually to an undergraduate student with the best overall undergraduate research project result in Zoology. Value, €200.

Andrew Bacon Animal Diversity Award
This award is presented in memory of Andrew Bacon who sadly passed away in 2020 a year after he graduated in Zoology. Andrew contributed in many ways to our department, both as a student and specifically, during his 3rd year, as a mentor on our museum outreach programme. He is very sadly missed by both staff and students. The Andrew Bacon award is presented annually based on student performance in studies relating directly to Animal Diversity in association with the Zoology Museum.

General Information

Work Stations

For your project you may be working in the field, the aquarium or laboratory of your supervisor, in association with a number of postgraduates. Tutorials are generally held in the Auk Room in the Zoology building.

Health and Safety

The **Safety, Health and Welfare at Work Act 2005** places legal responsibility on students to take care of their own safety and that of others around them. The Medical Declaration forms signed in Junior Freshman year stated your agreement to abide by College's safety policies. These policies cover work in the laboratory, the field and all activities on campus. You must read the Faculty of Engineering, Mathematics and Science Health and Safety Guidance Manual to inform yourself of these procedures, which can be found on the Faculty local home page at: https://www.tcd.ie/stem/faculty-health-safety.php

Most practical classes for Senior Sophister Zoology are held in BIOLAB1, 2 or 3 in the Biology Teaching Centre or the Zoology Museum. Specific safety issues relating to the teaching laboratories will be explained to you before you commence practical work. These will include information on chemical, biological, mechanical and fieldwork hazards. If you are unsure of any aspect of safety, it is your duty to ask questions until you fully understand the risks and the protections in place to mitigate them.

Fire drills are held regularly. On hearing a fire alarm you must listen to all instruction given and gather at the Assembly Point until you are permitted to return to the building. Do not bring your belongings or ignore the alarm. This may delay your exit from the building.

The Discipline of Zoology has further health and safety information important to you on its local access page at: https://www.tcd.ie/Zoology/local/ If you have any questions regarding Safety, Health or Welfare please contact Zoosafe@tcd.ie

Emergency Procedure

In the event of an emergency, **dial Security Services on extension 1999 (+ 353 1 896 1999)**.

Security Services provide a 24-hour service to the College community, 365 days a year. They are the liason to the Fire, Garda and Ambulance services and all staff and students are advised to always telephone extension 1999 (+ 353 896 1999) in case of emergency.

Should you require any emergency or rescue services on campus, you must contact Security Services. This includes chemical spills, personal injury or first aid assistance.

It is recommended that all students save at least one emergency contact in their phone under ICE (In Case of Emergency).

Data Protection

Trinity College Dublin uses personal data relating to students for a variety of purposes. We are careful to comply with our obligations under data protection laws and we have prepared this short guide to ensure you understand how we obtain, use and disclose student data in the course of performing University functions and services. More information is available at https://www.tcd.ie/info_compliance/data-protection/student-data/

Student Support

There are many support services available in College incluging Tutor Services, Mature Student Office, Equality Officer, Day Nursery, Health Services etc. Information on these and how to access them is available on the consolidate Student Supports and Services page https://www.tcd.ie/students/supports-services/

Message from the Students' Union

"The Students Union is run for students by students. We represent you at college level, we fight for your rights, we look after your needs, and we are here for you to have a shoulder to cry on or as a friend to chat with over a cup of tea. As a student of Trinity College, you are automatically a member of TCDSU. Remember – we work for you, so if you think we should be focusing on a particular issue, get in touch!
The Students' Union website is a vital resource for Trinity students. It's the place to go if you have a problem in College - it has information on accommodation, jobs, campaigns, as well as information pertaining to education and welfare. The website also contains contact details for each Sabbatical Officer.
To stay in touch through social media, find us on Facebook at 'Trinity College Students' Union' to keep up to date with what we're doing. You can also follow us on Twitter @TCDSU."

More information is available at https://www.tcdsu.org

Illness/Disability

Issues regarding welfare and wellbeing are best brought to your tutor's attention or to the College Health Service. 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. Information relating to all support services is available at: http://www.tcd.ie/students/supports-services/ 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.

Co-curricular Activies

Co-curricular and extra-curricular activities are an important part of life and development. There are many societies and sports clubs available in College and you are encouraged to engage with these to maintain a healthy work-life balance. More information is available at http://trinitysocieties.ie and https://www.tcd.ie/Sport/. A reflection tool has been designed to assit you in capturing and articulating the learnings from any co- or extra-curricular activities; visit https://www.tcd.ie/students/reflection/ to find out more and download the tool.

Absence from College

Absence from College – Medical and Absence Certificates. Zoology, Botany and Environmental Science employs an approach similar to the Fresh years as administered by the Science Course Office.

Medical Certificates/Absence due to Illness

Where a student misses an assigned laboratory practical class through illness, they should **(a)** submit a Medical Certificate to the Zoology teaching office **on the day of their return to College** and **(b)** inform the laboratory practical supervisor of their absence at the next session.

Please use the Science **Medical Certificate** Form (**use with med cert from doctor**), which is available from Zoology office.

Self-Certification/Absence due to illness - three days or less

For periods of illness of **three days or less** (but **no more than seven days in any year**) a student may 'self-certify' their illness on the forms supplied, again to the Zoology teaching office on the day of their return to College.

The Science Medical **Self Certification** Form (**use for 3 days med not covered by doctor**) is also available from the Zoology teaching office.

Other Absences

Students who require to be absent from a laboratory practical classes or tutorials (with or without an associated assessment) for any other reason, such as a College or national sporting event or other situation, should inform the Zoology teaching office well in advance of the event (preferably a week beforehand). The Science Absence from College Form, **Sport or Other** is also available from the Zoology teaching office. Please note that filling in this form is **not a guarantee** that you will be afforded any accommodations with regard to marks or assignment of an alternative lab or tutorial session. In such cases decisions on what action/accommodations will be given is purely at the discretion of the individual disciplines concerned. The Zoology teaching office and course director do not have any jurisdiction in this situation.

Students who will not be in attendance for any extended duration during term time must have permission from Senior Lecturer via their tutor to be absent from College. Please refer to the absence regulations noted in the previous page.
Excuses for absence, presented after the event, **will not be entertained.** Students who anticipate that their sporting commitments may necessitate more than the occasional absence from College (e.g. Sport Scholars, etc.) should discuss their situation with their tutor, and the zoology course director.

NOTE: Please note that these regulations do not apply to absence from examinations. Students who are absent from examinations must contact their tutor as a matter of urgency and present any medical information/documentation to them.

Research Ethics

In line with Trinity College Dublin's Policy on Good Research Practice, all research in the School of Natural Sciences (SNS) should be conducted according to the overarching ethical principles of "respect for the individual subject or population, beneficence and the absence of maleficence (research should have the maximum benefit with minimal harm) and justice."

All individuals involved in research should facilitate and ensure research is conducted ethically. Ethical conduct in research is a shared responsibility. Primary responsibility rests with the Principal Investigator(s). Ethical responsibilities and legal obligations may overlap. All staff and students conducting research are required to ensure that their research is carried out in compliance with this policy. Ethical review is required before any studies involving human subjects, other living organisms and/or the natural environment, encompassing biosphere, geosphere, hydrosphere and atmosphere, commence. This requirement applies to staff, postgraduate and undergraduate students and volunteers/interns. Field- and laboratory work cannot commence until ethical review has been completed and approval has been gained. Staff or students planning to undertake research should complete the Research Ethics Application available from https://naturalscience.tcd.ie/research/

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 which is the Dublin University Zoological Society.

ZOOSOC http://trinitysocieties.ie/society/?socid=120 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.