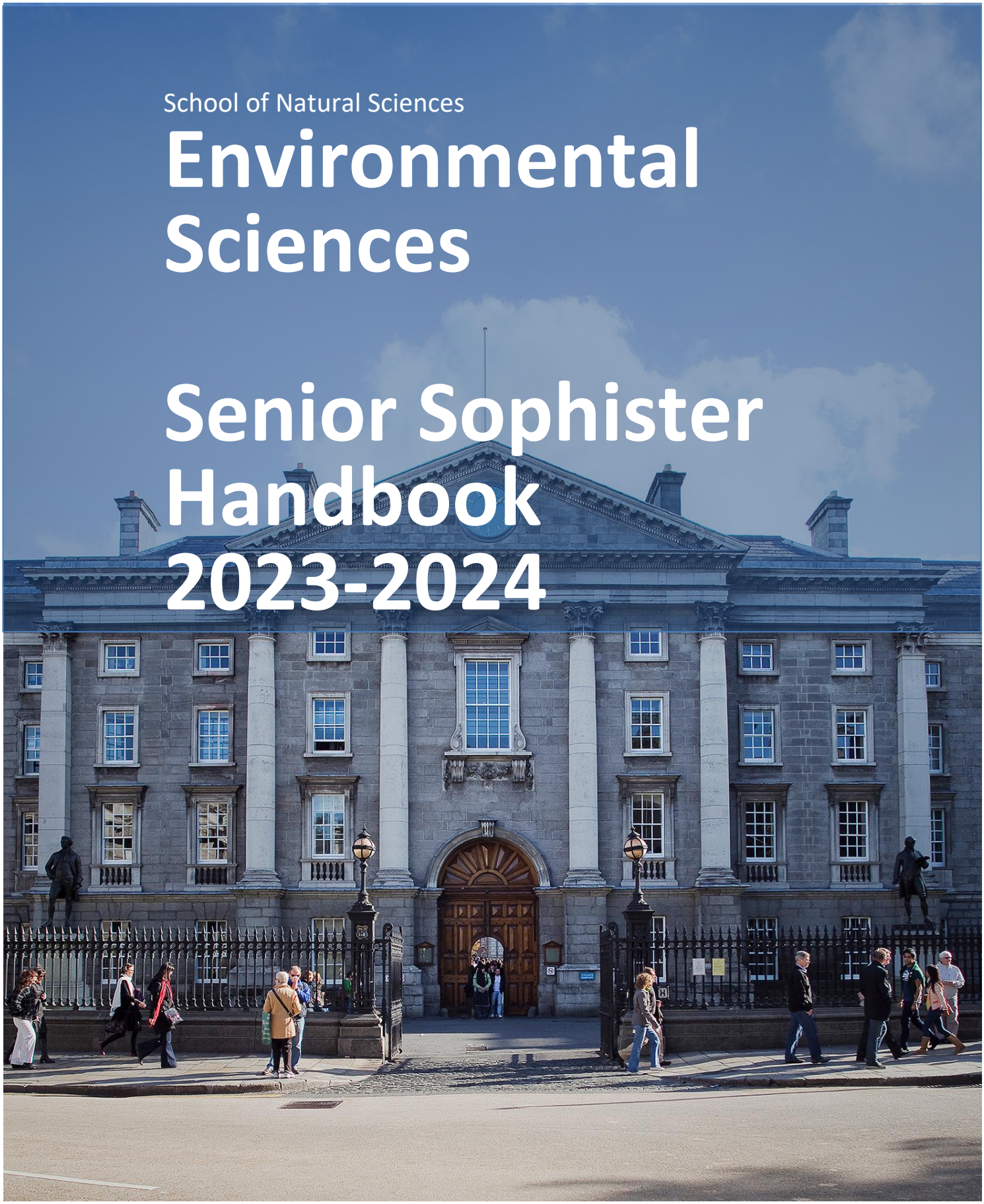
Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

School of Natural Sciences

Environmental Sciences

Senior Sophister Handbook 2023-2024



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General Information

A note on this Handbook

This handbook applies to all students taking the Environmental Sciences 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 download and retain a copy 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 will be updated on the Environmental Sciences undergraduate programme website.

Your attention is drawn to the University Calendar Part 1 (the relevant parts of which are available at registration, or from your tutor) and, in particular, sections G & P that outline general rules governing all students progression through College and the Faculty of Science; in addition your attention is drawn to Sections H5/H6 regarding attendance. In the event of any conflict or inconsistency between the General Regulations published in the University Calendar and information contained in course/departmental handbooks, the provisions of the General Regulations will prevail.

Welcome

Welcome to the Environmental Science Moderatorship Programme! This handbook aims to provide you with a basic overview of the Programme and the courses you will undertake during your Junior Sophister year with us.

Environmental Sciences is by its nature a multidisciplinary academic field, comprising a study of the frequently complex interactions between the biological, chemical and physical components of our environment. The environmental science discipline has evolved in recent decades as key environmental challenges such as climate change, pollution, sustainable development, deforestation and desertification to name a few, have become the focus of scientists, policy makers and the general public. Environmental scientists have training that is similar to other physical or life scientists, but is specifically applied to the environment. A broad scientific knowledge is required which involves a fundamental understanding of the physical and life sciences in addition to economics, law and the social sciences.

The undergraduate degree course offered by the School of Natural Sciences has been designed to provide for the needs of students with an interest in this rapidly developing academic and professional field. The programme comprises specially designed modules plus suitable modules from contributing disciplines. Field study and laboratory skills represent a core component of the programme and these are blended with the theoretical content to provide our graduates with the training required to become highly successful practitioners in this field.

We look forward to working with you during your sophister years with us and trust that you will find Environmental Sciences as fascinating and rewarding as we do.

Dr Jeremy Piggott
Environmental Science Course Director
September 2023

Course objectives and learning outcomes

Our mission is to:

- make you aware of the basic concepts, key challenges and current research developments in Environmental Science;
- enable you to understand the basis of good experimental design;
- teach you to work efficiently and safely in laboratories;
- enable you to become a competent field researcher;
- teach you to critically analyse quantitative data;
- develop your written and oral communication skills;
- develop your skills to work effectively in a group and independently; and
- make you socially aware, particularly in relation to the contribution that Environmental Science makes to society.

On successful completion of this programme, students should be able to:

- identify and describe plant and animal communities and analyse their distribution;
- demonstrate the principles of geochemical cycling in the global context with specific reference to environmental change;
- discuss the principles of hydrology and its relationship with groundwater quality;
- discuss the causes and effects of terrestrial, atmospheric and marine pollution and present day mitigation strategies;
- show a good working knowledge of skills and tools, such as spatial data analysis and statistical techniques, which can be used selectively to address complex problems, or to conduct closely guided research;
- identify, formulate, analyse and suggest reasoned solutions to current environmental problems;
- design an Environmental Impact Assessment for a range of diverse habitats;
- critically assess scientific literature;
- work effectively as an individual, in teams and in multidisciplinary settings; and
- communicate effectively with both the scientific community and with society at large.

Significant emphasis in this Moderatorship is placed on the student acquiring a broad range of laboratory and field skills that are relevant to Environmental Science practitioners. While the School makes every effort to keep expenditure for field courses as low as possible, however, it is necessary that students should budget appropriately. For information on financial assistance, contact: Senior Tutor's Office, House No. 27 (stosec@tcd.ie), or your tutor.

Note:
Students receiving local authority grants may be eligible for local authority support. Letters confirming attendance on courses can be obtained from the Course Director.

Please note: If cheques from Local Authorities are not received before the start of the Field Course, students will be required to pay the full amount and will be refunded this amount on receipt of cheques from Local Authorities. You are therefore advised to apply to your local Authority for funding well in advance of the field trips.

The European Credit Transfer System

The European Credit Transfer and Accumulation System 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 Credits are the recommended credit system for higher education in Ireland and across the European Higher Education Area.

The Credits 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, 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. The Trinity academic year is 40 weeks from the start of Michaelmas Term to the end of the annual examination period. 1 Credit represents 20-25 hours estimated student input, so a 5-Credit module will be designed to require approximately 120 hours of student input including class contact time and assessments.

Credits are awarded to a student only upon successful completion of the course year. Progression from one year to the next is determined by the course regulations. Students who fail a year of their course will not obtain Credit for that year even if they have passed certain component modules. Exceptions to this rule are one-year and part-year visiting students, who are awarded Credits for individual modules successfully completed.

In addition to the specified contact hours indicated under each module, you are expected to engage in work associated with the module to bring your input up to a total of at least 125 hours for a 5 Credit module.

Course structure

The Senior Sophister Environmental Science Moderatorship Programme consists of 60 European Credit Transfer Systems (ECTS Credits) per year. Senior Sophisters take a total of 45 mandatory Credits and optional modules up to 15 Credits. Some modules are examined entirely by in-course assessment however most are assessed by a combination of in-course assessment and examination. Further details on the assessment breakdown for each module can be found in the module descriptors below.

Core Modules

Core Modules	
Semester 1	**Semester 2**
ZOU44030 Data Handling (5 credits)	FBU44000 Capstone Research Project (20 credits)
ZOU44092 Environmental Impact Assessment (5 credits)	ESU44052 General Environmental Sciences (5 credits)
BOU44111 Restoration Ecology and Re-wilding (5 credits)	
ZOU44060 Research Comprehension (5 credits)	

Open Modules (students choose 15 credits from the following modules)

Open Modules	
Semester 1	**Semester 2**
BOU44109 Vegetation Description and Analysis (5 Credits)**	BOU44103 Plant Conservation and Biodiversity (5 Credits)
ZOU44013 Conservation & Wildlife Management (5 Credits)	GGU44977 Environmental Governance 2*(5 Credits)
BOU44107 Plant Animal Interactions (5 Credits)	BOU44114 Conservation Horticulture (5 Credits)
ZOU44021 Tropical Ecology and Conservation (5 Credits)	
ESU44054 Spatial Analysis using GIS (5 credits)**	
BOU44108: Plant Environment Interactions (5 credits)	

**If Students want to take both BOU44109 and ESU44054 they must agree to catch up on two missed GIS lectures in week 6 and 10 due to all day field trips with BOU44109.
* GGU44977 Environmental Governance 2 have a fixed quota of 5 students.

Module Descriptions

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 to 3 tutorial sessions per week spanning all of semester 1 in a flipped-classroom format with an active-learning ethos. 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.

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.

BOU44111: Restoration Ecology and Rewilding

Co-ordinator:	**Dr Marcus Collier**
Other Lecturers	Guest Lecturers
Assessment:	50% Examination, 50% Continual Assessment
ECTS:	5 credits
Semester:	1

Description:

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. In recent years the phrase 'rewilding' has emerged as a concept that embodies ecological restoration but with more future-oriented targets. 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 to 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 module students should be able to:

1. Understand the principals of restoration ecology 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
4. Understand the complex relationship between ecology, social values and policies
5. Evaluate the success of restored ecosystems and species

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

Carver, S., Convery, I., Hawkins, S., Beyers, R., Eagle, A., Kun, Z., . . . Soule, M. (2021). Guiding principles for rewilding. *Conserv Biol, 35*(6), 1882-1893. doi:10.1111/cobi.13730

GLA (Greater London Auithority). (2023). *Rewilding London: Final Report of the London Rewilding Taskforce*.

Higgs, E., Falk, D. A., Guerrini, A., Hall, M., Harris, J., Hobbs, R. J., . . . Throop, W. (2014). The changing role of history in restoration ecology. *Frontiers in Ecology and the Environment, 12*(9), 499-506. doi:10.1890/110267

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

Lorimer, J., Sandom, C., Jepson, P., Doughty, C., Barua, M., & Kirby, K. J. (2015). Rewilding: Science, Practice, and Politics. *40*(1), 39-62. doi:10.1146/annurev-environ-102014-021406

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

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

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 or a 48 hour take home exam depending on COVID-related restrictions at the time.

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

ESU44052: GENERAL ENVIRONMENTAL SCIENCES

Course type: Core
Coordinator: Professor Jeremy Piggott
ECTS Credits: 5 Credits
Assessment: 50% Continuous assessment, 50% Assignment

Description:

This module provides an opportunity for students to build on the content covered throughout the Sophister Environmental Sciences programme, and to explore in greater detail the key challenges facing Environmental Scientists today. Guest lectures also form a core part of this module, and will be given by practitioners in the environmental sciences field. Students are expected to integrate their approach to this material with the perspectives and skills they develop during their Sophister years. Appropriate literature relating to the Junior and Senior Sophister core (mandatory) modules will be recommended for detailed study.

The module is assessed through both continuous assessment and a problem-solving lab-based paper.

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

- Understand and describe topical issues related to the environment.
- Develop critical appreciation of the scientific literature.
- Explain important basic concepts and current developments in such key areas of environmental sciences as ecology, freshwater hydrobiology, hydrology, wildlife biology and environmental governance.
- State confidently the theoretical and practical aspects relating to essential field and laboratory techniques.

FBU44000 Research Project
(20 credits –Semester 2)

Module Personnel:
Dr. Rebecca Rolfe, 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. As part of the project students 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. The FBU44000 module culminates in the submission a thesis and presentation of a poster on the results.

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

BOU44109: VEGETATION DESCRIPTION AND ANALYSIS
Course type: Optional
Coordinator: Professor Stephen Waldren
ECTS Credits: 5 Credits
Assessment: 100% Continuous assessment

Description:
This module will describe how to sample, record and lead up to detailed multivariate analyses to help define vegetation communities. Though some theoretical and historical framework will be given in lectures, the emphasis will be on practical collection, analysis and interpretation of vegetation data. Various data sets will be utilised in computer-based sessions, and field work will be used to generate a novel data set, the analysis and interpretation of which will form part of the continuous assessment for this module.

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

- Employ effective methods to collect vegetation data
- Understand the theory and practice of vegetation description
- Employ a variety of measures to describe plant diversity in sampled vegetation
- Use multivariate statistical techniques to develop hypotheses about vegetation communities
- Utilise remotely sensed data and GPS in the field to map vegetation communities.

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.

BOU44108: PLANT-ENVIRONMENT INTERACTIONS
Course type: Optional
Coordinator: Professor Matthew Saunders & Dr Carla Harper
ECTS Credits: 5
Assessment: 50% Examination, 50% Continual Assessment

Description:
Plant growth is significantly influenced by the surrounding physical, chemical and biological environment. This module will address the key inter-related concepts of carbon assimilation and sequestration, plant water relations and energy balance components across the soil-plant-atmosphere continuum. Moreover, and as plants do not occur in isolation, this module will examine how fungi and fungus-like (e.g., Oomycota) interact with plants and the surrounding environment at multiple levels (soil interactions, roots, stems, leaves, and plant reproductive structures). The physiological response of plants to respond to a broad range of environmental conditions including abiotic and biotic extreme events will be explored, and the implications for natural and production-based systems will be assessed.

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

- Demonstrate an understanding of how environmental factors influence the physiological performance of plants at various stages of growth and across multiple spatial and temporal scales (leaf, whole plant, and ecosystem).
- Investigate using suitable methodological approaches how to monitor and quantify the impacts of key environmental drivers on physiological processes.
- Compare and contrast how plant systems respond to eternal drivers such as future climatic variability and land-use pressures.
- Demonstrate an understanding of the various interactions and ecological strategies among fungi, fungus-like organisms, and plants.
- Distinguish how these concepts can be implemented and utilised to address key issues in the sustainable management of land and the provision of food, fuel and fibre.

Indicative Reading:

Hall, D.O., Scurlock, J.M.O., Bolhar-Nordenkampf, H.R., Leegood, R.C. & Long, S.P. (eds) (1993). Photosynthesis and Production in a Changing Environment - A Field and Laboratory Manual, Chapman and Hall, London.
Jones, H.G. (2014) Plants and Microclimate - A Quantitative Approach to Environmental Plant Physiology. Cambridge University Press, Cambridge.
Lambers, H., Chapin, F.S., Pons, T.L. (2006). Plant physiological ecology. Springer, New York, USA.
Nobel, P.N. (2005). Physiochemical and environmental plant physiology. Elsevier Academic Press, Burlington, MA, USA.
Southworth, D. (ed.) (2012). Biocomplexity of Plant-Fungal Interactions. John Wiley and Sons, Chichester, West Sussex, UK.
Taiz, L., Zeiger, E. (2010). Plant Physiology. Sinauer Associates Inc., Sunderland, Massachusetts USA

BOU44107: Plant-Animal Interactions

Co-ordinator:	**Dr Jessica Knapp**
Other Lecturers:	Professor Yvonne Buckley
Assessment:	50% Examination, 50% Continual Assessment
ECTS:	5 credits
Semester:	1

Description:

In The Origin of Species (1859) Darwin emphasized that “plants and animals, most remote in the scale of nature, are bound together by a web of complex relations”. Plant-animal interactions have become increasingly recognized as drivers of evolutionary change and important components of ecological communities. This module will focus on pollination (the transfer of pollen between male and female reproductive structures in flowers) and herbivory (the consumption of plants by animals). The first half of the module will focus on antagonistic interactions between plants and herbivores, and explore plant and animal adaptations to herbivory, plant-herbivore dynamics and applications of interactions to ecosystem management. The second part of the module will focus on plant-pollinator interactions, including

pollinator-mediated evolution of floral traits, community level interactions, pollinator decline and conservation. Practical's will investigate plant and animal adaptations to herbivory, floral characteristics and adaptations for pollination, pollinator networks and.

The aims of the module are:

1. To promote your understanding of pure and applied ecology and evolution of plant-animal interactions
2. To equip you with the basic skills for carrying out laboratory experiments to examine plant-animal interactions.

Learning outcomes:

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

1. Synthesise and summarise aspects of the ecology and evolution of mutualistic and antagonistic plant-animal interactions, from individuals to communities, interactions between native and alien species, and applied issues.
2. Carry out laboratory work investigating pollination syndromes, plant-pollinator interaction networks and plant and animal adaptations to herbivory, and analyse and interpret data collected.
3. Work as a team to obtain, organise and present material on current topics in the field.

Indicative Reading List:

Herrera CM, Pellmyr O (2002). *Plant animal interactions: an evolutionary approach.* Blackwell Science, Oxford.

ZOU44021 Tropical Ecology and Conservation

(5 credits – Semester 1)

Module Personnel:

Prof Ian Donohue (module coordinator; ian.donohue@tcd.ie)
Prof Nicola Marples
Mr Colm Ennis
Prof John Rochford

Module Content:

The module comprises a short series of lectures followed by a nine-day residential field course in East Africa at the end of October (encompassing the reading week). The module will focus on the ecology and biodiversity of a range of ecosystems and habitats (including aquatic ecosystems [freshwater rivers and lakes, wetlands and saline lakes], tropical montaine forest and grasslands) and the connectivities among them. Issues and problems to do with human impacts and the conservation and management of these diverse habitats will also comprise an important element of the module. The module will focus particularly on the following topics:

- Quantifying biodiversity and the factors that underpin biodiversity in the tropics
- Economics of wildlife management
- Behaviour on the savannah
- Sustainable management of tropical ecosystems

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

1. Demonstrate holistic knowledge of East African geology, landscapes and ecosystems and the extent and nature of human interactions within them.
2. Understand the principles underpinning the ecology of tropical grasslands, forests, freshwaters and alkaline waters and be able to explain these to a layperson.
3. Evaluate the importance of natural background environmental fluctuations compared to those caused by human impact.
4. Synthesise and reconcile the conflicting arguments for the future of each of the ecosystems visited and be capable of integrating these arguments into sustainable management plans, which incorporate indigenous livelihoods.
5. Design a group research project on tropical ecosystem(s) of their choice.
6. Make a competent oral presentation, supported by a written synthesis, of their research proposal.

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

BOU44103: PLANT CONSERVATION AND BIODIVERSITY
Course type: Optional
Coordinator: Professor Stephen Waldren
ECTS Credits: 5 Credits
Assessment: 50% Continuous assessment, 50% Examination

Description:
Loss of biodiversity is one of the major problems facing humanity. The theoretical background to the evolution of plant diversity is firstly developed, and the principles of conservation are then used to develop approaches to conserve plant diversity. The module is taught through lectures and practical workshops.

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

- Identify key processes that lead to the development of higher plant diversity
- Explain how patterns of plant diversity have arisen
- Assemble, manipulate and critically analyse experimental data related to plant diversity
- Describe the processes that threaten plant diversity, and evaluate the degree of threat
- Evaluate national legislation and policy related to plant diversity and its conservation
- Evaluate global and national initiatives to conserve plant diversity.

ESU44054: SPATIAL ANALYSIS USING GIS
Course type: Optional

Coordinator: Professor Niamh Harty
ECTS Credits: 5 Credits
Assessment: 100% Continuous assessment

Description:
This module introduces students to the framework and methods used in real-life problems related to the field of Spatial Analysis by applying the theoretical knowledge gathered during the module to live project work. The module seeks to impart the necessary skills and knowledge to enable graduates to engage as team members and leaders in the types of large and complex sustainable environment projects that are increasingly being planned across the world. It aims to help fill a major and increasingly obvious skills gap. A unique feature of this module is the use of Dublin and Ireland as a learning laboratory, where the students will take responsibility of a project. The Spatial Analysis using GIS Module is designed to introduce the student to spatial analysis using a widely used Geographic Information Systems (GIS) platform.

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

- Solve Spatial Analysis problems by applying interdisciplinary approaches.
- Discuss and debate solutions to problems in the environment.
- Communicate effectively in technical and scientific writing, and present scientific/technical ideas concisely to a technical audience that may not be expert in the specific domain of the presentation.
- Implement technical knowledge to address a spatial analysis problem.
- Identify and use appropriate mathematical methods, numerical techniques and GIS tools for application to new and ill-defined spatial analysis problems.
- Describe succinctly, the relevant advantages and disadvantages of various technologies to a lay audience, and to communicate effectively in public.

Requirements:
This module will be taught 100% face to face. We will use the current most stable version of QGIS, which is version 3.28 LTR. This is available in College computer rooms on mytrinityapps, and may be downloaded from www.qgis.org to your Windows or Mac laptop if you wish.

GGU44977: ENVIRONMENTAL GOVERNANCE 2
Course type: Optional
Coordinator: Professor Rory Rowan
ECTS Credits: 5
Assessment: 100% Continuous assessment
Quota: fixed quota of x5 ES students only

Description: There is little disagreement that far-reaching societal, technological, political, and economic transformations are required if we are to avoid the worst effects of global, anthropogenic environmental change. What form these transformations should take and who should take responsibility for them are, however, far from settled.

This module considers some of the key conceptual debates and environmental conflicts arising in this context. Examination of these debates and conflicts will demonstrate the contested and uneven nature of environmental change and the measures sought to address these changes. The overall aim of the module is to help students develop a more nuanced, critical and multi-disciplinary understanding of environmental change and the different, often contested, ways of responding to such changes.

The module will consist of weekly interactive lectures/seminars, guest lectures, and set readings. Lectures will introduce students to key concepts and perspectives drawn from the broad field of political ecology. Each week part of the class will be set aside for students to develop their research projects. These projects will focus on a key area of environmental contestation in Ireland through a political ecology lens. The projects will involve group work and individual work, written assignments, oral presentations, and primary research. Class attendance is essential.

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

- Understand and apply key theoretical concepts from the field of political ecology to contemporary environmental debates and issues;
- Identify and critically discuss key sites of environmental contestation in Ireland today;
- Explain why an in-depth understanding of environmental problems today requires an understanding of the political, economic and social contexts out of which they emerge and within which they are managed
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Assessment: 100% Continuous assessment.

Module Breakdown: Contact Hours (Lectures = 10hrs; Seminars = 10hrs); Additional Input (Lecture & Seminar Preparation = 60hrs; Reading = 60hrs; Assessment Preparation = 110 hrs). TOTAL = 250 hrs.

Key texts:

- Castree, N. & Braun, B. (2001) *Social nature theory, practice, and politics*. London: John Wiley & Sons.
- Forsyth, T. (2003) *Critical political ecology: the politics of environmental science*. London: Routledge.
- Peet, D., Robbins, P. & Watts, M. (2011) *Global political ecology*. London: Routledge.
- Robbins, P. (2012) *Political ecology: a critical introduction* (2nd edition). London: Wiley.
- Castree, N. & Braun, B. (2001) *Social Nature: theory, practice, and politics*. London: John Wiley & Sons.
- Peet, D., Robbins, P. & Watts, M. (2011) *Global Political Ecology*. London: Routledge.
- Robbins, P. (2012) *Political Ecology: a critical introduction* (2nd edition). London: Wiley.

BOU44114: CONSERVATION HORTICULTURE

Course type: Open

Co-ordinators: Professor Jennifer McElwain and Dr Darrach Lupton (National Botanic Gardens Glasnevin)
Assessment: 100% Continual Assessment
ECTS: 5 credits

Description:
The loss of plant diversity is happening at an extraordinarily fast rate, the urgent need for conservation action has never been so crucial. Botanic Gardens are well-positioned to take on this challenge – they have a large pool of specialist horticultural expertise trained in propagation and cultivation techniques, scientific staff with an understanding of population and genetic basis of a conservation collection, and the accurate record-keeping and management of genetically representative living plant collections – skills and knowledge essential to the successful recovery of threatened plant species. Conservation horticulture is an emerging field in plant science that brings together the disciplines of conservation and horticulture. It remains formally undefined; however we define it here, as the practice within mainly Botanic Gardens and Arboreta of targeting, collecting and maintaining living plant collections that are representative of the genetic diversity of wild populations for *ex situ* conservation and habitat restoration purposes. This unique, timely and highly practical-focused module will be co-taught by staff at Trinity College Botanic Garden, Trinity Botany Department and the National Botanic Gardens, Glasnevin. Five practical sessions in hands-on conservation horticulture will be held at NBG and TCBG. 10 lectures will cover theory and both global and national case studies. One optional full Saturday field excursion will show case examples of good conservation horticulture practice in Ireland.
Learning outcomes:
On successful completion of this module students should be:

1. Able to explain the fundamental role of Botanic Gardens and Arboreta in local and global plant conservation
2. Able to describe both national and international policy frameworks for plant conservation
3. Familiar with basic hands-on horticulture practice used in plant conservation including growing a wide range of taxa from diverse habitats, soil mixes, tree conservation etc.
4. Familiar with hands-on plant propagation techniques of different plant types (e.g. woody perennials, bulbs, ferns, palms, cycads, orchids.) used in conservation horticulture
5. Familiar with the practices of seed collecting and seed banking as tools in plant conservation
6. Able to describe basic practices of maintenance of a living plant collection including pest management, ethical plant trade, integrated pest management and plant passports/ plant quarantine
7. Able to research and describe successful case studies of conservation horticulture globally

Indicative Reading:
A Handbook for Botanic Gardens on the Reintroduction of Plants to the Wild By J. Akeroyd (Editor) and Peter Wyse Jackson (Editor) Botanic Gardens Conservation International, 1995
ISBN: 0952027526

Restoring Diversity: Strategies for Reintroduction of Endangered Plants By Donald A. Falk (Editor), Constance I. Millar (Editor) and Margaret Olwell (Editor) Island Press, 1996 ISBN: 1559632976

Medicinal Plants: Conservation, Cultivation and Preservation by A. Chopra Daya Publishing House (August 1, 2007) ISBN: 8170354862

Academic Year 2023/2024

A full listing of the Academic Year Calendar 2023/2024 can be viewed here
https://www.tcd.ie/calendar/academic-year-structure/academic-year-structure.pdf

External Examiner

An external examiner, currently Professor Mairi Knight from the University of Plymouth (Professor Mairi Knight - University of Plymouth) moderates the Senior Sophister examinations. It is common practice for external examiners to viva students following the completion of their final examinations. The viva timetable will be available during the examinations.

Module assessment

Senior Sophister modules are also assessed by in-course continuous assessment and/or examination. Your final degree classification is based on a combination of marks including, continuous assessment, examinations and the submission of a thesis associated with the research project (FBU44000) and examinations. Please note that thirty per cent of the Senior Sophister overall mark is currently carried forward from the Junior Sophister year.

You should take care not to engage in plagiarism when completing all assessment exercises: for instance colluding with others to complete a word-processed practical report would be plagiarism unless approval had been sought in advance from the relevant lecturer. For further details it is advised that all students consult the College policy dealing with plagiarism (see section on plagiarism below).

You must indicate on any practical write-ups the name of your Partner(s) and his/her ID number(s).

Submission of continuous assessment material

To avoid any misunderstandings arising in relation to submitting continuous assessments please adhere to the following points as they are absolute:

- In accordance with college policy, all assessments must be submitted via Blackboard. Where this is not possible assignments must be submitted at the appropriate location (usually either the Botany or Zoology Offices, depending upon the module) before the set deadline. Students need to sign-off at the time of submission.
- Assessments left in staff pigeonholes, or handed to other members of staff will not be marked.
- For late submissions there will be a deduction of 5% per day, including weekends. Submissions received more than three days late, without a medical certificate, will not be marked. **ALL LATE SUBMISSIONS MUST BE HANDED IN DIRECTLY TO THE RELEVANT OFFICE TO THE EXECUTIVE OFFICER TO BE DATE STAMPED.**

- Any alternative arrangements must be approved by the staff member responsible for the assessment, and the relevant Executive Officer notified.
- Please remember it is important to keep all Continuous Assessment exercises when returned to you, until the Court of Examiners has awarded your final mark.

Plagiarism/Academic Integrity

To ensure that you have a clear understanding of what plagiarism is, how Trinity deals with cases of plagiarism, and how to avoid it, you will find a repository of information at the following links

- Academic Integrity homepage https://libguides.tcd.ie/academic-integrity
- Ready Steady Write tutorial: https://libguides.tcd.ie/academic-integrity/ready-steady-write
- Coversheet declaration: https://libguides.tcd.ie/academic-integrity/declaration
- Levels and consequences: https://libguides.tcd.ie/academic-integrity/levels-and-consequences

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 research subjects and populations should be treated fairly and equally)."

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 natural or man-made habitats commence. This requirement applies to staff, postgraduate and undergraduate students and volunteers/interns. Field- and laboratory work cannot commence until review has been completed and/or approval has been gained. **STUDENTS PLANNING TO UNDERTAKE RESEARCH SHOULD COMPLETE THE SNS** Research Ethics Application.

For further details please follow this link: www.naturalscience.tcd.ie/research/ethics [TCD username and password required]

Sophister Essay & Examination Marking Guide

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 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 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.
	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.
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

Sophister Project & Thesis Marking Guide

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.

Academic and Personal Issues

Academic Issues

If you experience any academic problems, below are some sources of assistance:

- Module Lecturer and/or coordinator
- Course Advisor
- Class representatives
- Head of Discipline
- Personal tutor (or any other tutor if you cannot find yours)
- Senior Tutor
- Head of School
- Director of Teaching and Learning (Undergraduate)
- Students' Union Education Officer, (01) 646 8439, Email: education@tcdsu.org

Personal Issues

If you experience any personal problems, below are some sources of assistance:

- Personal tutor (or any other tutor if you cannot find yours)
- Senior Tutor (stosec@tcd.ie)
- Student Counselling Service, 199/200 Pearse Street, College, Email: student-counselling@tcd.ie; (01) 896 1407
- Niteline: (each night of term, 9pm - 2.30am) at 1800 793 793 see poster below
- Student Health Service, House 47 - Medical Director: Dr David McGrath 01 896 1556; Doctors: Dr Mary Sheridan, Dr Aisling Waters, Dr Niamh Murphy 896 1556; Nurse: Ms Carmel Conway 01 896 1556; Health Promotion Officer: Ms Martina Mullin 01 896 1556; Physiotherapist: Ms Karita Cullen 01 896 1591;
- Welfare Officer, Students' Union, House 6, College (01) 646 8437, Email: welfare@tcdsu.org
- Chaplains; House 27, College: Alan O'Sullivan (Roman Catholic) 896 1260; Hilary Dungan (Church of Ireland) 01 896 1402; Julian Hamilton (Presbyterian) 896 1901; Peter Sexton (Roman Catholic) 01 896 1260
- Disability Services, Mr Declan Treanor, Room 3055, Arts Building (01 896 3111), Email: disab@tcd.ie
- Any student, member of staff or other person with whom you feel able to discuss your problems

NiteLine

NITELINE IS A LISTENING SERVICE, **FOR STUDENTS, RUN BY STUDENTS**

Free to contact via phone or instant messaging, we are open from 9 pm-2:30 am every night of term

There is no problem too big or too small - we just give our callers space to talk

We are also an information service, meaning we can direct callers to more specific services - including services specific to their college

NiteLine Dublin is founded on four key pillars:

Anonymous
Confidential
Non-Directive
Non-Judgemental

11

Calls averaged per night in the 2019/20 academic year

The most common call topics were college, mental health, and loneliness - but we are here to listen to whatever is on your mind

103

Volunteers in NiteLine in the 2020/21 academic year

Aside from our Public Faces (pictured above) all of our volunteers are anonymous. Volunteers go through 24 hours of rigorous training in active listening and much more. Apply to be a volunteer at niteline.ie

103,000

Students covered by NiteLine, supported by 150 Staff Ambassadors

NiteLine relies on the help of affiliate Student Unions, counselling services and other staff to reach and support students. To become a staff ambassador, or to register interest in affiliating with NiteLine, visit niteline.ie

Our Affiliate Colleges: Trinity College Dublin, DUBLIN, UCD, NCAD DUBLIN National College of Art and Design, DBS Dublin Business School, Maynooth University National University of Ireland Maynooth, RCSI

PHONE US: 1800 793 793
INSTANT MESSAGE US: NITELINE.IE
FIND OUT MORE INFO: INFO@NITELINE.ORG
FIND US ON INSTAGRAM: @NITELINEDUBLIN

Good Governance Awards 2020 WINNER

WINNER OF THE CARMICHAEL CENTRE GOOD GOVERNANCE AWARD

Health and Safety

LEGAL BACKGROUND

The University must exercise a "duty of care" to employees and those they supervise. This duty of care is recognised in both criminal and civil law. There is also a duty on everybody to take reasonable care for their own safety and the safety of those around them.

DISCIPLINE SAFETY OFFICERS

Botany - Botany Building , Anatomy Building & Dartry Gardens – Siobhan MacNamee, Siobhan.McNamee@tcd.ie
Environmental Science - Anatomy Building – Mark Kavanagh, kavanamg@tcd.ie
Geography-Museum Building–Dr Elaine Treacy treacyel@tcd.ie
Geology - Museum Building, TTech Pearse St. – Cora McKenna, mckennc6@tcd.ie
Zoology – Zoology Building – Alison Boyce, aboyce@tcd.ie

CONTRIBUTING DEPARTMENTS

Each of the four disciplines that comprise the School of Natural Sciences (i.e. Botany, Geography, Geology and Zoology) contribute courses to the Environmental Science Moderatorship. Courses will be run in the lecture and laboratory facilities in each Department building. You must make yourself aware of the safety regulations and house rules for each department. You should also become familiar with the department resources available to you, such as libraries, museums and IT facilities. Information can be found on each department web site or by contacting the Chief Technical Officer or Executive Officer.

THE LABORATORY

In formal laboratory exercises will have been risk assessed. You will be under supervision in a controlled environment where all reasonable safety precautions have been considered and all hazards identified. .You have a legal obligation to follow the instructions of those in control of the laboratory. You have a duty of care for yourselves and those who may be affected by your actions. This means that your behaviour in the laboratory must be such that you do nothing to place either yourself or other laboratory users at risk. If you do not understand any instructions you **must alert those in control**.

Instrumentation in a laboratory is an area of high risk. If you have not used an instrument before you will not know the potential dangers it may pose. Do not interfere with any piece of equipment or use it without prior instruction. The staff, both academic and technical, along with the demonstrators, are available to instruct you so always ask to be taken through the use and dangers of any piece of equipment which you have to use.

FIELDWORK

Fieldwork is defined as any practical work carried out in the field by staff or students of the University for the purpose of teaching and/or research. By definition it occurs in places which are not under the control of the University, but where the University is responsible for the safety of its staff and students.

Please note:

Voluntary and Leisure activities are excluded.

Outside of Voluntary and Leisure activities, the Head of Discipline has overall responsibility for health and safety in their area. They are required to ensure that the risk assessment of the fieldwork is made and to ensure that a safe system of work has been established for all staff and students. This duty is frequently delegated to the member of staff organising the fieldwork. The Head of Discipline must ensure that the fieldwork meets the safety criteria of the School, and that accidents are reported and investigated. There is a Department Safety Officer, who is responsible for day-to-day safety matters.

There is a duty on the fieldwork participants to take reasonable care for their own safety and the safety of those affected by them.

Some staff and students may be unable to carry out certain types of fieldwork due to any number of physical or medical conditions and early identification of such problems is essential.

There are a number of forms that must be completed before Laboratory or Fieldwork is begun. Please note that it is compulsory for each student to fill these forms in prior to beginning fieldwork. These may include Health Declaration Forms, Code of Conduct Agreement and Risk Assessment. The forms must be returned to the relevant Discipline Safety Officer.

Relevant and suitable protective equipment must be worn. Participants must dress appropriately especially in cold and wet conditions. When the activity involves the use of boats other than registered ferries appropriate life jackets must be worn.

The School of Natural Sciences has prepared a detailed set of instructions relating to field-work. Available at:
http://www.naturalscience.tcd.ie/healthsafety/

FIRE

Fire Prevention

Copies of the College General Fire Notice are displayed in all Departments. Familiarise yourself with the instructions in case of fire. Any defect or potential fire hazards should be reported to the building Fire Warden.

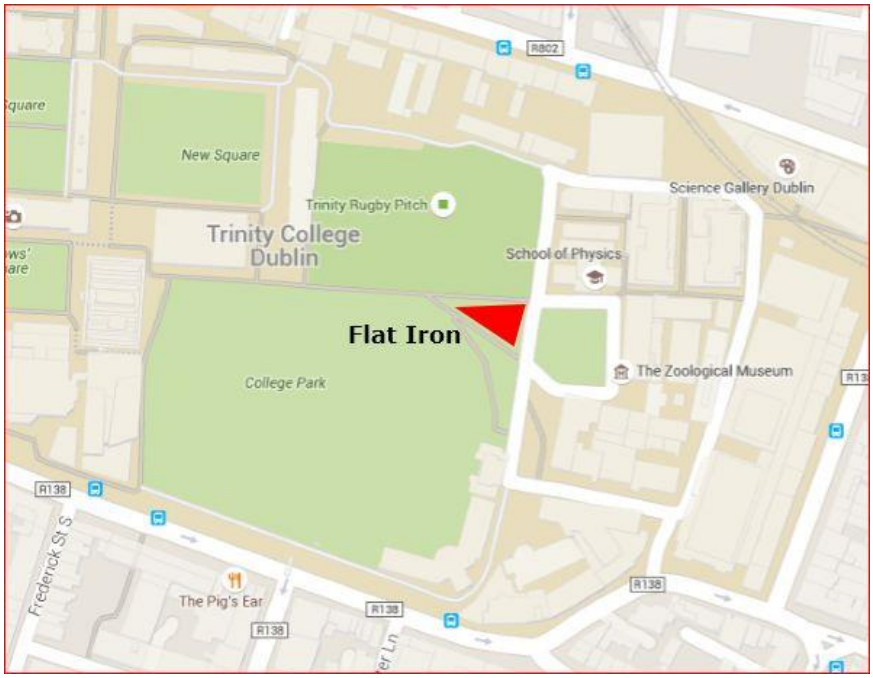
Note the position of fire extinguishers in your working area. Please note you are not permitted to use a fire extinguisher unless you have attended the College's training course.

Before leaving offices or laboratories:-

- ensure that all litter bins do not contain any smouldering materials.
- do not leave litterbins under or near to any combustible items e.g. desks, tables, shelving etc.
- close all filing cabinets and presses.
- switch off and unplug electrical equipment not in use.

In Case of Fire

– There is a fire alarm system in the buildings controlled by all Disciplines. If the alarm bells ring or someone shouts 'fire', all persons in the building must exit as rapidly as possible and assemble at the appropriate assembly point For Botany, Zoology and Centre for the Environment this is located at the Grass triangle ('Flat Iron') at east end of Boardwalk (College Park), designated Fire Point D:



At the assembly point organise yourselves into laboratory or functional groups and the senior person present must take a roll-call. Missing persons must be reported immediately.

Inform the Front Gate Security Officer, emergency no. ext: 1999 (01 896 1999 from mobile) or the 24 hour security no. ext: 1317 (01 896 1317), who will call the fire brigade.

BOMBS/HOAX BOMB CALLS/BOMB WARNINGS

Keep an eye out for suspicious packages at all times. If one is observed report it to the Chief Technical Officer or another staff member. If a bomb is thought to be in the building, procedures essentially follow those employed in the case of fire. Report to

College authorities on ext: 1999/1317 (Front Gate Security Officer & 24 hour Security) who will call the Gardaí.

FIRST AID

First Aid boxes are placed in every laboratory. These boxes contain a range of dressings and bandages for treatment of minor cuts and burns. DO NOT USE AN ITEM WITHOUT SUBSEQUENTLY INFORMING A TECHNICAL OFFICER. This ensures the incident is recorded and the items used are replaced. A list of trained First Aiders is displayed on each first aid cabinet.

REPORT ANY DEFICIENCY OF THE ITEMS IN OR ON THE BOX TO THE RELEVANT CHIEF TECHNICAL OFFICER.

All accidents must be reported to the Safety Officer and entered in the accident book. An accident report form will be completed. Dangerous occurrences (near misses) must also be reported on the appropriate form.

In the event of serious accident or medical emergency requiring the emergency services, quickly report it to the Chief Technical Officer in that building or the senior person present, then call the Front Gate Security Officer ext: 1999/1317 During office hours minor medical assistance can be obtained from the Student Health Service ext: 1556/1591

First Aid may only be carried out by a trained first aid responder. In the field, all staff and demonstrators carry an individual first aid kit. Departmental vehicles carry a more extensive kit. Report all field injuries or illness immediately to the leader of the field trip. You must always adhere to the instructions and directions of the field-leader.

General Information

Central Societies Committee **http://trinitysocieties.ie/**

TCD Environmental Science Society http://trinitysocieties.ie/society/?socid=34 & Facebook group https://www.facebook.com/TCDEnvironmentalSociety/

Dublin University Central Athletics Club DUCAC **http://www.tcd.ie/Sport/student-sport/ducac/?nodeId=94&title=Sports_Clubs**

Trinity College Students Union **https://www.tcdsu.org/**

Trinity College Graduate Students Union **https://www.tcdgsu.ie/**

Key Locations

Academic Registry **https://www.tcd.ie/academicregistry/**

TCD Portal my.tcd.ie

Blackboard **https://tcd.blackboard.com/webapps/login/**

Staff Contacts

Staff	Office location	Ext	Email
Teaching staff			
Prof Yvonne Buckley	Zoology Building	3172	buckleyy@tcd.ie
Prof Marcus Collier	Centre for the Environment	1641	colliema@tcd.ie
Dr Silvia Caldararu	Aras an Phiarsaigh		caldaras@tcd.ie
Prof Ian Donohue	Zoology Building	1356	ian.donohue@tcd.ie
Prof Robbie Goodhue	Museum Building	1419	goodhuer@tcd.ie
Prof Niamh Harty	Civil Engineering	1302	Niamh.Harty@tcd.ie
Prof Andrew Jackson	Zoology Building	2278	jackson@tcd.ie
Prof Pepijn Lujckx	Zoology Building	1926	luijckxp@tcd.ie
Prof Nicola Marples	Zoology Building	2527	nmarples@tcd.ie
Prof Jennifer McElwain	Botany Building	2294	jmcelwai@tcd.ie
Prof Fraser Mitchell	Botany Building	1811	fmitchll@tcd.ie
Prof Jeremy Piggott	Zoology Building	1642	Jeremy.Piggott@tcd.ie
Prof John Rochford	Zoology Building	2237	rchfordj@tcd.ie
Prof Rory Rowan	Museum Building		rowanro@tcd.ie
Prof Matthew Saunders	Botany Building	4870	saundem@tcd.ie
Prof Jane Stout	Botany Building	3761	jane.stout@tcd.ie
Prof Steve Waldren	Trinity Botanic Gardens, Dartry	5117	swaldren@tcd.ie
Prof Mike Williams	Botany Building	2421	willimsm@tcd.ie
Dr Jessica Knapp	Botany Building		KNAPPJ@tcd.ie
Dr Richard Nair	Botany Building		richard.nair@tcd.ie
Dr Peter Moonlight	Botany Building		MOONLIGP@tcd.ie
Dr Jenny Bortoluzzi	Zoology Building		bortoluj@tcd.ie
Technical Staff			
Ms Patricia Coughlan	Botany Building	1275	coughlp@tcd.ie
Mr Mark Kavanagh	Centre for the Environment	1017	kavanamg@tcd.ie
Ms Siobhan McNamee	Botany Building	1309	smcnamee@tcd.ie
Ms Jackie Stone	Centre for the Environment	1275	jstone@tcd.ie

Dr Martyn Linnie	Zoology Building	1679	mlinnie@tcd.ie
Ms Alison Boyce	Zoology Building	3506	aboyce@tcd.ie
Ms Sinead Kelly	Zoology Building	3506	kellys76@tcd.ie

Administrative Staff

Ms Mandy Lockhart	Undergraduate Teaching Office, Room 0.2, Botany Building	1274	ZOBOES@tcd.ie
Ms Fiona Moloney	Undergraduate Teaching Office, Zoology Building	1366	ZOBOES@tcd.ie