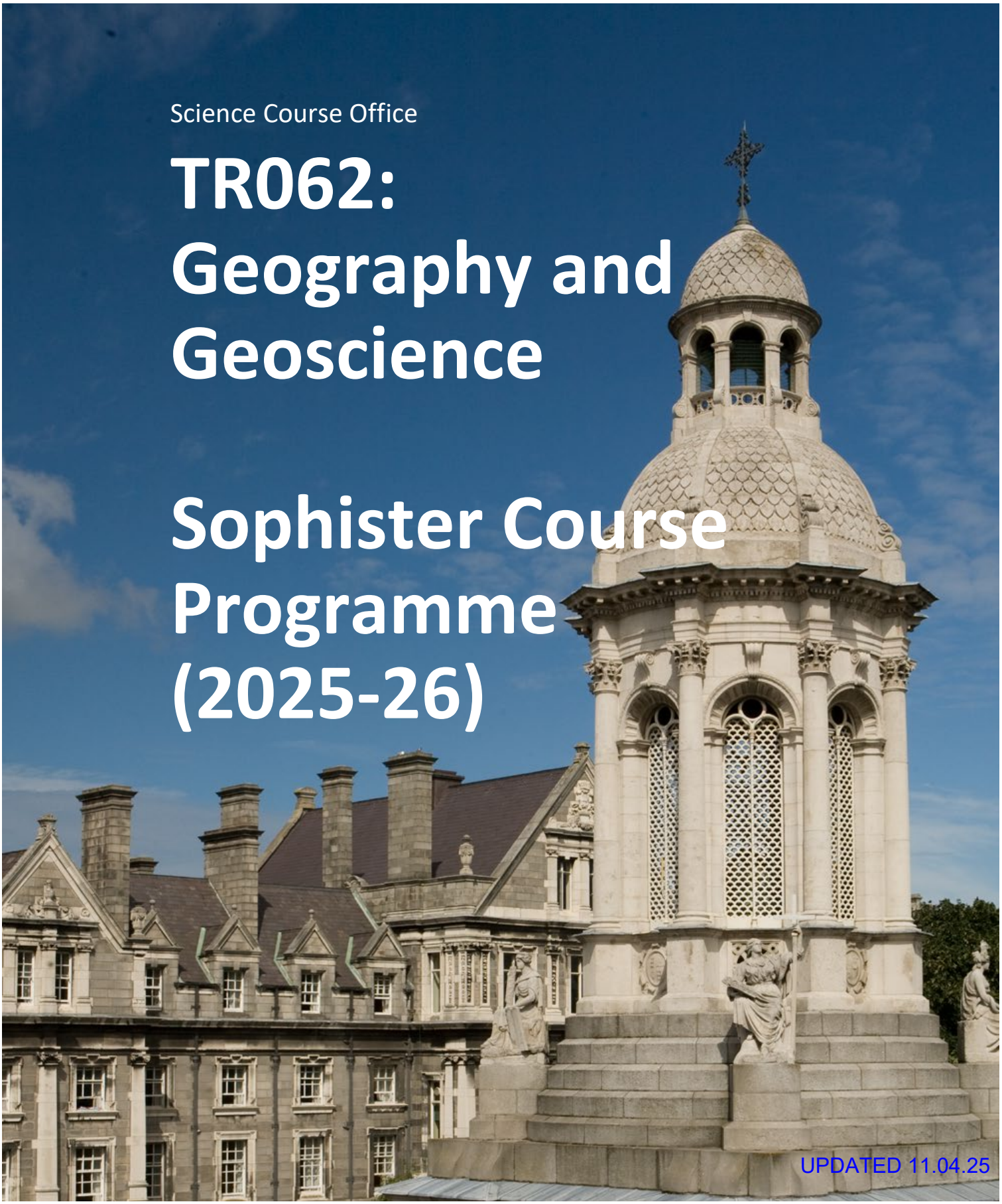
Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin



Science Course Office

TR062: Geography and Geoscience

Sophister Course Programme (2025-26)

UPDATED 11.04.25

This programme booklet applies to all student taking TR062: Geography and Geoscience. It provides a guide to what is expected of you on this programme and the supports available to you. Please retain for future reference.

The information provided is correct at the time of publication. Any necessary revisions will be notified to students via email and the TR062: Geography and Geoscience webpage: https://www.tcd.ie/science/undergraduate/tr062-geography-and-geosciences/junior-sophister-/

In the event of any conflict or inconsistency between the General Regulations published in the University Calendar and the information provided in this course programme, the general college regulations will prevail: https://www.tcd.ie/calendar/undergraduate-studies/general-regulations-and-information.pdf

Produced by:	The Science Course Office Trinity College, Dublin 2
Email:	Science@tcd.ie
Webpage:	https://www.tcd.ie/science/undergraduate/

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Welcome

Dear Students

Congratulations – you are nearing the end of the Freshman years of your degree and are ready to make the important decision about which science Moderatorship you wish to pursue. The Freshman course structure has given you an excellent grounding in your core subject to prepare you for the advanced material you will cover in your Sophister years. You have also had opportunities to take open modules in other science subjects that have given breadth and context to your science education.

Development of educational breadth continues in the Sophister years via the opportunity to take further open modules and also Trinity Electives. Trinity Electives are stand-alone, College-wide modules that enable you to broaden your knowledge outside of your chosen subject. There is a wide range of choice available to you that encompasses languages and cultures, key societal challenges and Trinity's ground-breaking research activities. A list of the modules can be found at this link (https://www.tcd.ie/trinity-electives/electives/). Having the opportunity to develop these broader skills, particularly in communication and presentation, will allow you to derive the greatest benefits from your particular choice of Moderatorship subject and will give you important insights into other subjects and modes of scholarship outside of the sciences.

I wish you the very best in your Sophister years and look forward to seeing your future successes and achievements.

Prof Fraser Mitchell
Associate Dean of Undergraduate Science Education

IMPORTANT NOTE:
The details contained in this booklet are subject to change. In the event of any conflict or inconsistency between the General Regulations published in the University Calendar and information contained in this course handbook, the provisions of the General Regulations will prevail**.** https://www.tcd.ie/calendar/undergraduate-studies/general-regulations-and-information.pdf

Foreword

The purpose of this booklet is to provide you with information on modules that will be available to you in the Sophister (3rd and 4th) years in Geography and Geoscience. For those of you who entered the TR062 Geography and Geoscience programme, you now have to decide which Moderatorship subject (degree course) you wish to study. For some this will be very easy, because you have known from entry which course you wish to follow. For others, the decision may require a bit more thought and this booklet is designed to furnish you with all the information you need to make your choice.

The TR062 programme is designed so that many sophister modules are available to students from both Moderatorships, reflecting the closely aligned nature of Geography and Geoscience. The distinctive nature of the two courses comes from the combination of subject material that can be taken alongside these shared modules. If you have developed an interest in studying Geography, spanning the physical, human and environmental aspects of the discipline, you are advised to select the Moderatorship in Geography. This will give you access to a wider range of Geography modules than are available to those selecting Geoscience, permitting you to pursue a broad programme in Geography or to specialise in a particular sub-field of the discipline.

If your interests are more aligned with studying the physical, chemical and biological mechanisms of Earth system functioning, extending from contemporary processes through to those operating over deep time, you are advised to select the Geoscience Moderatorship. Within the Geoscience Moderatorship, students will have the option of two pathways; A Geology Path will provide you with the foundations of earth processes and how they relate to the evolution of our Planet and Solar system as well as Society's relationship with our lithosphere from the perspective of natural hazards and resources; An Earth Systems Science Path will give you access to a wider range of Geoscience and Geography modules than are available for those selecting Geology, allowing you to pursue a broad programme that may focus surficial processes, climate and environment.

These moderatorships have been designed to provide you with the skills and experience necessary to fulfil a future career in Geography and Geoscience. I wish you well over the next two years, whatever choices you make, and I trust you will maintain the tradition we have of producing the very highest quality of Science graduates.

Dr Sean McClenaghan
Director of the TR062 Geography and Geoscience Course

Introduction

Sophister courses in Science are organised so that students follow a continuous programme of work over two years leading to a Moderatorship in a particular subject. Each module has a specified credit value, where one credit represents a minimum of 20 hours of student work. This work will comprise a varying balance of contact hours (e.g. time in lectures, practicals or the field), time for independent study and time spent undertaking coursework or examinations. Students take modules to the value of 60 credits in each of the Sophister years.

The Sophister Course Booklet is intended as a guide to the Moderatorships in Geography and Geoscience. More detailed descriptions of module content and assessment requirements will be published in the individual Moderatorship handbooks at the start of each academic year.

Although the information in this handbook is correct at the time of production, the precise content of the Moderatorships is subject to change. While every effort will be made to give due notice of major changes, the Science Course Office reserves the right to suspend, alter or initiate courses, timetables, examinations and regulations at any time.

*****NOTE*** Students should expect to pay fees for mandatory field courses, which can take place in the 1st week of Semester 1 as well as reading week and final week of Semester 2. Fees can range from €500 to €1000 for any given field course and covers field materials, transport, food and lodging.*****

Description of ECTS system

The European Credit Transfer and Accumulation 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**. Within Undergraduate courses 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. Within Postgraduate courses 1 credit represents 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 only 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 and part-year visiting students, who are awarded credit for individual modules successfully completed.

Allocation of Places

The Science Course office coordinates and processes the applications for Junior Sophister places in the TR062: Geography and Geoscience Course. The procedures documented below show students that those places are allocated in a fair, transparent, and efficient manner. The number of places available in each moderatorship is limited by quota. **Allocation is based on the overall mark obtained in the Senior Fresh year** and the order of choice expressed by the student.

The Science Course Office allocates Junior Sophister places. Students cannot be allocated a place by circumventing the Science Course Office and going directly to disciplines. All enquiries regarding the allocation of places, made to disciplines, will be redirected to the Science Course Office via the sophistersco@tcd.ie email address.

Places will be allocated as follows until quotas are reached:

1. All students passing their Senior Fresh year will be placed in **rank order** based on their **overall Senior Fresh year mark**.
2. Students who fail and are required to sit reassessment must reapply for the remaining unfilled places until quotas are reached. Second round forms will be made available via the relevant course page on the Science website: https://www.tcd.ie/Science/ following publication of the first round.
3. Students who are given permission by the Senior Lecturer to defer assessments and or examinations until the reassessment session may defer a place in their **first** preference only. Following publication of the results, students who pass at the reassessment session will be allocated a place based on the same criteria used in the first-round allocation of places. If the student in this category does not qualify for the deferred place, the Science Course Office will allocate that student a place in one of the subjects available in the second round and the deferred place will be offered to the next qualified student from the first-round allocation.
4. In the event a student fails at the reassessment session, be that a deferred exam or reassessment, and are eligible to repeat the SF year, they can do so in **one** of the following ways:
   - Repeating the year in full on books, such students will be treated in the same way as all other SF students in that year.
   - Students may request permission from the Senior Lecturer, via their tutor, to repeat the year off books taking assessment (**OBA**). Sitting an exam OBA is a repeat examination therefore, such students will be allocated a place in one of the remaining Moderatorships available at the **reassessment session** the following year. Students may not repeat more than 20 credits OBA.
5. Students who have passed in the **first round** who then opt to go 'off books' for the year (**OBN**) rather than take up the place offered, will be allocated a place in the first round along with rising JS students in the following year. Places will **not** be reserved for such students.
6. Students who pass in the second round and opt to go "off books" prior to places being allocated, will be allocated a place at the **reassessment session** in the following year.
7. Results will be available on your personal portal at my.tcd.ie by the stated publication date.
8. Publication of first round JS places will be available through the my.tcd.ie portal once the academic year rollover happens in July.
9. Students are informed by email when the places are published, and the procedures followed are clearly outlined in the email.

Special note: Students who have passed their Senior Freshman year may not repeat the SF year to improve their performance.

Course Coordinators:

Moderatorship	Name	Email address
TR062 Course Director	Dr Sean Mc Clenaghan	mcclens@tcd.ie
Geography	Dr Margaret Jackson	MARGARET.JACKSON@tcd.ie
Geoscience	Dr Michael Stock	michael.stock@tcd.ie

Moderatorship Quotas

The numbers of places available in each Moderatorship subject is limited by quota as outlined below:
TR062 Geography = 18 places
TR062 Geoscience = 42 places

- Earth System Science Path = 24 Places
- Geology Path = 18 Places

Moderatorship Preference Form
Students are required to complete the choice of subject form. You will rank your subject preferences for e.g. Geography-1, Geoscience -2. The Moderatorship preference form is available online: https://forms.office.com/e/fiYuDEasXR. The closing date for submission of this form is **Friday 18th April 2025**.

Open Module Choice Forms
Students take modules totalling 60 credits in the Junior Sophister year. There are 40 credits of core modules, and 20 credits of open modules spread equally over two semesters in the academic year. The module structure for each individual moderatorship is listed in the following pages. In addition, students can choose one or two (one per semester) 5 credit Trinity Elective modules as shown in the module structure table for each moderatorship subject.

Students can choose their open modules with the help of the Moderatorship Course Advisor following the allocation of moderatorship places. **Open module choice forms will be available from your moderatorship disciplines**.

Students should note that due timetable constraints Open Modules may delivered via a blended learning approach involving face to face and online teaching for some open modules.

Trinity Electives

https://www.tcd.ie/trinity-electives/

The Trinity Electives are a unique feature of your Trinity Education. They are stand alone, College-wide 5 credit modules. They cover a broad range of topics in the arts, humanities, sciences, health and social science, and technology. They are designed to allow students to study topics outside of their core discipline and thus provide breadth in their education. BBS students take a minimum of one and a maximum of two (one per semester) Trinity Electives in the Junior Sophister year. Depending on your moderatorship, you will choose a combination of Trinity Electives and Open Modules as described in this handbook.

Choosing your Trinity Elective

The choice of Trinity Elective is student driven. Almost all Trinity Electives are open to all students. However, students of some moderatorships may be precluded from taking certain Trinity Electives (e.g. the module 'From Planets to the Cosmos' is not available to TR063 Physical Sciences students, as this topic is part of their core discipline). The list of exemptions is outlined in the Trinity Electives webpage: https://www.tcd.ie/trinity-electives/

Selection of Trinity Electives will be made through online enrolment which will open in July 2025, after publication of examination results and allocation of moderatorship places. You will select your Trinity Electives on a first come first served basis through online module enrolment in your TCD portal.

The Trinity Electives website provides full details of each of the Trinity Electives. A list of the Trinity Electives can be found at https://www.tcd.ie/trinity-electives/

You need to think carefully about your choice of Trinity Elective as the semester in which you take it (Semester 1, Semester 2 or both) will affect your choice of Open Modules. That is: taking one Trinity Elective in the first semester, restricts you to the open modules in Option 1; taking one Trinity Elective in the second semester, restricts you to the open modules in Option 2 while taking two Trinity Electives, (one in each semester) restricts you to the open modules in Option 3. Please refer carefully to the tables in this handbook.

Open Module Changes

If you wish to change your open module scenario, you must consult the relevant Course Advisor for advice prior to submitting your request.

Closing dates for change of Open Modules/TE's scenarios for Science Students

Semester one: 5pm on Friday 26th September 2025

Semester two: 5pm on Friday 28th November 2025

NOTE: Trinity Elective changes submitted directly to the Academic Registry will not be accepted without the relevant sign off from the Course Advisor.

Junior Sophister Examination Information

Modules are assessed by continuous assessment and/or by examination. The Junior Sophister year is comprised of modules to a total of 60 credits. The distribution scheme of marks between papers and practical work at the Sophister examinations will be published by individual schools or departments/disciplines.

Calculation of Moderatorship results

The final moderatorship results are calculated as a weighted average of the overall result for the Junior and Senior Sophister examination results.

Junior Sophister 30%, Senior Sophister 70%:

Geography and Geoscience.

Assessment Regulations

Reassessment - Regulation 8: Undergraduate Progression and awards regulations

- Same progression regulations, including compensation, for assessments relating to semesters 1 & 2 and to reassessment.
- Automatic right to reassessment for a student who has achieved a fail grade in any of their modules and is not eligible for compensation.
- Students (in all years) should only be required to re-sit examinations or re-submit coursework for failed modules or components thereof.
- Students are not permitted to present for reassessment in any module for which they have achieved a pass grade, in order to improve their academic performance.
- Rescheduled exams within the session will no longer be permitted.
- Different reassessment modalities permitted.
- No capping of marks

Repetition of a year: Regulation 7: Undergraduate Progression and awards regulations

- Students are not permitted to repeat any academic year more than once and may not repeat more than two academic years within a programme.
- Repetition of a year is in full, i.e., all modules and all assessment components
- A student's academic record on their transcript will show clearly the time lost through repetition of a year.
- There will be an option to repeat a year on an 'off-books' basis.

Full Progression and Awards regulations can be found via the following:
https://www.tcd.ie/teaching-learning/academic-affairs/ug-prog-award-regs/index.php

Academic Integrity Policy

Trinity College Dublin, the University of Dublin, is committed to upholding academic integrity, and recognises that it underpins all aspects of university life, including all activities relating to research, learning, assessment, and scholarship.

Trinity therefore considers academic misconduct to be serious and academically fraudulent and an offence against academic integrity that is subject to the Trinity procedures in cases of suspected misconduct.

The Academic Integrity Policy (https://www.tcd.ie/media/tcd/about/policies/pdfs/academic/Academic-Integrity-Policy.pdf) should be read in conjunction with (and is subject to) the University Calendar, Part II on Academic Integrity (This policy replaces the Plagiarism Policy).

Other sources of information are available:
https://www.tcd.ie/calendar/undergraduate-studies/
https://libguides.tcd.ie/academic-integrity
https://www.tcd.ie/teaching-learning/academic-affairs/academic-integrity/
https://www.tcd.ie/teaching-learning/academic-affairs/academic-integrity/mandatory-academic-integrity-training/

Guidance on the use of AI and Generative-AI in College

The advent of commonly available artificial intelligence tools are disruptive in both positive and negative ways. Before using them in your studies it is important that you familiarise yourself with College policies on its use. Unless otherwise instructed for particular modules or assessments, **the default expectation would be that you do not submit AI generated content as an attempt at an assessment**.

Below is some basic overview of the College policy on AI and GenAI. This has been taken from the more detailed policy which is informative and wide ranging. You are expected to have read and familiarised yourself with this policy.
https://www.tcd.ie/academicpractice/resources/generative_ai/

Artificial Intelligence (AI)
Artificial intelligence is generally understood to be a set of technologies that enable computers to perform a variety of functions usually perceived as requiring human intelligence – for example, understanding speech, recognising objects in images, composing written answers and problem reasoning. A more formal definition of an AI system from the European Union AI Act (2024) is:
...a machine-based system designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments[.] (EU AI Act 2024)

Generative Artificial Intelligence (GenAI)
Generative AI is the sub-area of AI, involving AI systems which generate content — for example, human dialogue, speech, images and video. GenAI systems are capable of generating such content based on a user's request or instruction. More formally, GenAI is defined by UNESCO **as "an artificial intelligence (AI) technology that automatically generates content in response to prompts written in natural-language conversational interfaces" (UNESCO 2023).**

AI and GenAI in Trinity
As Ireland's leading university and as a world leader in AI research, Trinity recognises that AI and GenAI offer new opportunities for teaching, learning, assessment and research. We also recognise that these technologies present challenges and risks, including to academic integrity, ethics, privacy, impartiality, intellectual property and sustainability.

Acknowledging these opportunities and challenges, Trinity commits to supporting the opportunity for students and staff to become AI literate and fluent, thereby helping them to navigate and respond to the challenges and risks of AI and GenAI in order to harness the potential of (Gen)AI to enhance teaching, learning, assessment and research – and to be prepared for future challenges as these technologies evolve. We also commit to providing ongoing resources and guidance to support students and staff to use AI and GenAI in ways that are appropriate, responsible and ethical – and to ensure that academic integrity is maintained in its usage.

College aspires to develop best practice guidelines in this area. In addition to the resources and supports that College provides and recognising that appropriate uses of AI and GenAI tools vary across academic disciplines, Schools will have some flexibility to customise their own discipline-specific practices in line with this institutional statement, other institutional policies as they develop, and national and international regulation. The College goal is to enable overall consistency in the regulation of GenAI usage, while also respecting where disciplines or degree programmes require specific restrictions in GenAI usage in assessment preparation and execution. Thus, where disciplines or degree programmes wish to refine specific regulations on student use of GenAI for learning, general as well as programme-specific regulations should be communicated in the relevant discipline/degree programme handbook.

Such regulation could range from how student GenAI usage is acknowledged or cited within student assessment submissions, to prohibition of GenAI usage in the production of student assessment submissions.

TR062: Geography and Geoscience - BA Mod in SCIENCE (GEOGRAPHY)

Geography is fundamentally interdisciplinary. It encompasses very different ways of knowing, from the natural and social sciences and the humanities. A major intellectual task within the subject is to encompass this diversity of contexts and the different types of knowledge that are characteristic of the study of the Earth's physical environments, human societies and the interactions between the two. Geographers can take a global view but are able to inter-relate global and local perspectives. Geographers are aware of the relevance of geographical concepts, techniques and expertise to problem solving, wealth creation, poverty reduction and improving the quality of life and well-being. This is currently relevant in the context of climate change, urban and rural planning, hazard assessment, sustainability and environmental management.

Geography Learning Outcomes
On successful completion of your Geography degree, you will be able to:

- Demonstrate a coherent geographical understanding of trends, processes and impacts which shape global environments and/or societies at different spatial and temporal scales.
- Demonstrate an understanding of Geography as an academic discipline, including awareness of its theories, concepts, history, methods, processes and principal subfields.
- Apply geographical thought creatively, critically and appropriately to specific spaces, places and/or environments.
- Demonstrate competence in the use of the diversity of techniques and approaches involved in collecting and analysing geographical information.
- Critically reflect on the accuracy, precision and uncertainty of research data
- Demonstrate critical insight of the complexity of the reciprocal relationships between physical and human environments.
- Recognise, evaluate and synthesize various views, arguments and sources of knowledge pertinent to solving environmental and social problems.
- Resolve geographical questions by ethical means, applying evidence-based knowledge and appropriate research techniques, including those associated with field work.
- Communicate geographical perspectives and knowledge effectively to specialist and non-specialist audiences using appropriately selected written, oral and visual means.
- Contribute effectively as a member or leader of diverse teams working in geographical or multidisciplinary contexts.

TR062 Geography Junior Sophister Programme

Geography Course Coordinator – Dr Margaret Jackson

TR062 Science (Geography) – Junior Sophister Year	
Semester 1 (S1)	**Semester 2 (S2)**
MANDATORY CORE MODULES (40 Credits)	
GGU33002 Residential Field Course 1 (10 Credits)	GGU33003 Residential Field Course 2 (10 Credits)
GGU33933 Geographical Information: Data & Tools (5 Credits)	GGU33928 Advanced Research Methods in Geography 1 (5 Credits)
GGU33014 Research Frontiers in Geography (5 Credits)	GGU33011 Earth's Climate Past, Present and Future (5 Credits)
GGU33020 Research Skills and Data Analysis in Geomorphology 1 (5 Credits)	GGU33021 Research Skills and Data Analysis in Geomorphology 2 (5 Credits)
Trinity Elective (5 credits) + THREE Open Modules (15 credits)	
Trinity Elective (S1) (5 Credits)	**Trinity Elective (S2) (5 Credits)**
GGU33939 Exploring the Sustainable City (5 Credits)	GGU33931 Environmental Governance 1 (5 Credits)
GGU33937 Urban Economic Structure & Regeneration (5 credits)	GLU33007 Earth Resources for a Critical Future (5 Credits)
BOU33123 Soil Science (5 Credits)	GGU33915 Globalisation and Geopolitics (5 credits)
GSU33003 Ice Age Earth (5 Credits)	GGU33019 Economy, Finance and Space (5 credits)
GLU33002 Blue Earth: Understanding the Function of Marine Ecosystems (5 Credits)	GLU33009 Hydrology and Groundwater Quality (5 Credits)
GLU3304 The Crystal World (5 credits)	GLU33005 Volcanism and Magmatism (5 Credits)

Junior Sophister Geography Core Modules (Mandatory)

GGU33002 Residential Field Course 1 **10 Credits**
Module coordinator: Dr Mary Bourke
Note: You must select **EITHER** GGU33002 **OR** GGU33003 (**you may not select both**).

This module will run from the Friday evening of Week 6 in Semester 1 (to fly overseas) through the full Week 7 Reading Week**. Note that due to the cost of airfare this module is more expensive than the alternative module GGU33003.** However, there are additional costs required for both modules.

This field trip will introduce students to specific examples that illustrate the interplay between human society and the environment in an overseas location (e.g., Mallorca). During the trip, key themes will be explored on set days, with student introduced to specific geographical research skills that will allow them to gain confidence in carrying out their own independent geographical research project. These skills include a range of transferrable skills (team working, project framing, planning, execution, and data analysis) alongside specific human and physical geography data acquisition methods and techniques, such as may be required for capstone projects. Prior to departure, students will be issued with background materials to familiarise themselves with the geographical setting and its human and physical environmental past and present.

Detailed information on travel and accommodation will be issued prior to the trip. Students are expected to attend briefing sessions as requested in which the general field setting, and several themes will be introduced that will be explored in depth during the trip. These sessions will also take students through the logistics, ethical, and health and safety considerations of taking part.

Assessment: Course work (100%)

GGU33003 Residential Field Course 2
Module coordinator: Dr Mary Bourke **10 Credits**
Note: You must select EITHER GGU33003 OR GGU33002 (**you may not select both**).

This module will run from the Friday evening of Week 6 in Semester 2 (to travel to the field) through the Week 7 Reading Week. Note that this module is less expensive than the alternative module GGU33002 as there are no international flights, etc., required. However, there are additional costs required for both modules.

This field trip will introduce students to specific examples that illustrate the interplay between human society and the environment in an Irish setting. During the trip, key themes will be explored on set days, with student introduced to specific geographical research skills that will allow them to gain confidence in carrying out their own independent geographical research project. These skills include a range of transferrable skills (team working, project framing, planning, execution, and data analysis) alongside specific human and physical geography data acquisition methods and techniques, such as may be required for capstone projects.

Prior to departure, students will be issued with background materials to familiarise themselves with the geographical setting and its human and physical environmental past and present. Detailed information on travel and accommodation will be issued prior to the trip.

Students are expected to attend briefing sessions as requested in which the general field setting, and several themes will be introduced that will be explored in depth during the trip. These sessions will also take students through the logistics, ethical, and health and safety considerations of taking part.

Assessment: Course work (100%)

GGU33933 Geographical Information: Data & Tools (S1) **5 Credits**
Module coordinator: Dr John Connolly
This module explores how to identify, create and use geographic data and tools. The object is to teach students how data are constructed, used, found, and manipulated by geographic researchers. The module will enable students to interpret maps; find and evaluate data; organise, manipulate and analyse data in statistical packages and GIS; create projects and maps using GIS; identify how geographic data construction and analysis differs from typical quantitative approaches.

Assessment: Course work (100%)

GGU33014 Research Frontiers in Geography (S2) **5 Credits**
Module coordinator: Dr Anna Davies
Geographical research is at the forefront of understanding the world around us in relation to nature-society interactions, spatial processes, and matters of space and place. This module will help students refine their ability to understand and interpret research from across the discipline of geography, as well as supporting them to develop evidence-based opinions about this research and assisting them to identify how they can help to push frontiers forward through their own research.

Following introductory lectures on the research process, the module will comprise a series of invited presentations from geography researchers on a recently published paper, chapter or report with student-led discussions about the research process and findings. Students will critically analyse each presentation with respect to the core elements of the research process: problem identification, existing state of knowledge, methodology, analysis, results, and conclusions and reflect on the key challenges and opportunities for geography at the frontier of global challenges in the 21st Century.

Assessment: Course work 100%

GGU33020 Research Skills and Data Analysis in Geomorphology 1 (S1) 5 Credits
Module coordinator: Dr Margaret Jackson
Earth's surface is constantly changing. Understanding how and why these changes occur is a key skill for those across the Earth Sciences, from physical and human geographers to geo- and environmental scientists. Being able to communicate one's observations and understanding of our planet's surface is likewise a crucial competency. In this module, we will take a wide-angle view of Earth-surface forms and processes and use these concepts as our gateway to exploring and practicing key skills in the field. These skills include the use, interpretation, and creation of topographic and geomorphic maps. We will also investigate methods used to date earth surface landforms and processes.

This module relies heavily on hands-on activity and skill practice in addition to traditional classroom lectures and discussion. This module also introduces key skills for students undertaking independent Capstone projects in their fourth year and is a natural lead-in to the module 'Research Skills and Data Analysis in Geomorphology 2' in semester 2.

Assessment: Course work (100%).

GGU33928 Advanced Research Methods in Geography (S2) 5 Credits
Module coordinator: Dr Iris Moeller
This module helps students develop the research skills required to plan and undertake their final year 'Capstone Project' in Geography. The module focuses on approaches to solving geographic problems, although topics such as ethics, integrity, professionalism, philosophy, research project design, and presentation skills are also covered. Some preparatory work (e.g. project selection) may be required prior to the start of this module, details of which will be circulated at the start of the academic year.

Assessment: Course work (100%)

GGU33011 Earth's Climate: Past, Present and Future (S2) 5 Credits
Module coordinator: Dr Margaret Jackson
In this module we will investigate Earth's climate system, how it operates, and how it changes over time (and why). In doing so we will explore not only the climate we observe today, but also how climate has changed in the past. With this understanding in hand, we will go on to examine projections for future climate change and what impact these potential changes may have on our lives and communities. This module will use readings, activities, and discussion to explore the mechanisms that influence climate over time, in the past, present, and future.

Assessment: Course work (100%)

GGU33021 Research Skills and Data Analysis in Geomorphology 2 (S2) 5 Credits
Module coordinator: Dr Margaret Jackson
Earth's surface is constantly changing. Understanding how and why these changes occur is a key skill for those across the Earth Sciences, from physical and human geographers to geo- and environmental scientists. This module focuses on the role of water in the evolution of Earth's landscape. Though investigating fluvial processes and sediment transport, students will gain first-hand experience in constructing simple models to help them estimate the rate and magnitude of surface processes. Students will also practice sediment classification, quantitative problem solving, and map making.

This module relies heavily on hands-on activity and skill practice in addition to traditional classroom lectures and discussion. This module also introduces key skills for students undertaking independent Capstone projects in their fourth year and is a natural continuation of the module 'Research Skills and Data Analysis in Geomorphology 1' in semester 1.

Assessment: Course work (100%).

Junior Sophister Geography Open Modules (Optional)

Students are required to take either **TWO** or **THREE** 'open' modules from the TR062 Geography programme depending on the number of Trinity Electives they select to undertake (See 'Trinity Electives' for further details). Module outlines are presented below along with a series of illustrative pathways that may be useful when considering your choice of open modules.

Other module combinations are available, but students are advised to consider module prerequisites carefully when making their selections. Further advice on module choice will be available at the TR062 Sophister Information Session.

Pathways A and B are suitable for a student considering undertaking a **human geography capstone project.**

<table>
<tr><th colspan="2">TR062 Geography (Pathway A)</th></tr>
<tr><th>Semester One (S1)</th><th>Semester Two (S2)</th></tr>
<tr><td>Trinity Elective</td><td rowspan="2">Any two from:
GGU33915 Globalisation and Geopolitics
GGU33019 Economy, Finance and Space
GGU33931 Environmental Governance 1</td></tr>
<tr><td>GGU33939 Exploring the Sustainable City
OR
GGU33937 Urban Economic Structure and Regeneration</td></tr>
</table>

TR062 Geography (Pathway B)	
Semester One (S1)	**Semester Two (S2)**
Trinity Elective	Trinity Elective
GGU33939 Exploring the Sustainable City **OR** GGU33937 Urban Economic Structure and Regeneration	GGU33915 Globalisation and Geopolitics **OR** GGU33019 Economy, Finance and Space **OR** GGU33931 Environmental Governance 1

Pathways C and D are suitable for a student considering undertaking a **physical geography capstone project.**

TR062 Geography (Pathway C)	
Semester One (S1)	**Semester Two (S2)**
Any two from: • GLU33002 Blue Earth: Understanding the Function of Marine Ecosystems • GSU33003 Ice Age Earth • BOU33123 Soil Science • GLU33004 The Crystal World	Trinity Elective
	GLU33009 Hydrology and Groundwater Quality **OR** GLU33007 Earth Resources for a Critical Future **OR** GLU33005 Volcanism and Magmatism

TR062 Geography (Pathway D)	
Semester One (S1)	**Semester Two (S2)**
Trinity Elective (5 credits)	Trinity Elective (5 credits)
Any one from: • GLU33002 Blue Earth: Understanding the Function of Marine Ecosystems • GSU33003 Ice Age Earth • BOU33123 Soil Science • GLU33004 The Crystal World	GLU33009 Hydrology and Groundwater Quality **OR** GLU33007 Earth Resources for a Critical Future **OR** GLU33005 Volcanism and Magmatism

Semester 1

GGU33939 Exploring the Sustainable City (S1) **5 Credits**
Module coordinator: Federico Cugurullo
What will the city of the future look like? To what extent are our models of city-making sustainable? Is the road that we are taking leading us towards an environmental utopia in which societies will grow in balance with nature, or are we paving the way for the collapse of our civilization?

In this highly interdisciplinary module, we are going to use the tools of geography to examine the most critical socio-environmental issues faced by cities (climate change, consumption, happiness, environmental degradation, etc.), and discuss both the theory and practice of urban sustainability.

This module is more than a review of how urban sustainability is understood and practiced, and you will be asked to design, present and discuss practical plans of action to sustain urban living in the 21st century and beyond.

Assessment: Course work (100%)

GGU33937 Urban Economic Structure & Regeneration (S1) **5 Credits**
Module coordinator: Cian O'Callaghan
This module introduces you to some key themes, concepts, and debates in urban geography. In particular it will focus on the concept of urban regeneration. The module first considers the historic development of urbanisation, the transition to urban-based economies, and the development of urban studies. It then focusses specifically on the urban impacts of globalisation, in particular how cities in the developed world have managed the shift from industrialism to post-industrialism.

Finally, the module examines regeneration from a number of perspectives. Particular attention will be given to the circular nature of processes of urban growth and decline and how regeneration efforts include and exclude particular social groups and identities.

Assessment: Course work (50%); end of semester examination (50%).

BOU33123 Soil Science (S1) **5 Credits**
Module coordinator: Dr Matthew Saunders
Soils are important for plants as they provide the key resources required for growth and also essential structural support. This module will provide an overview of the fundamental concepts of soil formation and characterisation; how soil characteristics influence plant distribution and productivity through water and nutrient availability; how soil organisms (bacteria, fungi) interact with plants and how soils influence global biogeochemical cycles (carbon and nitrogen). Particular focus will be given to the role of soils in the production of food, fuel and fibre and how sustainable land management practices are required to ensure the long-term health and fertility of soil systems.

Assessment: Course work (50%); end of semester examination (50%).

GSU33003 Ice Age Earth (S1) **5 Credits]**
Module coordinator: Robin James Edwards
The last 2.6 million years of Earth history have witnessed dramatic climatic and environmental changes. This module provides an overview of these major environmental changes, their causes, and their significance for human development. It contrasts 'glacial' and 'interglacial' worlds, examines the nature of the transitions between them, explores some potential causes of change, and illustrates their environmental impacts. In the process, a range of key environmental records are considered, along with the "proxies" used to develop them.

Assessment: Course work (50%); end of semester examination (50%).

GLU33004 The Crystal World (S1) **5 Credits**
Module coordinator: Dr Juan Diego Rodriguez-Blanco
Minerals are solid chemical compounds that occur naturally, but sometimes can also be synthesised in the laboratory. They are the fundamental building blocks of rocks, also a major component of all soils, and are needed as raw materials because they are the ultimate source of many essential elements used in industrial processes. This module provides an overview of the main characteristics of minerals from a chemical and structural point of view, as well as their formation and transformation process and the factors affecting their crystallisation and chemical variability. It also focuses on the identification and characterisation of the 10-top rock-forming minerals using the petrographic microscope.

Assessment: Course work (50%); end of semester examination (50%).

GLU33002 Blue Earth: Understanding the Function of Marine Ecosystems (S1) 5 Credits
Module coordinator: Dr Carlos Rocha

This is an introductory course in marine biogeochemistry. The ocean plays a central role in Earth's climate system, and marine biogeochemical processes regulate the impact of human activity on the global environment. Marine biogeochemistry hence provides a working knowledge of how the earth system functions and reacts to human activity, providing insights into how life formed, evolved, is sustained, and is endangered on Earth. This knowledge provides an understanding of how to adapt to climate and environmental change, enhance food production, manage fisheries and aquaculture, mitigate pollution, and innovate by developing new products including more sustainable food and decarbonation technologies. This module concentrates on the marine biogeochemical phenomena that regulate the earth's climate and control the diversity, distribution, and productivity of marine life.

Topics covered include the physical, biological, geological, and chemical processes that control the creation, distribution, and fate of organic matter in the marine environment, the composition of seawater and the atmosphere, and the formation and preservation of marine sediments. The course will prepare students for related courses, field and laboratory work in the marine, earth, and environmental sciences and careers in the marine & environmental sector.

Assessment: Course work (100%)

Semester 2

GGU33931 Environmental Governance 1 (S2) 5 Credits
Module coordinator: Rory Rowan

Despite growing awareness of the many forms of environmental degradation, the political and societal response has been far from adequate. How can we explain this? One starting point is to interrogate the contested history and development of environmental politics since the 1960s. This historically informed understanding invites us to consider how re-framing current environmental problems may help us to orientate society towards a more just and sustainable future.

This module will introduce students to the emergence of environmental politics as a unique field of policymaking, scientific production, and conflict since the 1960s. It will discuss key texts, writers and thinkers, whose work has been instrumental in shaping how we think about the environment, as well as how private, public and civil society actors have responded to environmental problems in recent times.

Assessment: Course work (100%)

GLU33007 Earth Resources for a Critical Future (S2) **5 Credits**
Module coordinator: Dr Sean Mc Clenaghan
Decarbonization of society's energy infrastructure will involve a significant shift from fossil fuel extraction to the mining of "energy minerals" for the fabrication of green energy infrastructure. This module introduces students to a wide range of mineral deposits with an emphasis placed on raw materials critical to energy conservation, transport, and infrastructure. Students will gain a broad understanding of earth resources and important occurrences of mineral deposits in the Earth's Crust. The students will become familiar with the environments in which various ore resources and critical elements form as well as the implications for exploration, assessment and recovery of critical raw materials for a decarbonized society. Raw materials will be practically studied through thin section petrography, advanced micro-analysis, hand specimens and exploration drill core as well as field excursions to local mineral deposits in Ireland. Assessment of mineralization based on mineralogy and geochemistry, presence of known critical elements, precious metals and deleterious elements are addressed throughout the module.

Upon successful completion of this module students will be able to assess mineralization and identify favourable terranes for the concentration of critical raw materials. Students will also be able to analyse economic factors controlling the viability of raw materials and devise strategies for the exploration and recovery of a mineral resource.

Assessment: Course work (40%); end of semester examination (60%).

GGU33915 Globalisation & Geopolitics (S2) **5 Credits**
Module coordinator: Dr Padraig Carmody
This module examines the impacts of globalisation in both the developed and developing world and its relation to geopolitics. Particular emphasis is placed on the theories of geopolitics and globalisation and topics covered include the implications of the rise of China and its international relations in the developing world, "shadow globalisation" – human, arms and drug trafficking and resistance to these processes through social movements, amongst others.

Assessment: Course work (50%); end of semester examination (50%).

GGU33019 Economy, Finance and Space (S2) **5 Credits**
Module coordinator: Dr Martin Sokol
Outline: Why do some economies grow faster than others? Why is there so much inequality? Why do economies crash? What is the role of finance in contemporary capitalism? Is economic growth sustainable? What policy options are there to shape our economic systems? These are some of the questions explored by this module. To help address them, Economy, Finance & Space provides students with key insights into economic and financial geography. It highlights the ways in which economic and financial processes both shape, and are shaped by, space. In particular, the module focuses on understanding how uneven development occurs, alongside exploring questions of how social inequalities arise and what causes economic and financial crises.

In addition to this, the impacts of economic and financial processes on the environment and the climate crisis are considered. In doing so, the module engages with fundamental challenges facing contemporary societies and explores policy options to address them.

Students will gain a solid grounding in a number of theoretical approaches, concepts and debates pertaining to the economy, finance & space; will explore economic and financial processes in the real world through case studies from a range of different contexts, including those in the Western capitalist core and (semi-)peripheries of post-socialist Eastern Europe; and will debate policy options for the future.

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

- Comprehend and explain key concepts and theoretical approaches in economic and financial geography.
- Discuss and critically evaluate these concepts and theoretical approaches.
- Apply these concepts and approaches to real world economic and financial processes.
- Describe and discuss key challenges facing contemporary capitalist economies, their causes and consequences.
- Critically reflect on, and discuss, policy options for overcoming inequality and uneven development in the contemporary world.

Module Breakdown:
Lectures, seminars, student presentations & debates, in-term assignments and site visits.

Contact hours:
22 hrs; Additional input: independent study (preparation for course and review of materials): 50 hrs; independent study (preparation for assessment, incl. completion of assessment): 53 hrs.

Assessment: Course work (100%)

GLU33009 Hydrology and Groundwater Quality (S2) 5 Credits
Module coordinator: Dr Eyad Abushandi
This module aims to provide students with an understanding of hydrological processes, following the different pathways of water through the terrestrial part of the hydrological cycle. It also aims to familiarise students with the factors affecting groundwater quality, and to develop an understanding of groundwater quality issues in the context of integrated catchment management.

The hydrology component of this module includes the following topics: the hydrological cycle and catchment water balances; rainfall and evapotranspiration; soil water and hillslope hydrology; river flow; hydrogeology; groundwater – surface water interaction. The groundwater quality component includes groundwater chemistry and natural groundwater quality problems; groundwater quality issues in rural and industrial settings; groundwater vulnerability and protection. The interaction of groundwater and surface water quality is also considered.

Assessment: Course work (30%); end of semester examination (70%).

GLU33005 Volcanism and Magmatism (S2) **5 Credits**

Module coordinator: Dr Emma Tomlinson

This module explores the origin, evolution and emplacement of magmas and the effect of magmatic and volcanic processes on society and the environment. The module provides an overview of the most important igneous rocks at a range of scales (tectonic setting, outcrop, hand specimen and thin section) through investigations of thin section and hand samples, videos and analogue experiments.

Prerequisites: We recommend that students planning to take this module also take GLU33004, The Crystal World

Assessment: Coursework (60%); end of semester examination (40%)

TR062 Geography Senior Sophister Programme

Senior Sophister Course Coordinator – Dr Margaret Jackson

TR062 Science (Geography) – Senior Sophister Year	
Semester 1 (S1)	**Semester 2 (S2)**
MANDATORY CORE MODULE (25 Credits)	
GGU44930 Geography Dissertation (20 Credits)	
GGU44933 GIS and Remote Sensing Applications in Geography (5 Credits)	
OPTIONAL OPEN MODULES (35 Credits – Max. 20 Credits per Semester)	
BOU44111 Restoration Ecology and Rewilding (5 Credits)	GGU44979 Living on the Edge: Estuaries and Coasts (5 Credits)
GLU44009 Geoscience for a Sustainable Planet (5 credits)	GGU44936 Globalisation and African Development (5 Credits)
GGU44976 Glaciers & Glaciation (5 credits)	GGU44902 Karst Landscapes (5 Credits)
GGU44978 Finance and Climate Justice (10 credits)	GGU44968 Historical Geography (10 Credits)
GGU44903 Carbon and Climate: How the Carbon Cycle Controls our World (5 credits)	GGU44927 Environmental Governance 2 (5 Credits)
GGU44901 Natural Hazards (5 credits)	
GLU44011 Palaeoceanography and Palaeoclimatology (5 Credits)	
GLU44012 Raw Materials in Building (5 Credits)	

Senior Sophister Geography Core Module (Mandatory)

GGU44930 Geography Dissertation (Annual) **20 credits**

Module coordinator: Dr Iris Moeller

The dissertation is an independent, individual research project in which field work, or the study of original source material is expected to play an important role. Students experience the entire research process, from framing the enquiry to communicating findings in the form of a dissertation. It is a test of a student's ability to negotiate the challenges of research design, project execution and dissertation writing. Specific research topics will be based on the current academic staff expertise in Geography (e.g., from the geographies of online media to nature-based solutions to coastal erosion). Data can be collected in a variety of ways - such as through field sampling or survey, satellite, drone or airborne remote sensing, laboratory analysis, questionnaire surveys, interviews, content analysis, census material or archival work or some combination of these - depending on the topic chosen.

Assessment: Course work (100%)

GGU44933 GIS and Remote Sensing Applications in Geography (S1) **5 Credits**

Module coordinator: Dr John Connolly

Remote Sensing and Geographical Information Systems (GIS) allow a wide range of environmental and human phenomena to be explored across space and time. The ability to detect and map change within the human and physical/environmental sub-systems at a range of scales has the power to inform science, policy, and planning and often becomes essential when scaling up observations / theories derived within a particular place or at a particular time. In this module, students will learn both the theory behind GIS and Remote Sensing techniques, exploring a range of web-based and stand-alone methods for interrogating geo-spatial data. They will be encouraged to do so critically and will gain an understanding of uncertainties and the relative merits of different sources of geospatial information, with particular emphasis placed on resolution and accuracy, both spatially, temporally, and in the spectral domain.

The module contains an appropriate amount of hands-on learning, both within the classroom and in students' own time via accessible web-based platforms/software.
Prerequisites: GGU33933

Assessment: Course work (100%)

Senior Sophister Geography Open Modules (Optional)

Students select **40 credits** of open modules during their Senior Sophister year (20 credits each Semester). Module selection may be limited by prerequisites or quotas.

Semester 1

BOU44111 Restoration Ecology and Rewilding (S1) **5 Credits**
Module coordinator: Marcus Collier
Restoration ecology, like conservation biology, is a 'crisis' discipline, having emerged as a scientific response to the ecological damage caused by human activities. Restoration ecology has many positive outcomes but has also a lot of controversy. Re-wilding and novel ecosystems are new, daring 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 and the work of restoration ecologists. It will look at how re-wilding could be the best nature-based solution and how novel ecosystems could be the worst. As the discipline struggles to include social sciences, politics and economics, this module will draw on case studies of restoration globally that will challenge students to rethink ecology and ecosystems in the Anthropocene.

Students will also visit an abandoned industrial landscape and look at the after-use and restoration processes.
Prerequisites: None. Places on this module may be limited.
Assessment: Course work (50%), end of semester examination (50%)

GLU44009 Geoscience for a Sustainable Planet (S1) **5 Credits**
Module coordinator: Dr Quentin G Crowley
Geoscience has a crucial role to play in implementing the Sustainable Development Goals (SDGs). In fulfilling a global strategy to achieve a more sustainable future for all, the role of Earth subsystems needs to be clearly mapped onto the SDGs. In the past, lack of a geoscience overview resulted in unsustainable development and several undesirable knock-on effects. For instance, the high energy output from combustion of fossil fuels was instrumental in development of key technologies as part of the industrial revolution and advancement of society. We now realise however, that large-scale utilization of fossil fuels led to the unintended consequence of increased greenhouse gas emissions and climate disruption on a planetary scale. Whereas climate-change is unequivocally one of the greatest challenges faced by society today, there are also new opportunities for geoscience to contribute to climate adaptation and mitigation strategies. For instance, with the phasing out of fossil fuels there is now a new demand for raw materials to support the transition to renewable energy.

Additionally, geoscience knowledge specifically developed for petroleum exploration now underpins carbon capture and storage technologies. In other areas, integration of geoscience knowledge is crucial for sustainable agriculture and food production.

This module will explore various ways in which geoscience not only supports the SDGs, but also underpins global sustainable development across several sectors and systems.

Assessment: Course work (40%); end of semester examination (60%).

GGU44976 Glaciers and Glaciation (S1) **5 Credits**
Module coordinator: Dr Margaret Jackson
Glaciers mould landscapes and mountain ranges, leaving indelible impressions long after they disappear. Glaciers also provide vital information regarding past climate, serving both as proxies and archives of past conditions. At the same time, the sensitivity of glaciers to changing climate conditions has direct implications for global sea level. Glaciers also provide water resources for billions of people in sub-tropical regions and are a backbone of many tourist economies. Understanding glaciers, how they behave and the impacts they have on landscapes, is therefore crucial for understanding the history of our planet and for projecting future change. Through hands on activities, lectures, and discussion, this module explores how glaciers operate, their effects on landscapes over time, and the influence of glaciers in communities today. We will also investigate how glaciers can serve as indicators of past – and present – climate change.

Assessment: Course work (100%)

GGU44978 Finance and Climate Justice (S1) **10 Credits**
Module coordinator: Dr Martin Sokol
This module examines finance and climate justice, and the links between them. As the worsening climate chaos threatens the very existence of humanity, it is increasingly clear that a climate justice approach is needed for both climate change mitigation and adaptation. Climate justice approaches emphasise the need for a fundamental transformation of society and the economy, while applying the principles of social justice and economic equity. However, there is a growing realisation that such a socio-economic transformation will not be possible without radical changes in the sphere of finance. Going beyond the proposition that finance needs to be mobilised to fund 'green' transition, this module examines the view that the entire global financial architecture must be transformed to safeguard a better, healthier, more stable and a more just future for all. Special attention is given to central banks and their role in the financialised economic system, their relation to climate change and their role in hampering and/or promoting climate justice. Alternative economic and financial models, including de-growth and post-growth approaches, will be examined.

The module also highlights a critical role of geography in understanding both the climate justice issues and the operation of finance in capitalist economies. In line with the principles of climate justice, the module offers students the opportunity to co-design its elements, while also promoting students' climate activism, self-learning and self-reflection.

Assessment: Course work (100%)

GGU44903 Carbon and Climate: How the Carbon Cycle Controls our World (S1) 5 Credits
Module coordinator: Dr Margaret Jackson
When it comes to the stability of life on Earth, one might say that the carbon cycle can be more dangerous than an asteroid. Today, as humans add ever increasing amounts of carbon to our atmosphere and global temperatures rise in turn, rapid anthropogenic climate change places stress on ecosystems and human infrastructure alike. But to truly understand the role of carbon in our world we must look to our past. We can examine how the Earth has responded to past carbon cycle change and look to these periods for lessons for both our present and our potential future.

This module will focus on Earth's carbon cycle today and will contextualise changes in our modern carbon and climate systems through comparisons with carbon-cycle change in Earth's past (both its causes and consequences).

Students will gain understanding of the science of carbon and its links to the climate system. Students will also learn more about the wider research process through readings which highlight the process of scientific debate and discovery.

Assessment: Course work (100%)

GGU44901 Natural Hazards (S1) 5 Credits
Module coordinator: Dr Mary Bourke
Short-lived, high magnitude extreme events, from meteorite impacts, to volcanic eruptions, fire, and storms, have shaped the surface of the earth throughout its geological history. Increasing population densities in critical locations on our planet (e.g. cities at the foot of volcanoes, on tectonic fault lines, and at the coast) and human impacts on the environment at the local, regional and global scale, however, have altered the likelihood and magnitude of certain types of natural hazards. This has brought the vulnerability of societies to natural hazards into sharp focus over recent decades. In October 2020, the UN Office on Disaster Risk Reduction (UNDRR) reported that, over the past two decades, 1.23 million people had lost their lives in a total of 7,348 'disaster events' that had been recorded globally (with floods (40% of occurences), storms (28%), earthquakes (8%), and extreme temperatures (6%) as the four most impactful types of hazard).

In our efforts to reduce the human and economic impact of such events, an understanding of the reasons for their occurrence, their spatial and temporal variability, the degree to which they are 'natural' as opposed to 'anthropogenic' as well as past and potential future societal responses to such events is critical.

This module will address all of the above elements beginning with an introduction to 'natural' hazards and general concepts or risk and vulnerability. The introductory lectures are then followed by lectures and targeted reading and supporting discussion groups. Finally, we will explore case studies highlighting past, present, and potential future societal solutions for the mitigation of the impact of natural hazards with guest speakers bringing to this module an applied natural hazard and risk management perspective.

Assessment: Course work (100%)

GLU44011 Palaeoceanography and Palaeoclimatology (S1) **5 Credits**
Module coordinator: Dr Gerald Dickens
In the past 250 million years Earth has experienced significant physical, chemical and biological changes of the atmosphere, oceans and terrestrial environments; leading up to the planet that we live on today. How did this little blue planet evolve over that time, and how have we figured out its amazing history? In this course we will study the gradual long-term evolution of Earth, on land and in the oceans, and how this was interrupted by extreme global change events such as global mass extinctions, oceanic anoxic events, hyperthermals, but also more locally the Messinian Salinity Crisis, Pleistocene climate transitions, or the Younger Dryas. We study the forensics on how to constrain Earth's past, and how this helps us to understand the present, and predict the future.

Assessment: Course work (65%); end of semester examination (35%).

GLU44012 Raw Materials in Building (S1) **5 Credits**
Module coordinator: Dr Robbie Goodhue
The module will explore several recent failures in building materials and their legacy, highlighting the need for professional geoscientists in the industry. We explore the types of bulk raw materials and end uses (road dressing, concrete and mortar aggregate, fill, soil) in Ireland, focusing on specified properties and national standards. Basic testing methods and advanced analytical techniques will be covered, along with method and standard development. Predicting the stability of raw materials and the lifespan of the structures they are used in will introduce the topics of site-won material, recycling and alternative green building materials. The quarrying / extraction and processing will be taught with a trip to a working quarry / gravel pit / recycling and site stabilisation site.

Assessment: Course work (30%); end of semester examination (70%).

Semester 2

GGU44979 Living on the Edge: Estuaries and Coasts (S2) **5 Credits**
Module coordinator: Dr Iris Moeller
Coastal regions are some of the most dynamic on Earth, not least because human and natural processes act in tight connection to each other. This dynamism poses one of the great societal challenges of the 21st Century: as coastal populations are increasing at three times the global rate, they are also experiencing an increasing threat of coastal flooding and erosion under climatic extremes (e.g. tropical and extratropical storm surges), and are 'locked into' accelerated sea level rise for centuries to come. Building upon a basic, foundational knowledge of ocean and coastal processes covered in relevant modules within the first and second year ('Spaceship Earth' and 'Physical Geography: Dynamic Earth'), students will gain wide ranging theoretical and practical skills required to address those challenges.

The lectures and seminars take students on a journey that highlights how the natural processes operating within estuaries and on coasts are a function of external factors (past and present climate, geology, human influences) and feedbacks in which the landforms

themselves affect the operation of processes that shape the landforms. Equipped with this knowledge, and several examples from around the world, students will put their knowledge into practice. A day-field trip and practical exercise will challenge students to apply what they have learnt to real-world coastal management problems. Working in groups, they will form 'coastal management consortia' that will navigate their way through the stages of problem definition to data acquisition and development of appropriate coastal management solutions.

The assessed practical exercise will develop and enhance team-working, independent research, critical thinking, scientific and applied writing, and presentation skills.

Assessment: Course work (100%)

GGU44936 Globalisation and African Development (S2) 5 Credits
Module coordinator: Dr Padraig Carmody
This module explores the nature and impact of globalisation in Africa. Particular attention is paid to the geography of HIV/AIDS, gender and development, China's rising role in the continent, oil politics and the so called "resource curse". Other topics covered include gender and the mobile phone revolution.

Assessment: Coursework (50%); end of semester examination (50%).

GGU44902 Karst Landscapes (S2) (5 Credits)
Module coordinator: Dr Pete Akers
The dissolution of limestone and other carbonate bedrocks produces unusual landscapes dominated by underground drainage. Globally, these carbonate rocks underlie 12–20% of the Earth's land surface that support a quarter of the world population. When these bedrocks are exposed at the surface, dissolution carves a distinctive topography known as karst. Karst landscapes are known for their scenic mixture of peculiar landforms which include sinkholes, disappearing streams, turloughs, and caves. Karst and limestone aquifers are an important source of domestic and industrial water for billions, and the distinct hydrology of karst produces unique ecosystems and high biodiversity. However, the environmental properties that set karst apart from other landscapes also make it vulnerable to human mismanagement and pollution. Proper stewardship of limestone landscapes requires us to understand how they differ from other, better known landscapes, and this is particularly important for Ireland, which has over 40% of its land underlain by limestone. For students interested in protecting Irish water and biodiversity resources, including those at some of Ireland's most distinctive landscapes such as the Burren, this module provides the foundational understanding of karstic geomorphology, hydrogeology, and geochemistry for future success when operating in such environments.

Assessment: Course work (100%)

GGU44968 Historical Geography (S2) **10 Credits**

Module coordinator: Dr Mark Eugene Hennessy

This module presents an overview of the historical geography of Ireland from the earliest evidence of human settlement in the Mesolithic through to c.1840 A.D. Throughout the module developments in Ireland are set within appropriate comparative and theoretical contexts. The principal topics explored are settlement, land use and agriculture, the changing environment (including human impacts), patterns of cultural variation and interaction and how these have come together to forge changing landscapes and regions.

Assessment: Course work (50%); end of semester examination (50%).

GGU44927 Environmental Governance 2 (S2) **5 Credits**

Module coordinator: Dr Rory Rowan

This module introduces students to the interdisciplinary field of political ecology; political ecology seeks to better understand the complex drivers and uneven consequences of socio-environmental change. The module will provide students with the conceptual and methodological tools to carry out critical, independent research on an environment-related topic. The objective of the course is for students to come away with a critical "toolkit" for thinking, writing, and acting on complex social and ecological problems in Ireland and elsewhere. It is also hoped that the research carried out by the students will provide valuable and critical insights for a wider audience interested in environmental issues in Ireland.

Prerequisites: GGU33931 Environmental Governance 1
Assessment: Course work (100%)

TR062: Geography and Geoscience - BA Mod in SCIENCE (GEOSCIENCES)

Geosciences combine the study of geology, geography, chemistry, physics and biology, to develop a complete understanding of how the earth works (past, present & future). The work of geoscientists helps us understand the changing climate, predict earthquakes and volcanic eruptions, find supplies of energy and raw materials, maintain clean air and water, understand the motion of the earth's crust and oceans, and reconstruct the evolution of rocky planets and life.

Geoscience Learning Outcomes

On successful completion of your Geosciences degree you will be able to:

- Demonstrate a thorough working understanding of the scientific method, the nature of scientific knowledge and its evolution over time.
- Discuss the core principles of Geoscience and apply the scientific method to the study of Geographical and Geological problems.
- Explain the interdisciplinary nature and acquisition of scientific knowledge, illustrating the relationships among geographical and geological sciences and cognate disciplines.
- Formulate and test hypotheses in order to make logical and scientific arguments based on current data.
- Collect qualitative and quantitative data with precision and organisation, using specific geographical and geological technical skills.
- Analyse and critically evaluate data using appropriate mathematical, statistical, computational and other relevant methods.
- Conduct geographical / geological research independently and as part of a team.
- Critically evaluate current and novel concepts and ideas.
- Communicate effectively in written, oral, electronic and social media formats to scientific and non-scientific audiences.
- Discuss the role and influence of scientific knowledge on society and illustrate its application in the geosciences.

TR062 Geoscience Junior Sophister Programme

Geoscience Course Coordinator – Dr Michael Stock

The JS programme comprises **40 credits** of mandatory core modules that are taken by TR062 Geoscience students. Depending on your desired path of 1) Earth Systems Science or 2) Geology, mandatory module requirements will vary between the two pathways. All students are required to select an additional **20 credits** of modules, ensuring that **10 credits** are chosen **in each semester**. Of these 20 credits, at least **5 credits** (one module) must be drawn from the Trinity Elective modules. A student may choose to take an additional 5 credit module from the Trinity Electives but cannot take both modules in the same Semester.

Students are required to take either **TWO** or **THREE** 'open' modules from the TR062 Geoscience programme depending on the number of Trinity Electives they select to undertake (See 'Trinity Electives' for further details).

Important note on selecting a Trinity Elective

Due to the mandatory residential field course, students will be away from College during the last week of Semester two. **Students wishing to take an elective from Semester two should check that their absence from the final week of the module will not impact on assessment**.

TR062 Geoscience Junior Sophister Programme

TR062 Geoscience Earth System Science Pathway Junior Sophister Year	
Semester One	**Semester Two**
CORE MODULES (40 Credits)	
GLU33002 Blue Earth: Understanding the Function of Marine Ecosystems (5 Credits)	GGU33011 Earth's Climate Past, Present and Future (5 Credits)
GLU33006 Stratigraphy: Earth Through Time (5 Credits)	GLU33007 Earth Resources for a Critical Future (5 Credits)
GLU33027 Introduction to Field Survey Skills (5 Credits)	GLU33009 Hydrology and Groundwater Quality (5 Credits)
GSU33003 Ice Age Earth (5 Credits)	GSU33001 Research Methods for Geoscientists (5 Credits)
Trinity Elective (5 credits) + THREE Open Modules (15 credits)	
Trinity Elective (5 Credits)	Trinity Elective (5 Credits)
BOU33123 Soil Science (5 Credits)	GGU33021 Research Skills and Data Analysis in Geomorphology 2 (5 Credits)
GGU33020 Research Skills and Data Analysis in Geomorphology 1 (5 Credits)	GGU33931 Environmental Governance 1 (5 Credits)
GLU33004 The Crystal World (5 Credits)	GLU33005 Volcanism and Magmatism (5 Credits)
GLU33017 Earth Survey: GIS Mapping Methods (5 Credits)	GLU33013 Tectonics & Structural Geology (5 Credits)
	GSU33007 Junior Sophister Geology Field Course (Greece; 10 Credits)

TR062 Geoscience Geology Pathway Junior Sophister Year	
Semester One	**Semester Two**
CORE MODULES (40 Credits)	
GLU33004 The Crystal World (5 Credits)	GLU33005 Volcanism and Magmatism (5 Credits)
GLU33006 Stratigraphy: Earth Through Time (5 Credits)	GLU33008 Metamorphic Rocks and Processes (5 Credits)
GLU33027 Junior Sophister Field Skills (5 Credits)	GLU33013 Tectonics & Structural Geology (5 Credits)
	GSU33007 Junior Sophister Geology Field Course (Greece; 10 Credits)
Trinity Elective (5 credits) + THREE Open Modules (15 credits)	
Trinity Elective (5 Credits)	Trinity Elective (5 Credits)
BOU33123 Soil Science (5 Credits)	GGU33011 Earth's Climate Past, Present and Future (5 Credits)
GLU33002 Blue Earth: Understanding the Function of Marine Ecosystems (5 Credits)	GLU33007 Earth Resources for a Critical Future (5 Credits)
GLU33017 Earth Survey: GIS Mapping Methods (5 Credits)	GLU33009 Hydrology and Groundwater Quality (5 Credits)
GSU33003 Ice Age Earth (5 Credits)	

Junior Sophister Geoscience Semester 1 Modules

BOU33123 Soil Science (S1) **5 Credits**

Elective: Earth System Science/Geology

Module coordinator: Dr Matthew Saunders

Soils are important for plants as they provide the key resources required for growth and also essential structural support. This module will provide an overview of the fundamental concepts of soil formation and characterisation; how soil characteristics influence plant distribution and productivity through water and nutrient availability; how soil organisms (bacteria, fungi) interact with plants and how soils influence global biogeochemical cycles (carbon and nitrogen). Particular focus will be given to the role of soils in the production of food, fuel and fibre and how sustainable land management practices are required to ensure the long-term health and fertility of soil systems.

Assessment: Course work (50%); end of semester examination (50%).

GGU33020 Research Skills and Data Analysis in Geomorphology 1 (S1) 5 Credits
Elective: Earth System Science
Module coordinator: Dr Margaret Jackson
Earth's surface is constantly changing. Understanding how and why these changes occur is a key skill for those across the Earth Sciences, from physical and human geographers to geo- and environmental scientists. Being able to communicate one's observations and understanding of our planet's surface is likewise a crucial competency. In this module, we will take a wide-angle view of Earth-surface forms and processes and use these concepts as our gateway to exploring and practicing key skills in the field. These skills include the use, interpretation, and creation of topographic and geomorphic maps. We will also investigate methods used to date earth surface landforms and processes. This module relies heavily on hands-on activity and skill practice in addition to traditional classroom lectures and discussion.

This module also introduces key skills for students undertaking independent Capstone projects in their fourth year and is a natural lead-in to the module 'Research Skills and Data Analysis in Geomorphology 2' in semester 2.

Assessment: Course work (100%).

GLU33002 Blue Earth: Understanding the Function of Marine Ecosystems (S1) 5 Credits
Core: Earth System Science
Elective: Geology
Module coordinator: Dr Carlos Rocha
This is an introductory course in marine biogeochemistry. The ocean plays a central role in Earth's climate system, and marine biogeochemical processes regulate the impact of human activity on the global environment. Marine biogeochemistry hence provides a working knowledge of how the earth system functions and reacts to human activity, providing insights into how life formed, evolved, is sustained, and is endangered on Earth. This knowledge provides an understanding of how to adapt to climate and environmental change, enhance food production, manage fisheries and aquaculture, mitigate pollution, and innovate by developing new products including more sustainable food and decarbonation technologies.

This module concentrates on the marine biogeochemical phenomena that regulate the earth's climate and control the diversity, distribution, and productivity of marine life. Topics covered include the physical, biological, geological, and chemical processes that control the creation, distribution, and fate of organic matter in the marine environment, the composition of seawater and the atmosphere, and the formation and preservation of marine sediments.

The course will prepare students for related courses, field and laboratory work in the marine, earth, and environmental sciences and careers in the marine & environmental sector.

Assessment: Course work (100%)

GLU33004 The Crystal World (S1) **5 Credits**
Core: Geology
Elective: Earth System Science
Module coordinator: Dr Juan Diego Rodriguez-Blanco
Minerals are solid chemical compounds that occur naturally, but sometimes can also be synthesised in the laboratory. They are the fundamental building blocks of rocks, also a major component of all soils, and are needed as raw materials because they are the ultimate source of many essential elements used in industrial processes. This module provides an overview of the main characteristics of minerals from a chemical and structural point of view, as well as their formation and transformation process and the factors affecting their crystallisation and chemical variability. It also focuses on the identification and characterisation of the 10-top rock-forming minerals using the petrographic microscope.

Assessment: Course work (50%); end of semester examination (50%).

GLU33006 Stratigraphy: Earth Through Time (S1) **5 Credits**
Core: Earth System Science/Geology
Module coordinator: Dr Gerald Dickens
We live on a planet that has evolved dramatically since 4.55 billion years ago (Ga). As known from the geological record, there was little oxygen in the atmosphere until about 2.6 Ga, while equatorial latitudes had thick ice sheets at 650 million years ago (Ma), and greenhouse conditions turned the poles ice free at 100 Ma; life on Earth has adapted accordingly. This module sets the foundation for how to reconstruct the history of our planet, from the samples and techniques employed, through the controversies that remain. It will address the fundamental question of how to constrain geological time, and why this is important to unravel the fundamental processes that control the Earth system.

Assessment: Coursework (50%); end of semester examination (50%)

GLU33017 Earth Survey: GIS Mapping Methods (S1) **5 Credits**
Elective: Geology/Earth System Science
Module coordinator: Dr Sean Mc Clenaghan
The objective of this module is to develop the skills required to plan and execute a geological survey and finished geological map (Capstone Project) using a digital Geographic Information System (GIS). Enrolment in this module is strongly recommended for students undertaking a Geological Survey Capstone project. Students will receive training on GIS platforms such as ArcGIS and QGIS and will be exposed to 3D visualization software for geological modelling.

Assessment: Coursework (100%)

GLU33027 Introduction to Field Survey Skills (S1) **5 Credits**
Core: Earth System Science/Geology
Module coordinator: Dr Christopher John Nicholas
This field course will provide basic field skills to junior sophister students in both Earth System Science and Geology Pathways. In this module students will embark on a 7 day field excursion in Ireland designed to provide first-hand experience of working in common geological contexts. Particular emphasis is placed on the collection and recording of field data, making informed field observations and subsequent interpretation.

Assessment: Coursework (100%)

IMPORTANT NOTE: This module will take place in the **first week of Semester 1**. Students will be required to make a financial contribution to the cost of the trip (currently approximately **€500**, but this may vary depending on inflation, fuel/transport prices, etc). Although there is a College student hardship fund which can be applied for (depending on individual financial circumstances), the costs for this field course usually are borne by the student.

GSU33003 Ice Age Earth (S1) **5 Credits**
Core: Earth System Science
Elective: Geology
Module coordinator: Dr Robin James Edwards
The last 2.6 million years of Earth history have witnessed dramatic climatic and environmental changes. This module provides an overview of these major environmental changes, their causes, and their significance for human development. It contrasts 'glacial' and 'interglacial' worlds, examines the nature of the transitions between them, explores some potential causes of change, and illustrates their environmental impacts. In the process, a range of key environmental records are considered, along with the "proxies" used to develop them.

Assessment: Course work (50%); end of semester examination (50%).

Junior Sophister Geoscience Semester 2 Modules

GGU33011 Earth's Climate: Past, Present and Future (S2) **5 Credits**
Core: Earth System Science
Elective: Geology
Module coordinator: Dr Margaret Jackson
In this module we will investigate Earth's climate system, how it operates, and how it changes over time (and why). In doing so we will explore not only the climate we observe today, but also how climate has changed in the past. With this understanding in hand, we will go on to examine projections for future climate change and what impact these potential changes may have on our lives and communities. This module will use readings, activities, and discussion to explore the mechanisms that influence climate over time, in the past, present, and future.

Assessment: Course work (100%)

GGU33021 Research Skills and Data Analysis in Geomorphology 2 (S2) 5 Credits
Elective: Earth System Science
Module coordinator: Dr Margaret Jackson
Earth's surface is constantly changing. Understanding how and why these changes occur is a key skill for those across the Earth Sciences, from physical and human geographers to geo- and environmental scientists. This module focuses on the role of water in the evolution of Earth's landscape. Though investigating fluvial processes and sediment transport, students will gain first-hand experience in constructing simple models to help them estimate the rate and magnitude of surface processes. Students will also practice sediment classification, quantitative problem solving, and map making.

This module relies heavily on hands-on activity and skill practice in addition to traditional classroom lectures and discussion. This module also introduces key skills for students undertaking independent Capstone projects in their fourth year, and is a natural continuation of the module 'Research Skills and Data Analysis in Geomorphology 1' in semester 1.

Assessment: Course work (100%).

GGU33931 Environmental Governance 1 (S2) 5 Credits
Elective: Earth System Science
Module coordinator: Dr Rory Rowan
The "environment" emerged as a new object of concern in the 1960s. Since then, and largely through the work of citizens, scientists, environmental justice movements, and NGOs, many different environmental problems have been raised - from chemical contamination to climate change, from oil spills to plastic-filled oceans. Despite growing awareness of these many forms of environmental degradation, the political and societal response has been far from adequate. How can we explain this? One starting point is to interrogate the contested history and development of environmental politics since the 1960s. What we learn from such an approach is that there have been radically different ways of framing environmental problems, giving rise to radically different proposals on how to deal with these problems. This historically informed understanding thus invites us to consider how re-framing current environmental problems may help us to orientate society towards a more just and sustainable future.

This module will introduce students to the emergence of environmental politics as a unique field of policymaking, scientific production, and conflict since the 1960s. It will discuss key texts, writers and thinkers, whose work has been instrumental in shaping how we think about the environment, as well as how private, public and civil society actors have responded to environmental problems in recent times.

Assessment: Course work (100%).

GLU33005 Volcanism and Magmatism (S2) **5 Credits**
Core: Geology
Elective: Earth System Science
Module coordinator: Dr Emma Tomlinson
This module explores the origin, evolution and emplacement of magmas and the effect of magmatic and volcanic processes on society and the environment. The module provides an overview of the most important igneous rocks at a range of scales (tectonic setting, outcrop, hand specimen and thin section) through investigations of thin section and hand samples, videos and analogue experiments.

Prerequisites: We recommend that students planning to take this module also take "GLU33004, The Crystal World"
Assessment: Coursework (50%); end of semester examination (50%)

GLU33007 Earth Resources for a Critical Future (S2) **5 Credits**
Core: Earth System Science
Elective: Geology
Module coordinator: Dr Sean Mc Clenaghan
Decarbonization of society's energy infrastructure will involve a significant shift from fossil fuel extraction to the mining of "energy minerals" for the fabrication of green energy infrastructure. This module introduces students to a wide range of mineral deposits with an emphasis placed on raw materials critical to energy conservation, transport, and infrastructure. Students will gain a broad understanding of earth resources and important occurrences of mineral deposits in the Earth's Crust. The students will become familiar with the environments in which various ore resources and critical elements form as well as the implications for exploration, assessment and recovery of critical raw materials for a decarbonized society. Raw materials will be practically studied through thin section petrography, advanced micro-analysis, hand specimens and exploration drill core as well as field excursions to local mineral deposits in Ireland. Assessment of mineralization based on mineralogy and geochemistry, presence of known critical elements, precious metals and deleterious elements are addressed throughout the module.

Upon successful completion of this module students will be able to assess mineralization and identify favourable terranes for the concentration of critical raw materials. Students will also be able to analyse economic factors controlling the viability of raw materials and devise strategies for the exploration and recovery of a mineral resource.

Assessment: Course work (40%); end of semester examination (60%).

GLU33008 Metamorphic Rocks and Processes (S2) **5 Credits**
Core: Geology
Module coordinator: Dr Emma Tomlinson
Metamorphic rocks are the most common rocks on Earth and their compositions and textures provide information on the tectonic history or an area. This module introduces the minerals and mineral assemblages that develop in metamorphosed basic igneous rocks (metabasites), mudstones and shales (pelites) and limestones (calc-silicates) investigations of thin sections, hand samples and maps.

Assessment: Course work (50%); end of semester examination (50%).

GLU33009 Hydrology and Groundwater Quality (S2) **5 Credits**
Core: Earth System Science
Elective: Geology
Module coordinator: Dr Eyad Abushandi
This module aims to provide students with an understanding of hydrological processes, following the different pathways of water through the terrestrial part of the hydrological cycle. It also aims to familiarise students with the factors affecting groundwater quality, and to develop an understanding of groundwater quality issues in the context of integrated catchment management.

The hydrology component of this module includes the following topics: the hydrological cycle and catchment water balances; rainfall and evapotranspiration; soil water and hillslope hydrology; river flow; hydrogeology; groundwater – surface water interaction. The groundwater quality component includes groundwater chemistry and natural groundwater quality problems; groundwater quality issues in rural and industrial settings; groundwater vulnerability and protection. The interaction of groundwater and surface water quality is also considered.

Assessment: Course work (50%); end of semester examination (50%).

GLU33013 Tectonics & Structural Geology (S2) **5 Credits**
Core: Geology
Elective: Earth System Science
Module coordinator: Dr David Chew
Understanding the geometry and distribution of rocks in the subsurface is crucial for many applied aspects of the geosciences (e.g. groundwater flow, the distribution of natural resources, carbon sequestration and geothermal energy). This course aims to develop an understanding of structures produced by tectonics in the Earth's lithosphere at a range of scales from the tectonic plate to the microscopic scale. Lectures will explore (1) compressional, extensional and strike-slip tectonic regimes and the resulting geometry and types of structures that are produced (2) factors influencing the strength and mechanical behaviour of the Earth's crust and underlying mantle lithosphere and (3) the large-scale geodynamic processes controlling plate motions and crustal deformation.

Practicals will employ various tectonic regimes (mountain belts, rifts) as case studies to investigate aspects of structural geology and tectonics, by focusing on interpreting

geological maps, constructing geological cross-sections and using structural data to solve basic geological and tectonic problems.

Assessment: Course work (50%); end of semester examination (50%).

GSU33001 Research Methods for Geoscientists (S2) **5 Credits**
Core: Earth System Science
Module coordinator: Dr Michael Stock
The objective of this module is to develop the research skills required to plan and execute an individual piece of guided research (the capstone project). Students undertaking a Geosciences research project will receive some basic training in research design, critical evaluation of academic literature, and presentation skills.
Assessment: Coursework (100%)

GSU33007 Junior Sophister Geology Field Course (S2) **10 Credits**
Core: Geology
Elective: Earth System Science
Module coordinator: Dr David Chew
Undergraduate field courses provide vital experience in learning and practising geoscience subject skills. In this module students will embark on a two-week overseas field excursion designed to provide first-hand experience of working in unfamiliar geological contexts. Particular emphasis is placed on the collection of high-quality field observations and their subsequent interpretation.

Assessment: Coursework (100%)

IMPORTANT NOTE: This module will take place overseas and is slated to run in the **final week of Semester 2 and Trinity Week**. Students will be required to make a financial contribution to the cost of the trip (currently approximately **€1000**, but this may vary depending on inflation, flight prices, etc). Although there is a College student hardship fund which can be applied for (depending on individual financial circumstances), the costs for this field course usually are borne by the student.

TR062 Geoscience Senior Sophister Programme

The SS programme comprises **35 credits** of mandatory core modules that are taken by TR062 Geoscience students. Depending on your desired path of 1) Earth Systems Science or 2) Geology, mandatory module requirements will vary between the two pathways. All students are required to select an additional **25 credits** of modules, ensuring that a minimum of **10 credits** are chosen **in semester 1**.

Senior Sophister Course Coordinator: Dr Michael Stock

TR062 Science (Geoscience) Earth System Science Pathway Senior Sophister Year	
Semester One	**Semester Two**
MANDATORY CORE MODULES (35 Credits)	
GSU44001 Geoscience Research Capstone Project (20 Credits)	
GSU44003 Geoscience Frontiers: Past, Present and Future (5 Credits)	
GLU44009 Geoscience for a Sustainable Planet (5 Credits)	GSU44002 Senior Sophister Geoscience Field Course (5 Credits)
OPTIONAL OPEN MODULES (25 Credits)	
GLU44011 Palaeoceanography and Palaeoclimatology (5 Credits)	GGU44902 Karst Landscapes (5 credits)
GLU44012 Raw Materials in Building (5 Credits)	GGU44979 Living on the Edge: Estatuaries and Coasts (5 Credits)
GLU44008 Early Earth Evolution (5 Credits)	GLU44006 Carbonates: from the Atomic to Planetary Scale (5 Credits)
	GLU440XX Cyclostratigraphy and Astrochronology (5 Credits)

IMPORTANT NOTE: Senior sophister modules are subject to change.

TR062 Science (Geoscience) Geology Pathway Senior Sophister Year	
Semester One	**Semester Two**
MANDATORY CORE MODULES (35 Credits)	
GSU44001 Geological Survey Capstone Project (20 Credits)	
GSU44003 Geoscience Frontiers: Past, Present and Future (5 Credits)	
GLU44019 Lithoprobe: Advanced Earth Exploration (5 Credits)	GSU44002 Senior Sophister Geoscience Field Course (Spain 5 Credits)
OPTIONAL OPEN MODULES (25 Credits)	
GLU44011 Palaeoceanography and Palaeoclimatology (5 Credits)	GLU44004 Advanced Volcanology and Igneous Petrology (5 Credits)
GLU44012 Raw Materials in Building (5 Credits)	GLU44006 Carbonates: from the Atomic to Planetary Scale (5 Credits)
GLU44008 Early Earth Evolution (5 Credits	GLU440XX Cyclostratigraphy and Astrochronology (5 Credits)
	GGU44902 Karst Landscapes (5 credits)

Senior Sophister Geoscience Core Modules (Mandatory)

GLU44009 Geoscience for a Sustainable Planet (S1) **5 Credits**
Core: Earth System Science
Module coordinator: Dr Quentin G Crowley
Geoscience has a crucial role to play in implementing the Sustainable Development Goals (SDGs). In fulfilling a global strategy to achieve a more sustainable future for all, the role of Earth subsystems needs to be clearly mapped onto the SDGs. In the past, lack of a geoscience overview resulted in unsustainable development and several undesirable knock-on effects. For instance, the high energy output from combustion of fossil fuels was instrumental in development of key technologies as part of the industrial revolution and advancement of society. We now realise however, that large-scale utilization of fossil fuels led to the unintended consequence of increased greenhouse gas emissions and climate disruption on a planetary scale. Whereas climate-change is unequivocally one of the greatest challenges faced by society today, there are also new opportunities for geoscience to contribute to climate adaptation and mitigation strategies. For instance, with the phasing out of fossil fuels there is now a new demand for raw materials to support the transition to renewable energy.

Additionally, geoscience knowledge specifically developed for petroleum exploration now underpins carbon capture and storage technologies. In other areas, integration of geoscience knowledge is crucial for sustainable agriculture and food production. This module will explore various ways in which geoscience not only supports the SDGs, but also underpins global sustainable development across several sectors and systems.

Assessment: Course work (40%); end of semester examination (60%).

GLU44019 Lithoprobe: Advanced Earth Exploration (S1) 5 Credits
Core: Geology
Module coordinator: Dr Sean Mc Clenaghan
Much of our planet's surface has been subjected to a geological surveys and mineral exploration. Geologists must now focus on deeply buried terranes to further develop our understanding of crustal processes. Furthermore, decarbonization of society's energy infrastructure will require greater quantities of mineral resources and with much of the Earths near-surface resources depleted, a shift in exploration to deeper targets in the crust will require a full spectrum of techniques for geological interpretation and modelling. Students will gain a broad understanding of the processes responsible for the formation of mineral resources and their geochemical footprint in the Lithosphere. Geophysical, lithogeochemical and Geological data will be used to model geological formations and their potential for mineral resources.

Upon successful completion of this module students will be able to assess geological terranes using available data and assess their resource prospectivity.

Assessment: Course work (100%)

GSU44001 Geoscience Capstone Project 20 Credits
Core: Earth System Science/Geology
The Geoscience capstone project is a significant piece of individual research conducted under the guidance of a member of academic staff. The project takes one of two forms:

a) a **geological survey** which aims to solve the geological history and evolution of a specific area over time, presenting the results as a digitised geological map sheet (including cross-sections and stratigraphic column), with an accompanying, descriptive Memoir*; or
b) a **geosciences research project** which addresses specific research questions via field work, laboratory analysis, novel work on museum collection material / pre-existing data sets, or some combination of these, presenting the results in an extended written report (dissertation).

Assessment: Course work (100%)

***NOTE:** The geological survey Capstone project requires the student to conduct 5-6 weeks of field work during the summer between JS and SS. Whilst there is a College student hardship fund which can be applied for, the costs for this work in most cases will be borne by the student, so it is best to plan for these costs early if this is an option you would like to take. **Contact: Dr Christopher John Nicholas**

Students undertaking a Geological Survey capstone project will receive specialised training in geological mapping and instruction on how to translate field data into publication quality geological maps, cross-sections and reports immediately prior to undertaking their field work. **Contact: Dr Michael Stock**

GSU44003 Geoscience Frontiers: Past, Present and Future **5 Credits**
Core: Earth System Science/Geology
Module coordinator: Emma Tomlinson
This module explores the history, evolution and frontiers of geoscientific research. A new topic will be examined each week, starting with an introductory lecture, followed by time for reading and finishing with a symposium session with talks, posters and discussion on current thinking on the topic. The lecture will focus on the original ideas, how they were received and whether these ideas have been accepted, rejected or remain contested. The symposium sessions will focus on current ideas, problems and controversies in the geosciences.

Assessment: Continuous Assessment (100%)

GSU44002 Senior Sophister Geoscience Field Course (S2) **5 Credits**
Core: Earth System Science/Geology
Module coordinator: Quentin G Crowley
This module comprises a one-week residential field course that is usually held overseas. It provides students with practical experience in conducting primary research across a range of geoscience themes. Students are required to complete a series of guided research tasks and to present the results of their work in evening seminars, and in written form as a field notebook and report. This field course further develops practical fieldwork and problem-solving skills. Emphasis is placed on the application of geoscience techniques in real-world situations.

Assessment: Course work (100%)

IMPORTANT NOTE: This module will take place overseas and is slated to **run in the final week of Semester 2**. Students will be required to make a financial contribution to the cost of the trip (currently approximately **€1000**, but this may vary depending on inflation, flight prices, etc). Although there is a College student hardship fund which can be applied for (depending on individual financial circumstances), the costs for this field course usually are borne by the student.

Senior Sophister Geoscience Open Modules (Optional)

Students select **30 credits** of open modules during their Senior Sophister year (15 credits each Semester). Module selection may be limited by prerequisites or quotas.

Semester 1

GLU44011 Palaeoceanography and Palaeoclimatology (S1) **5 Credits**
Elective: Earth System Science/Geology
Module coordinator: Dr Gerald Dickens
In the past 250 million years Earth has experienced significant physical, chemical and biological changes of the atmosphere, oceans and terrestrial environments; leading up to the planet that we live on today. How did this little blue planet evolve over that time, and how have we figured out its amazing history? In this course we will study the gradual long-term evolution of Earth, on land and in the oceans, and how this was interrupted by extreme global change events such as global mass extinctions, oceanic anoxic events, hyperthermals, but also more locally the Messinian Salinity Crisis, Pleistocene climate transitions, or the Younger Dryas. We study the forensics on how to constrain Earth's past, and how this helps us to understand the present, and predict the future.

Assessment: Course work (65%); end of semester examination (35%).

GLU44012 Raw Materials in Building (S1) **5 Credits**
Elective: Earth System Science/Geology
Module coordinator: Dr Robbie Goodhue
The module will explore several recent failures in building materials and their legacy, highlighting the need for professional geoscientists in the industry. We explore the types of bulk raw materials and end uses (road dressing, concrete and mortar aggregate, fill, soil) in Ireland, focusing on specified properties and national standards. Basic testing methods and advanced analytical techniques will be covered, along with method and standard development. Predicting the stability of raw materials and the lifespan of the structures they are used in will introduce the topics of site-won material, recycling and alternative green building materials. The quarrying / extraction and processing will be taught with a trip to a working quarry / gravel pit / recycling and site stabilisation site.

Assessment: Course work (30%); end of semester examination (70%).

Semester 2

GGU44902 Karst Landscapes (S2) **5 Credits**
Elective: Earth Systems Science/Geology
Module coordinator: Dr Pete Akers
The dissolution of limestone and other carbonate bedrocks produces unusual landscapes dominated by underground drainage. Globally, these carbonate rocks underlie 12–20% of the Earth's land surface that support a quarter of the world population. When these bedrocks are exposed at the surface, dissolution carves a distinctive topography known as karst. Karst landscapes are known for their scenic mixture of peculiar landforms which include sinkholes, disappearing streams, turloughs, and caves. Karst and limestone aquifers are an important source of domestic and industrial water for billions, and the distinct hydrology of karst produces unique ecosystems and high biodiversity. However, the environmental properties that set karst apart from other landscapes also make it vulnerable to human mismanagement and pollution. Proper stewardship of limestone landscapes requires us to understand how they differ from other, better known landscapes, and this is particularly important for Ireland, which has over 40% of its land underlain by limestone. For students interested in protecting Irish water and biodiversity resources, including those at some of Ireland's most distinctive landscapes such as the Burren, this module provides the foundational understanding of karstic geomorphology, hydrogeology, and geochemistry for future success when operating in such environments.

Assessment: Course work (100%)

GGU44979 Living on the Edge: Estuaries and Coasts (S2) **5 Credits**
Elective: Earth Systems Science
Module coordinator: Dr Iris Moeller
Coastal regions are some of the most dynamic on Earth, not least because human and natural processes act in tight connection to each other. This dynamism poses one of the great societal challenges of the 21st Century: as coastal populations are increasing at three times the global rate, they are also experiencing an increasing threat of coastal flooding and erosion under climatic extremes (e.g. tropical and extratropical storm surges), and are 'locked into' accelerated sea level rise for centuries to come. Building upon a basic, foundational knowledge of ocean and coastal processes covered in relevant modules within the first and second year ('Spaceship Earth' and 'Physical Geography: Dynamic Earth'), students will gain wide ranging theoretical and practical skills required to address those challenges. The lectures and seminars take students on a journey that highlights how the natural processes operating within estuaries and on coasts are a function of external factors (past and present climate, geology, human influences) and feedbacks in which the landforms themselves affect the operation of processes that shape the landforms. Equipped with this knowledge, and several examples from around the world, students will put their knowledge into practice.

A day-field trip and practical exercise will challenge students to apply what they have learnt to real-world coastal management problems. Working in groups, they will form 'coastal management consortia' that will navigate their way through the stages of problem definition to data acquisition and development of appropriate coastal management

solutions. The assessed practical exercise will develop and enhance team-working, independent research, critical thinking, scientific and applied writing, and presentation skills.

Assessment: Course work (100%)

GLU44004 Advanced Volcanology and Igneous Petrology (S2) 5 Credits
Elective: Geology
Module coordinator: Dr Michael Stock
Details: This module will introduce students to the state-of-the-art and outstanding research challenges in volcanology and igneous petrology. Classes will progress sequentially from mantle petrogenesis, through crustal magma processing, to eruptive processes and volcanism at the Earth's surface. The module will draw on aspects of geochemistry, petrology and geophysics. Students will be introduced to petrological and geochemical tools/models, learning how these can be applied to understand the architecture and dynamics of magmatic systems from analyses of rocks and minerals at the Earth's surface.
Prerequisites: GLU33005 Volcanism and Magmatism

Assessment: Course work (40%); end of semester examination (60%)

GLU44006 Carbonates: from the Atomic to Planetary Scale (S2) 5 Credits
Elective: Earth System Science/Geology
Module coordinator: Dr Juan Diego Rodriguez-Blanco
Carbonate minerals constitute the Earth's largest reservoir of carbon and thus take a key role in the carbon cycle. Their occurrence is widespread, forming primary deposits in natural waters (e.g., oceans, lakes, hydrothermal systems and caves) through precipitation from supersaturated waters. They can form in many different environments, from carbonate-rich magmas, to biomineralisation, or as secondary minerals during the weathering of primary silicates during reactions with dissolved CO2 or organic compounds.
This module provides a review of the most important carbonate minerals, their stability, reactivity and natural distribution. After an introduction on the importance of carbonates in Earth and planetary sciences, technology, carbon capture and storage and environmental sciences, we will focus on the chemistry and structures of carbonate minerals and the discussion on the processes that lead to adsorption and uptake of foreign ions by these minerals. The module concludes with the principal methods for carbonate synthesis and key tools for characterisation.

Assessment: Course work (50%); end of semester examination (50%).

GLU44008 Early Earth Evolution (S1) **(5 Credits)**
Core: Earth System Science/Geology
Module coordinator: Dr David Chew
The module introduces the various types of metal ore deposits with an emphasis on base metals, including Irish zinc deposits. For each type of deposit, students will be exposed to the most common ore minerals in hand specimen, and for selected types, drill cores containing relevant rock types. Deposit types will be explained in the petrologic context that most commonly hosts the ores. Finally, the strategies for mineral exploration and the economics of mineral exploration and production will be explained with case studies.

Assessment: Course work (60%); end of semester examination (40%)

GLU440XX Cyclostratigraphy and Astrochronology (S2) **(5 Credits)**
Elective: Geology
Module coordinator: Dr Matthias Sinnesael
Module descriptor to be confirmed

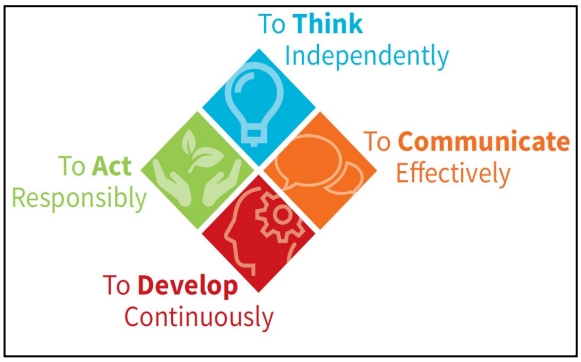
Assessment: To be confirmed.

Graduate Attributes

The Trinity Graduate Attributes represent the qualities, skills and behaviours that you will have the opportunity to develop as a Trinity student over your entire university experience, in other words, not only in the classroom, but also through engagement in co- and extra-curricular activities (such as summer work placements, internships, or volunteering).

The four Trinity Graduate Attributes are:

- To Think Independently
- To Act Responsibly
- To Develop Continuously
- To Communicate Effectively



Why are the Graduate Attributes important?

The Trinity Graduate Attributes will enhance your personal, professional and intellectual development. They will also help to prepare you for lifelong learning and for the challenges of living and working in an increasingly complex and changing world.

The Graduate Attributes will enhance your employability. Whilst your degree remains fundamental, also being able to demonstrate these Graduate Attributes will help you to differentiate yourself as they encapsulate the kinds of transversal skills and abilities, which employers are looking for.

How will I develop these Graduate Attributes?

Many of the Graduate Attributes are 'slow learned', in other words, you will develop them over the four or five years of your programme of study.

They are embedded in the curriculum and in assessments, for example, through undertaking independent research for your final year project, giving presentations and engaging in group work.

You will also develop them through the co-curricular and extra-curricular activities. If you help to run a club or society you will be improving your leadership skills, or if you play a sport you are building your communication and team-work skills.

Important information

Progression and Awards

Information on progression and awards can be found via the following webpage:
https://www.tcd.ie/teaching-learning/academic-affairs/ug-prog-award-regs/index.php

Attendance

All students should enter residence in or near Dublin and must begin attendance at the College not later than the first day of teaching term and may not go out of residence before the last day of teaching term unless **they have previously obtained permission from the Senior Lecturer through their tutor.**

Students must attend College during the teaching term. They must take part fully in the academic work of their class throughout the period of their course. Lecture timetables are published through my.tcd.ie, and on school or department notice-boards or in Blackboard before the beginning of Michaelmas teaching term. The onus lies on students to inform themselves of the dates, times and venues of their lectures and other forms of teaching by consulting these timetables.

The requirements for attendance at lectures and tutorials vary between the different faculties, schools, and departments. The school, department, or course office, whichever is relevant, publishes its requirements for attendance at lectures and tutorials on noticeboards, and/or in handbooks and elsewhere, as appropriate.

Assessment: Procedures for the non-submission of coursework and absence from examinations

All students must fulfil the course requirements of the school or department, as appropriate, with regard to attendance and course work. Where specific requirements are not stated, students may be deemed non-satisfactory if they miss more than a third of their course of study or fail to submit a third of the required course work in any term.

Full regulations on non-submission of coursework can be found via the following:
https://www.tcd.ie/calendar/undergraduate-studies/general-regulations-and-information.pdf

At the end of the teaching term, students who have not satisfied the school or department requirements may be reported as non-satisfactory for that term. Students reported as non-satisfactory for the Michaelmas and Hilary terms of a given year may be refused permission to take their semester two assessment/examinations and may be required by the Senior Lecturer to repeat their year.

Further details of procedures for reporting a student as non-satisfactory are given on the College website at https://www.tcd.ie/academicregistry/student-cases/

Student Services

Trinity Tutorial Service
The Tutorial Service is unique, confidential, and available to all undergraduate students offering student support in all aspects of College life. The Tutorial Service is supported and co-ordinated by the Senior Tutor's Office which is located on the ground floor in House 27.

Opening Hours and Appointments
The Senior Tutor's Office is open for student appointments between 10.30am - 12.30pm and 2.30pm - 4.00pm Monday to Friday ONLY (email stosec@tcd.ie to arrange an appointment).
What is a Tutor?
A Tutor is a member of the academic staff who is appointed to look after the general welfare and development of the students in his/her care. Whilst the Tutor may be one of your lecturers, this is not always the case as the role of the College Tutor is quite separate from the teaching role.

When should I go to see my Tutor?
You should visit your Tutor whenever you are worried or concerned about any aspect of College life or indeed your personal life, especially if it is affecting your academic work. The conversation with your Tutor takes place in strictest confidence. Unless you give him/her permission to do so, s/he will not divulge information given to them to anybody, whether a member of College or to anyone outside College (to your parents/family for example). Your Tutor can only help you if s/he knows you are facing difficulties, so if you are worried about anything go and see your Tutor before things get out of hand.

Further information on the Senior Tutors Office and College Tutors may be found via the following webpage: **Senior Tutor Services**
https://www.tcd.ie/seniortutor/students/undergraduate/

Disability Services
The Disability Service aims to provide appropriate advice, support and information to help students and staff with disabilities. The Disability Service has in place a range of supports to ensure that students with disabilities have full access to the same facilities for study and recreation as their peers. Most students registering with the Disability Service request access to a range of supports that help the student reach their full potential while studying. Most students' needs are accommodated through these supports. The student decides what level of support they require.

For contact information or to make an appointment please contact the Disability Services – contact details are available via the following webpage:
https://www.tcd.ie/disability/contact/

Learning Development
Student Learning Development offers support in a variety of study and learning skills including essay writing, exam preparation, study skills, self and time-management and note taking. Mechanisms of support are workshops, individual appointments and drop-in clinics.
https://www.tcd.ie/sld/

Student Counselling
The Student Counselling Service is here to help you to manage any difficulties you are experiencing so you can enjoy and fully participate in your time here at College.

If you wish to make an appointment with the Student Counselling Service, please consider one of the options below. If you have any other queries you can call into reception on the 3rd floor of 7-9 South Leinster Street or contact us on:
Phone: (01) 896 1407
Email: student-counselling@tcd.iehttps://www.tcd.ie/studentcounselling/
Webpage: https://www.tcd.ie/studentcounselling/

Useful College Websites:

Student Life
Student life offers information on Supports and Services, Clubs and Societies, Student Unions etc., https://www.tcd.ie/students/

Academic Registry
The Academic Registry is responsible for services that support the complete student lifecycle of Trinity College Dublin – from application to graduation.

For information on Registration, Fees, Grants, ID Cards etc. visit the Academic Registry (AR) in the Watts Building, on the first floor, or the visit the AR website:
https://www.tcd.ie/academicregistry/

Student Accommodation
https://www.tcd.ie/accommodation/

Dates to note

Event(s)	Date(s)
Closing date for submission of Mod Preferences	18th April 2025
Semester two assessments session	22nd April to 2nd May 2025
Publication of Science examination results	29th May 2025
Publication of First Round Sophister Places	Tuesday 8th July 2025
Reassessment Examinations	25th August to 29th August 2025 (TBC)
Publication of Second Round Sophister places	10th September 2025 (TBC)
Semester one starts	15th September 2025
Semester one ends	5th December 2025
Semester one examinations	15th December to 19th December

Teaching term dates 2025-26

Michaelmas Term Monday 15 September - Friday 05 Dec 2025			**Hilary Term Monday 19 January 2026 - Friday 10 April 2026**		
Teaching wk. 1	Week 04	15 Sept – 19 Sept	Teaching wk. 1	Week 22	19 Jan - 23 Jan
Teaching wk. 2	Week 05	22 Sept – 26 Sept	Teaching wk. 2	Week 23	15 Jan – 30 Jan
Teaching wk. 3	Week 06	29 Sept – 03 Oct	Teaching wk. 3	Week 24	02* Feb – 6 Feb
Teaching wk. 4	Week 07	06 Oct – 10 Oct	Teaching wk. 4	Week 25	09 Feb – 13 Feb
Teaching wk. 5	Week 08	13 Oct – 24 Oct	Teaching wk. 5	Week 26	16 Feb – 20 Feb
Teaching wk. 6	Week 09	20 Oct - 24 Oct	Teaching wk. 6	Week 27	12 Feb – 27 Feb
Study week	**Week 10**	**27 Oct – 31 Oct**	**Study week**	**Week 28**	**02 Mar – 06 Mar**
Teaching wk. 8	Week 11	03 Nov – 07 Nov	Teaching wk. 8	Week 29	09 Mar – 13 Mar
Teaching wk. 9	Week 12	10 Nov – 14 Nov	Teaching wk. 9	Week 30	16* Mar – 20 Mar
Teaching wk. 10	Week 13	17 Nov – 28 Nov	Teaching wk. 10	Week 31	23 Mar – 27 Mar
Teaching wk. 11	Week 14	24 Nov – 28 Nov	Teaching wk. 11	Week 32	30 Mar - 03 Apr *
Teaching wk. 12	Week 15	01 Dec – 05 Dec	Teaching wk. 12	Week 33	06* Apr – 10 Apr

October bank holiday – Monday 27th October 2025
February bank holiday – Monday 2nd February 2026
St Patrick's Day - Tuesday 17th March 2026
Good Friday – 3rd April 2026
Easter Monday – 6th April 2026

Dates are correct at time of publication, however; they are subject to change in line with College policies and procedures. All changes will be reflected on the Science Course Office webpages: www.tcd.ie/Science and on the College Calendar website: https://www.tcd.ie/calendar/academic-year-structure/academic-year-structure.pdf

TR062: Geography and Geoscience contact information

Course Director TR062: Geography and Geosciences

Dr Sean McClenaghan

E-mail: mcclens@tcd.ie

Ph: 01 896 1585

School Manager, School of Natural Sciences

Mr James Higgins

schnatsc@tcd.ie

Ph: 01 896 4218

Geography Department

Ms Helen O'Halloran

E-mail: geography@tcd.ie

Ph: 01 896 1576

Geology Department

Ms Debora Dias

E-mail: TR062Admin@tcd.ie

Ph: 896 1074

Appendix 1

Item	Reference/Source
General College Regulations	Calendar, Part II, General Regulations and Information,Section II, Item 12
Emergency Procedures	In the event of anemergency, **dial Security Serviceson extension 1999** Security Services provide a 24-hourservice to the college community, 365 days a year. They are the liaison to the Fire, Garda and Ambulance services and all staff and students are advised to alwaystelephone extension 1999 (+353 1 896 1999) in case of an emergency. Should you require any emergencyor rescue services on campus, you must contact Security Services. This includes chemical spills,personal injury or first aid assistance. It is recommended that all studentssave at least one emergency contact in their phone under ICE (In Case of Emergency).
Health and Safety	Faculty of Science, Technology, Engineering and Mathematics website - https://www.tcd.ie/stem/undergraduate/health-safety.php School Handbooks will have School/Discipline information on Health and Safety.
Data Protection	https://www.tcd.ie/dataprotection/ https://www.tcd.ie/dataprotection/assets/docs/dataprotectionhandbook/DP_Handbook_15042021.pdf
Academic Integrity	https://www.tcd.ie/teaching-learning/academic-integrity/
Research Ethics	https://www.tcd.ie/research/support/ethics-integrity.php
Blackboard	Blackboard
Explanation of Weightings	https://www.tcd.ie/teaching-learning/ug-egulations/Academic_credit_system.php
Assessment and Progression Regulations	https://www.tcd.ie/media/tcd/about/policies/pdfs/academic/assess-acad-prog-nov2021.pdf https://www.tcd.ie/teaching-learning/academic-affairs/ug-prog-award-regs/ Calendar, Part II, General Regulations and Information,Section II, Item 35
Academic Awards	https://www.tcd.ie/teaching-learning/academic-policies/assets/academic-awards-jan2021.pdf

Item	Reference/Source
Equality, Diversity and Inclusion	https://www.tcd.ie/equality/
Prizes, medals, and other scholarships	https://www.tcd.ie/calendar/undergraduate-studies/prizes-and-other-awards.pdf
Teaching and Learning Study Abroad	https://www.tcd.ie/study/study-abroad/
Marking Scales	Calendar, Part II, General Regulations & Information,Section II, Item 30 Please consult Schools or Disciplines directly or programme handbooks for further information.
Framework of qualifications Trinity Pathways	https://www.qqi.ie/national-framework-of-qualifications Trinity PathwaysTrinity Courses
Capstone (UG Programmes)	https://www.tcd.ie/teaching-learning/ug-regulations/Capstone.php
Careers Information	https://www.tcd.ie/Science/careers/ For further information refer to School/Discipline Handbooks.
Careers Advisory Service	https://www.tcd.ie/Careers/
Attendance Requirements	Calendar, Part II, General Regulations and Information,Section II, Items 17-23 Calendar, Part III, General Regulations and Information,Section I 'Attendance and Off-Books'; Section II 'Attendance'; Section III 'Attendance, Registration, Extensions'; Section IV
Student Cases	https://www.tcd.ie/academicregistry/student-cases/
Student complaints procedures	https://www.tcd.ie/media/tcd/about/policies/pdfs/Student-Complaints-Procedure-21.07.22.pdf
General Examination Guidelines	Exam Guidelines - Academic Registry - Trinity College Dublin
Feedback and Evaluation	Student Evaluation andFeedback Procedure for the conduct ofFocus Groups
Academic Policies and Procedures	https://www.tcd.ie/teaching-learning/academic-policies/
Registration	https://www.tcd.ie/academicregistry/student-registration/
Student supports	https://www.tcd.ie/students/
STEM Schools and Disciplines	https://www.tcd.ie/structure/faculties-and-schools/#d.en.2024679
GradIreland Career advice, graduate jobs and internships	https://gradireland.com/
Alumni Student Mentoring programme	https://www.tcd.ie/alumni/mentoring/students.php https://www.tcd.ie/alumni/mentoring/events-guide.php