Maynooth University
National University of Ireland Maynooth

Department of Geography

MSc. in Geographic Information Systems and Remote Sensing

COURSE HANDBOOK

2025-2026

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Contents of Handbook

1. WELCOME TO THE DEPARTMENT FROM THE HEAD OF GEOGRAPHY

11 September, 2025

Dear Students,

Welcome to Maynooth University's Department of Geography and to the Masters in GIS and Remote Sensing. This is a world-class MSc led by my colleagues, Dr Conor Cahalane and Dr Kevin Credit, brilliant researchers and teachers with wide-ranging experience across the fields of spatial analysis, remote sensing, and spatial machine learning. Importantly, they also have an incredible grasp of what you need to do in the year ahead. I urge you to draw on their knowledge and to make the very most of your time here in Maynooth.

I also want to ask that you contribute to the Department of Geography while you are here. Come along to our seminars, if you can. Take up opportunities to tutor our Undergraduate students. Write for our blog, *Eye on the World*, or for the staff-student journal, *Milieu*. Get to know staff and other postgraduate students.

Most of all, enjoy the year ahead and when you leave and do amazing things, remember us and keep in touch!

Dr. Alistair Fraser

Head of Department, Geography, Maynooth University.

2. IMPORTANT DATES

First Semester

Friday, 19th September 2025 – 11am, Central Postgraduate Taught Student Welcome and Orientation Event.
Monday 22nd September 2025: MSc Welcome and Lectures commence in Rhetoric House at 10am.
Monday October 6th – Remote Sensing Lunchtime Seminar.
Monday 27th October to Sunday 2nd November 2025: Study Week *(No Classes)*
Monday 15th December 2025: Final Week of First Semester Lectures
Monday 22nd December to Friday 2nd January 2026: Christmas Vacation *(No Classes)*
Monday 5th 2026: Study Week *(No classes)*
January 12th to 25th 2025: Examinations *(No Classes **except** for those taking GY643 Marine RS as an Optional)*
January 26th to 31st 2025: Inter-Semester Break *(No Classes)*

Second Semester
Monday 2nd February 2026 – Bank Holiday *(No Classes)*
Tuesday 3rd February 2026: Start Semester 2; Lectures resume
Monday 16th March to Friday 20th March 2026: Study Week *(No Classes)*
Monday 6th April to Friday 10th April 2026: Easter Vacation *(No Classes)*
Monday 4th May 2026 – Bank Holiday *(No Classes)*
Tuesday 5th-Friday 9th May 2026 Last week of Lectures for Second Semester
Monday 18th May 2025: Recommended start date for work placement.
Wednesday 31st July 2026: Deadline for submission of work placement reports and end of course.

3. INTRODUCTION AND USE OF HANDBOOK

The MSc in GIS & Remote Sensing at Maynooth University is offered by the Department of Geography to provide Graduates with the knowledge, skills and experience necessary to enable them to *work in the GIS and Remote Sensing industries or to apply the skills learned to a range of other working environments.* It also develops core transferable skills, which match an increased public use and knowledge of geo-spatial data. The course was first offered as a Higher Diploma in 1996, (with a top-up, MSc option in 2000), supported by the NDP's Advanced Technical Skills Programme, in response to the need for trained GIS and RS graduates and is the longest-running course of its type offered in Ireland. The programme transferred across to a full taught MSc in 2009-10. We received accreditation from the Society of Chartered Surveyors Ireland (SCSI) and the Royal Institution of Chartered Surveyors (RICS) in 2018.

The MSc in GIS & Remote Sensing is a full-time postgraduate programme running from the commencement of the first semester to the completion of the work placement at the end of July 2025. The modules offered are designed to impart a breadth of practical skills which will be of use in succeeding years, and to nurture independent and critical thinking on both applied and theoretical aspects of GIS and Remote Sensing. This handbook is intended to be the first point of reference for module and assessment overviews or for any queries that you have about the course. If you cannot find answers to any question you may have, please get in contact with the course director (Dr Conor Cahalane). Students are expected to actively participate in all lectures, tutorials/practicals and seminars and to fulfill the requirements of the various components of the course. Since this is a postgraduate course, a high level of performance and contribution is expected from each participant.

4. OBJECTIVES OF THE MSC

- To provide highly qualified, motivated graduates who have been trained in Geographical Information Systems, Remote Sensing, and Digital Image Processing and who can apply the information technology skills they obtain.
- To produce marketable graduates who will make significant contributions to Geographical Information Systems, Remote Sensing, and other disciplines within industry, government, and academia.
- To provide an understanding of Geographical Information Systems and Remote Sensing, the technology involved and its applications for specific investigations.

5. PROGRAMME OUTCOMES

At the end of this course students should be able to:

(RS Component)

- Demonstrate an understanding of the main physical principles behind remote sensing.
- Assess the operation of the main airborne and space-borne remote sensing systems.
- Critique applications of RS spatial data within information technology spheres.
- Develop a skillset in satellite image analysis and interpretation.
- Evaluate the concepts of digital image processing and acquire digital image processing skills.
- Demonstrate modelling skills for a range of state-of-the-art RS programs.

(GIS Component)

- Understand the fundamental principles of Geographical Information Systems (GIS)
- Fully understand the theoretical structures which underpin GIS and the wider GI Science.
- Obtain experience in using core GIS software.
- Develop confidence in the use of GIS to analyse and present information.
- Demonstrate a knowledge of the basic structures of digital datasets.
- Be competent in general analysis and modelling using a GIS.
- Have a solid grounding in core professional skills relevant to the GIS industry

6. TEACHING TEAM 2024-25

Dr Conor Cahalane	Course Leader/RS	R 7 Rhetoric	Conor.Cahalane@mu.ie
S1 Drop-In Hours: 12:30pm -1:30pm on Monday and Tuesday			
Dr Kevin Credit	Lecturer/GIS	2.21 Iontas	kevin.credit@mu.ie
S1 Drop-In Hours: 1-2pm Monday & Tuesday			
Prof. Chris Brunsdon	Head of NCG	R2.20 Iontas	Christopher.Brunsdon@mu.ie
Other Teaching Staff			
Dr Olena Derzhuk	Dept. Of Computing	Eolas	Olena.Derzhuk@mu.ie
Xavier Monteys	INFOMAR	GSI	Xavier.Monteys@gsi.ie
Dr Janine Guinan	INFOMAR	GSI	Janine.Guinan@gsi.ie
Dr Eoin MacCraith	INFOMAR	GSI	Eoin.MacCraith@gsi.ie
Dr Fabio Sachetti	INFOMAR	MI	fabio.sacchetti@marine.ie
Oisin McManus	INFOMAR	MI	oisin.mcmanus@marine.ie
Kevin Sheehan	INFOMAR	MI	kevin.sheehan@marine.ie
Dr John Boyd	Smart Sea School	GMIT	John.Boyd@gmit.ie
Support Staff			
Michael Bolger	IT Technician	PG Lab	Michael.Bolger@mu.ie
Dr Michelle Curran	IT Technician	Laraghbryan 1.10/ Room 14 Rhetoric House	
Neasa Hogan	Dept Admin.	Room 23c	geography.department@mu.ie
Catherine O'Driscoll	"".	Room 23c	geography.department@mu.ie
Additional Key Contacts			
Head of Department:	Dr. Alistair Frasier		alistair.frasier@mu.ie
External Examiner:	Dr. Gavin McArdle		gavin.mcardle@ucd.ie

To contact the Administration staff please email geography.department@mu.ie. Where appropriate, a call or meeting on Teams can be arranged and then followed up with an in-person meeting if necessary.

7. PROGRAMME STRUCTURE AND REQUIREMENTS

To meet the requirements of the MSc, students are required to accumulate 90 credits. The module names and credit weightings are listed below by semester. Effectively, 6 modules are compulsory, accounting for 80 credits, with a choice of four modules (in italics) from which to select the remaining 10 credits. The programme will be delivered through a variety of different teaching modes which generally include; lectures, practicals (laboratory and field), workshops, visits and a work placement. A variety of assessment techniques will be used, including; practical assignments, examinations (practical, written and open book), presentations, reports and short essays. In addition, this course, due to its specifically applied orientation, does not have a formal written thesis. Instead, three substantial projects, each worth 10 credits, are embedded within taught modules to act as a *Thesis Portfolio*. We find that this gives students the chance to develop a breadth of knowledge and is often more appealing to potential employers than a hard-bound thesis. The thesis portfolio will consist of one RS and two GI projects. More details on the individual modules and the thesis portfolio component are listed in Section 19. To qualify for the award of Master of Science, students must obtain a minimum of 40% for their research thesis and an average of 40% for all remaining components. Full details on University *Marks and Standards* are available at this link:

https://www.maynoothuniversity.ie/university-policies/academic-policies-procedures

Total Credit Requirement 90 Credits (Incorporates 30 Thesis Portfolio Credits+)
80 Compulsory Plus 10 Credits from one Optional (**Choose from four*)

Semester 1			
GY641	Aerial Surveys and Drone Operations	Conor Cahalane	10 Credits
GY636	Intro to GI Systems & Science	Kevin Credit	20 Credits+
** CS620C*	*Structured Programming*	*Mark McCormack*	*10 Credits*
** CS621C*	*Spatial Databases*	*Olena Derzhuk*	*10 Credits*
** GY672*	*Analysing Spatial and Temporal Data using R*	*Chris Brunsdon*	*10 Credits*
Semester 2			
GY642	Satellite RS and Earth Observation	Conor Cahalane	20 Credits+
GY638	GI in Practice	Kevin Credit	20 Credits+
** GY643*	*Marine Remote Sensing – INFOMAR*	*Guinan/Monteys*	*10 Credits*
Summer			
GY635	Work Placement	External	10 Credits

8. COURSE TIMETABLE AND STUDENT COMMUNICATION

The course timetable for semesters one and two are outlined below, all of the core classes will be hosted in Rhetoric House in the Rocque Lab (RL) or the Physical Geography Lab (PGL) where required. Other rooms on the timetable include the Seminar Room in Iontas as well as some field classes and visits across the two University Campuses.

We have deliberately timetabled for **Monday and Tuesday** to be intensive core teaching days to focus attendance and leave space for wider assessment, but also to provide flexibility to students. Your timetable has been organised to allow sufficient time for preparation for class and the timely completion of assignments. Postgraduate students will generally have priority access to the dedicated computer rooms in the Department, though they will be timetabled more heavily than usual this year, for general departmental teaching. Students should use their time in the computer lab as effectively as possible. In addition, you will carry out online and home-based laboratory work this academic year.

RS Modules (GY641/GY642)
Semester 1 GY641: Monday 10.00-12.00 and Tuesday 10.00-12.00
Semester 2 GY642: Monday 10.00-12.00 and Tuesday 10.00-12.00
Location: Physical Geography Lab (PGL) and Rocque Lab

GI Modules (GY636/GY638)
Semester 1 GY636: Monday 14.00-16.00 and Tuesday 14.00-16.00
Semester 2 GY638: Monday 14.00-16.00 and Tuesday 14.00-16.00
Location: Physical Geography Lab (PGL) and Rocque Lab

Optional CS/NCG/GSI Modules

CS620C	Three-week intensive course prior to formal start *(Sep 2nd to Sep 20th)*
CS621C	Friday 11:00-13:00 and 15:00-17:00 *(starts 3rd October)*
GY672	Wednesday 11:00 to 13:00, Semester 1, Iontas Building, Room 2.31 *(starts 24th Sept)*
GY643	Intensive 1-week lab course in *January 2026* & Cork Boat Trip (*tbc – February 2026*)

MOODLE

As much as possible, all course material is disseminated via the University's virtual-learning environment, Moodle. Each individual module, as well as the course overall, will have individual Moodle pages where new material, notifications, assessment and other directly relevant material will be posted. The overall course page will include any notifications related to the course overall and from the department more widely. Examples would include information on departmental timetables, events and initiatives, visits and occasional lectures, postgraduate student-related links and other university/departmental standards, for example, a citing/referencing manual used across the department. In addition, the bulk of assignment submissions will be made via Moodle using the *TurnitIn* evaluation software to help you identify any uncited material and improve your submission. You will also receive most of your assignment feedback from your lecturers here as well.

9. COVID-19 STATEMENTS

University Procedures: All delivery has returned to normal as was the case prior to March 2020.

Departmental Statement: All taught masters classes will be delivered live and in-person in 2025/26.

MSc GIS/RS Course Statement: Though we hope this will not be the case, if any new Covid-19 restrictions or associated university closures occur, the course content can be delivered online and is designed accordingly; using the same timetable. We will provide access to teaching support via MS teams during those times if it becomes necessary, though we hope it does not. Regardless of COVID-19, all students will be given access to key module-specific software at home and will also be set up with additional online accounts where necessary. This will allow full autonomy for practical revision, assignments and projects which can be done in college and/or at home, where necessary.

10. COURSE RESOURCES

The course is supported by a range of relevant equipment and resources. These include two dedicated computer laboratories, one with 22 PCs and double monitors and a second lab, with 16 PCs (as of September 2025) and double monitors. The labs are accessible by swipe card/code. Other hardware includes a large A0 plotter and A4 laser printers, while all AV equipment was substantially upgraded in Summer 2023 and wifi was upgraded in August 2025. Remote Sensing specialist equipment includes: *eBee ETK* Fixed Wing (Digital SLR camera); *Mavic 3E* multispectral drone, *Parrott Bluegrass* Rotary (Multispectral camera); dGNSS Rovers (with VRS modem); In addition, for students taking the GY643 module this will include a 2-day placement on the *RV Tom Crean* where they will have access to a Multibeam Echo Sounder; Sediment Grabber and Lab and a Remote Operating Vehicle gathering underwater videography.

A range of proprietary software available for home installation includes ArcGIS Pro, ArcGIS Online and Erdas Imagine. In addition, a number of modules use free and open-source software and data. We are also part of the National Mapping Agreement with Tailte Eireann which entitles students to access online a good range of raster and vector data layers, while we also subscribe to GeoDirectory, the national address database.

Wider University supports are also available in terms of teaching rooms, other publicly accessible computer laboratories, Learning Resources (Including a dedicated postgraduate research room in the University Library), IT Services. More student-focused University supports including the Access Office, the Writing Centre, the International Office and Graduate Studies etc. Additional supports and contacts for information as well as detail on procedures and processes are also listed in Section 18 below and we would recommend you also check the MU Postgraduate website regularly, https://www.maynoothuniversity.ie/study-maynooth/postgraduate-studies.

11. SEMINAR SERIES

In Semester 1 you are invited to attend the Department of Geography's seminar series which will include some topics which may be of interest including a **mandatory GI/Remote Sensing lunchtime talk from Dr Bernard Essel (Dublin City University – 12.30pm on Monday the 6th October, 2025**). The seminar series typically take place on Thursday afternoons at 4.00 pm in the Rocque Lab and draft details are listed at the end of this handbook and will be posted in

the labs and online. The series will introduce students to frontier research/research design across all strands of geography and will be delivered by a national or international researcher, who will present the methodology they have applied in a specific project. In addition, and of equal relevance, both NIRSA and the NCG run seminars in the Iontas Building on the North Campus, generally on Wednesday's and Thursday's. Please check their respective websites for notifications and we will pass on any information we receive as well, including whether these will be online or in-person events.

12. NIRSA (National Institute of Regional and Spatial Analysis), NCG (National Centre for GeoComputation) and SCSI/RICS (Society of Chartered Surveyors Ireland/Royal Institute of Chartered Surveyors).

Maynooth University has long been a leader in GI research in Ireland and this is reflected in the presence on campus of two Research Institutes with firm geo-spatial foundations, both under the broad aegis of the Maynooth University Social Sciences Institute (MUSSI). NIRSA has a specific focus on more applied uses of geo-spatial data and contains a number of staff, postgraduate and post-doctoral students who work with and on GIS. In particular a sub-group within NIRSA called AIRO (The All-Ireland Research Observatory) led by Justin Gleeson, has a very visibly public presence as a provider of online GIS information. We have established links with NIRSA as part of the course, include occasional workshops, visits and potential placements within their new Campus company, *People & Place* (https://peopleandplace.ie/about-people-and-place/).

The same applies to the NCG, where if anything the GIS and RS components are even more established. The NCG was funded by SFI in 2004 and set up to be the national site for research on geo-spatial knowledge and information. It too has staff, postdocs and postgraduates, a number of whom are involved in teaching, especially Dr Kevin Credit, who you will meet through the core GI modules, and also the Director, Professor Chris Brunsdon. Many others carry out RS research of interest like Professor Tim McCarthy who is the Irish National Copernicus delegate and one of the leading drone specialists in the country and we may have guest speakers from his team during the year. We also have links with the NCG in terms of visits, seminars and possible placements, especially given their innovative work in the technical areas of mobile and locational GIS and in theoretical geo-computation.

The consistent high quality of, and demand for, graduates from this MSc has resulted in the MSc in GIS & Remote Sensing being officially accredited by the *Society of Chartered Surveyors Ireland* (SCSI) and *Royal Institute of Chartered Surveyors* (RICS). Accreditation means that as a graduate from the MSc in GIS & Remote Sensing you will be eligible to proceed along the Geomatics pathway to professional membership of the SCSI and RICS. Being a Chartered Surveyor is a mark of excellence - one that combines academic achievement with internationally recognised professional standards. Achievement of chartered status will accelerate career progression in your profession, helps distinguish your business if self-employed and also facilitates working overseas as this is a globally recognised professional qualification.

13. ASSESSMENT WEIGHTINGS AND TIMINGS

SEMESTER 1		
GY641 AERIAL SURVEYS/DRONES	10 CREDITS	80% CA, 20% DIGITAL EXAM
GY636 INTRO TO GIS	20 CREDITS	25% CA, 25% OPEN BOOK EXAM +THESIS PORTFOLIO 1 (50%)
SEMESTER 2		
GY642 SATELLITE RS/EARTH OBS.	20 CREDITS	40% CA, 10% DIGITAL EXAM + THESIS PORTFOLIO 2 (50%)
GY638 GIS IN PRACTICE	20 CREDITS	35% CA, 15% OPEN BOOK EXAM + THESIS PORTFOLIO 3 (50%)
SUMMER		
GY635 WORK PLACEMENT	10 CREDITS	100% CA (REPORT/PRESENTATION)

Approximate deadlines (to assist students in their workload planning) are included for guidance below, but *please note these may change depending on course requirements*.

Semester 1 (2025)

10 October	GY641: Practical 1 (0%, formative only)
19 October:	GY636: Assignment 1 (0%, formative only)
7 November:	GY641: Practical 2 (40%)
23 November:	GY636: Assignment 2 (25%)
05 December	GY641: Practical 3 (40%)

08 December: GY641: Digital Exam (20%)
15/16 December: GY636: Open-Book Exam (25%)
18 Jan 2026: GY636: Research Project (50%)

Semester 2 (2026)
13 February*: GY642: Project Proposal & Presentation (2.5% *WIP Presentations March 10th)
8 March: GY638: Research Project Proposal (5%)
06 March GY642 Practical 1 (20%)
21 March: GY638: Group Website Presentations (35%)
8 April GY642: Practical 2 (20%)
14 April: GY638: Open-Book Essay (15%)
28 April: GY642: Digital Exam (10%)
05 May: GY638: Research Project (45%)
15 May: GY642: Project (47.5%)
31 July: GY635: Work Placement Reports (100%)

Information on all formal module descriptors can also be access via the University's Courses Page which you can access via the following url - http://apps.maynoothuniversity.ie/courses/?TARGET=CS&MODE=SEARCH.

Optional Modules - Please note assessment dates listed below for the Optional Modules are only provisional, and students should confirm with the lecturer in the Department of Computing for information on assessment deadlines/weightings on the CS620C and CS621C modules. Similarly, please refer to the lecturer in the NCG for information on assessment deadlines/weightings on the GY672 module and the INFOMAR course team for assessment weightings on the GY643 module. Depending on your choice of optional, you can expect assessment deadlines to fall around the following dates, and this should help you plan best how to balance with the core modules listed above:

Optional Modules Semester 1 (2025)

GY672 – Spatial/Temporal Processing in R
- Assignment 1 - (25%) - due on December 6th
- Assignment 2 - (25%) – due Friday 17th Jan
- Assignment 3 - (50%) open book exam - due 24th Jan

CS621C – Spatial Databases
- 14th November - Lab Exam 1
- 21st November - Lab Exam 2a
- 5th December - Lab Exam 2b
- 19th December - Lab Exam 3
- Project Info TBC

Optional Modules Semester 2 (2026)

GY643 – Marine RS *(dates are dependent on when we are assigned a slot for the boat/cruise)*
- Assignment 1 - (50%) - due mid-February
- Assignment 2 - (50%) - due mid-March.

14. ATTENDANCE/ DEADLINES/ MISSED ASSESSMENTS AND REPEAT OPTIONS

Attendance, punctuality and participation are compulsory for all classes and students are expected to come prepared to class. If there is a documented personal/medical reason for not coming to class, it is the student's responsibility to let the instructor and course director know in advance. As a postgraduate student learning to be a Master of your discipline, it is expected that you turn up for class on time and participate fully on all occasions. Problematic attendance, punctuality and participation will be reported to course director.

Mandatory deadlines will be strictly enforced. We have coordinated all assignments across modules so that student workload will not get piled up**. Assignments submitted after the set deadlines will be penalised 10% of their overall mark, per week,** with a cap/maximum penalty being that final grade can't drop below 40%. Exception: If there are, extremely extenuating personal or medical circumstances, the course director and instructor will consider extensions on a case-by-case basis. The circumstances must be communicated to, and accepted by, the lecturer prior to, or, in cases of unexpected emergencies, immediately after, the relevant deadline.

For all module assignments/coursework, the standardised cover sheet must be used and must include: (i) the name of the student, (ii) their student number, (iii) the title and code of the module, (iv) the name of the lecturer who gave the assignment in question; when appropriate, (v) a thematic title for the work; and (vii) the total word count of the student's work, along with (viii) what percentage the submitted work is over/under the assigned word count. A blank generic cover sheet will be available on the GYA600 webpage (MSc GIS-RS course Moodle page) and should be used for all assignments, you can see a sample of this below.

Word-count limits will be strictly enforced, and weighted penalties applied for continuous assessment work significantly over- or under-word counts at the lecturer's discretion. Students are required to specify what the assignment total word count is on the cover sheet accompanying submission of coursework.

Postgraduate programmes typically manage 'repeat' options in a different way than undergraduate ones. In our case we would hope that students will have submitted all work on time, but if there are good reasons to grant an extension (e.g. due to illness), we would still require all students to have completed all Semester 1 work before the start of Semester 2. There is good time in January to do this, even for agreed late submissions. If for whatever reason, there is still outstanding work from this point on, then we will deem it as 'repeat work' and there will be time, typically a date six weeks after the mid-May deadline, to submit any approved or even unapproved late work, which will be subject to penalties and capping as noted above and excluding the GY635 work placement which has a later submission date by necessity. Semester 2 work received after the 31st July **will not be graded** and the student must then explore formally repeating the module the following year with associated registration costs.

MSc GIS-RS 2025/26

GENERIC ASSESSMENT COVER SHEET

1. Module Code: **GY641 Aerial Surveying**	
2. Student name: C Cahalane	**3. Student number: 12345678**
4. Assignment Name: GNSS Prediction	
5. Date due: 2nd April **6. Date submitted: 1st April**	
7. Submission Word Count: 1100 *Word Count excludes bibliography, Tables of Contents and Figure/Table Captions*	
8. Percentage Over/Under Specified Word Count: 10% over *Student must quote the percentage over/under the requested word count.*	
9. TurnItIn Similarity Score: 0%	

Note: If your assignment has a bibliography, it must be in a dedicated section with 'Bibliography' as that section heading to ensure it is eliminated from the TurnItIn Similarity Score.

10. This section must be completed if a grade is to be awarded for this work:

I declare that this project is, excepting appropriately referenced and quoted material, entirely my own work and that any GenAI technology has only been used up to Level 2 according to the University Guidelines (i.e. for the initial stages of the assessment, including brainstorming, creating structures (outlines), and as a research assistant). I confirm that no GenAI output (including paraphrased) has been included in the final submission.

11. Signed: Signed Here 12. Date: 1/4/2026

15. GRADE RELATED CRITERIA

Marking criteria and guidelines used for marking are presented below and apply, as noted, to all essays, exams and reports. There are some additional elements specifically related to reports and these will apply particularly to the thesis portfolio projects and many of the module reports as well. For any other type of assessment that use slightly different criteria, e.g., presentations and other formats that differ from the above, then these should be read in conjunction with any specific advice on assessment that may be provided by module leaders, for those different assessment formats.

The grading system used for each module is as follows:

First Class Honours:	70+%
Second Class Honours Grade I:	60<69%
Second Class Honours Grade II:	50<59%
Pass:	40<49%
Fail:	<40%

ESSAYS, EXAMS, REPORTS

Class	Mark Range	Grade Related Criteria for Essays/Exams/Reports
First Class Honours	**80+** A+	– Outstanding answer based on extensive reading that demonstrates an impressive ability to understand theoretical literature and to make connections between that literature and appropriate examples. – Exceptional insight and originality in the use of evidence. – Very well written with no grammatical or other errors. – Contains material of publishable quality, as a whole or in part, as a journal paper, and is worthy of retaining for reference. ***(Reports)*** – Exceptional insight and originality in the application of methodology – Exceptional analytical skills as evidenced by – Ability to make connections between own results and the literature, where appropriate
	70-79 A (75-79) A- (70-74)	– Excellent answer based on extensive reading and a clear understanding of theoretical debates. – Original or insightful answer drawing on own observations and critical treatment of literature. – Contains material that is potentially of publishable quality, in part, as a journal paper, and / or is worthy of retaining for reference. ***(Reports)*** – Strong insight and/or originality in the application of methodology – Original or insightful answer drawing on own observations – Strong analytical skills – Ability to make connections between own results and the literature, where appropriate
Second Class Honours Grade I	**60-69** B+ (67-69) B (64-66) B- (60-63)	– Very good answer that shows a thorough understanding of arguments, contributions and context, with efficient use of relevant reading and examples. – Well organised, clearly expressed and a direct response to the question / topic. – Evidence of good analytical skills and reflecting wider reading. – Does not display the outstanding ability, critical acuity and/or originality characterising the award of first-class honours ***(Reports)*** – Shows insight and thoroughness in the application of methodology – Good analytical skills – Ability to make connections between own results and the literature, where appropriate

Second Class Honours Grade II	**50-59** C+ (57-59) C (54-56) C- (50-53)	– Competent treatment of ideas and concepts from classes and set reading – Little evidence of independent critical appraisal. – Evidence of good effort and sound argument, but little spark or critical insight. ***(Reports)*** – Competent but lacklustre application of methodology – Little attention given to limitations of approach – Good analytical skills – Lacks connections between own results and the literature, where appropriate
Pass	**40-49** D+ (47-49) D (44-46) D- (40-43)	– Shows a basic understanding of the question / topic and of the broader subject area – Little evidence of detailed knowledge or reading is partial and selective – Contains mistakes, misunderstandings or irrelevant material. – Poor organisation, poor expression and an uncritical approach. ***(Reports)*** – Poor organization and application of methodology – Poor analytical skill – Few connections between own results and the wider literature
Fail	**0-39** E (30-39) F+ (25-29) F (20-25) E (<20)	– At worst, nothing of relevance in answer to the question / topic. – At best, not a direct response to the question / topic, but shows some basic understanding of the general field. – Likely to be muddled and/or incomplete, and poorly expressed. – Little evidence of reading or reading sources are trivial. ***(Reports)*** – Inappropriate application of methodology – Poor understanding of approaches – No analysis of results – No connections between own results and the wider literature

16. RECEIVING FEEDBACK ON YOUR WORK

For the core modules feedback will be provided on Moodle for most of your coursework both in terms of a provisional numerical grade but also written comments and suggestions on how to improve in further work. The marking criteria above will help you to interpret the numerical grade assigned to your work. Feedback will not be provided before the final cut-off date for submission has passed. The timing of receipt of feedback after this time will vary between teaching staff and across departments, but every effort will be made to return work as promptly as possible, usually within 3 weeks for the core modules.

17. AVOIDING PLAGIARISM

All work submitted by a student must be expressed in the student's own words and must incorporate their own ideas and judgments. This applies equally to coursework and dissertations no less than to examinations. **Plagiarism—the presentation of another person's thoughts or words as one's own—in essays, dissertations or other assessed work violates all principles of sound academic practice and is a serious disciplinary offence. Where plagiarism is confirmed, candidates will be subject to University policy with the potential for award of zero on work submitted.**

Plagiarism: All work must be the student's own. To avoid plagiarism *direct* quotations from the published or unpublished work of others must be used sparingly, and always be clearly identified as such by being placed inside quotation marks, and a full reference to their source must be provided in the proper form. Equally, if you summarise another person's ideas or judgements, you must refer to that person in your text, and include the work referred to in your bibliography. Failure to observe these rules may result in an allegation of cheating. You should therefore consult your module leader or course director if you are in any doubt about what is permissible. A fuller plagiarism guide will be

made available to all students on Moodle and you will be required to use university resources such as **Turnitin**, a website to check submitted documents against its database and the content of other websites and student papers with the aim of identifying plagiarism. Results can identify similarities with existing sources and students can also use this in the early formative assessments to learn how to avoid plagiarism and improve their writing.

ChatGPT and Ai tools: Regarding the use of generative AI (GenAI) approaches such as ChatGPT to create written text: while these are powerful tools that are potentially useful as support systems for academic writing, for the purposes of this programme they CANNOT BE USED to generate any written products that you ultimately submit. The University's Working Generative AI Guidelines for Staff (April 2025)

https://www.maynoothuniversity.ie/sites/default/files/assets/document/MU%20GenAI%20Guidelines%20For%20Students%20%28March%202025%29.pdf

includes a useful table (in Section 5.2) to specify the levels of generative AI use that might be permissible on any given assessment across the University:

Level 2 ⇨

Types of GenAI use	Description
No GenAI permitted	The assessment is completed without GenAI assistance. GenAI is not used at any stage of the assessment. **Students using software with GenAI components should ensure that these are deactivated. If this is not possible, such software should not be used.**
GenAI assistance in research and structuring	GenAI can be used in the initial stages of the assessment, including brainstorming, creating structures (outlines), and as a research assistant. **No GenAI output (including paraphrased) in final submission.**
GenAI editing	GenAI can be used as an editing tool to improve the clarity or quality of assessment. It may *not* be used to create new content. **Students must provide a list of prompts.**
Full GenAI assistance	GenAI may be used throughout the assessment process, including the inclusion of GenAI output within the assessment. **All GenAI output should be referenced.** **A full list of prompts and GenAI outputs should also be included as an appendix.**

For the GIS and RS modules on this programme (that is GY636, 638, 641, 642, 643 and GY635 Work Placement), Level 2 use is permitted; in other words, generative AI can be used in the initial stages of the written assessments, including for brainstorming, creating outlines, and as a research assistant. However, **NO GENERATIVE AI OUTPUT – INCLUDING PARAPHRASING – IS ALLOWED IN ANY FINAL SUBMISSIONS**. Students must also follow the guidance from their Optional Module coordinator for the final module. Students will also be asked to sign a written declaration on the assignment cover sheet regarding their use of generative AI for every assignment. To track the inappropriate use of AI on assignments, the instructor will employ a holistic assessment of available information, including Turnitin Feedback Studio's "AI Indicator" (a score of >20% being noteworthy), past performance, the characteristics of the assignment (e.g., citation use, organisation, and style), and other relevant indicators. Where necessary and especially in cases of past infractions concerning use of GenAI, student interviews will be carried out for each submission with the course director or course team as appropriate.

18. UNIVERSITY AND DEPARTMENTAL POLICIES, RULES AND REGULATIONS

Maynooth University has a number of rules and regulations linked to its wider governance structures. Many of these are general for all students, but there are some of specific relevance to taught postgraduate courses.

ACADEMIC POLICIES AND PROCEDURES - the starting point for information across the board and ranges from University governance down to student services and supports: https://www.maynoothuniversity.ie/university-policies/academic-policies-procedures .There are also a number of categories with further information - clicking on each sub-heading brings up a list of downloadable documents. The main ones of postgraduate interest are the *Academic*; *Exams;* and *Marks and Standards* sections which will list a number of expectations linked to teaching and learning environments including expectations of both students and academic staff and provide information on credits, progression, grades etc., applicable to all undergraduate and postgraduate students, academic year 2025-26 and beyond.

ATHENA SWAN

The Athena Swan Charter is a national strategy to promote gender equality in higher education and was launched in Ireland by the Higher Education Authority in 2015. The Department of Geography has committed itself to the Athena Swan process of critical self-assessment and after a rigorous application, we were one of the first departments at Maynooth to earn 'bronze status' **and was awarded a renewal in 2024 of this certification**. We are committed to this process of advancing gender equity and opportunity, which means that during the year we will offer workshops that you can participate in. You may also be asked to let us know how we are doing through the end of semester and year questions about the modules and teaching we offer. The responses are anonymised by the University Athena SWAN officer and then passed back to the Department where they are considered by our Athena SWAN Committee. Recommendations are then passed to the Head of Department, and discussed in our Undergraduate, Postgraduate and Research Committees, and at Staff Meetings.

In this, we are supported by the University with its policies addressing: the under-representation of women in higher administrative and academic offices in the university; the need to make campus a place where diverse gender identity and expression are respected, including for our transgender and gender diverse staff and students; and a data collection and analysis system that alerts us to the many complex dimensions of equality, diversity, inclusion and interculturalism. We know that gender and sexuality intersect with other forms of discrimination in society, including around race, class, physical and mental challenges, citizenship-status, and nationality. You know it too, and with your help we will learn how to make Maynooth University a leader in recognising the needs and sustaining the flourishing of the diverse community of our state. If you have questions or would like to participate, please contact our Athena Swan committee chair, through the Departmental Office (as the post is currently being filled).

BULLYING AND SEXUAL HARRASSMENT

Bullying and sexual misconduct are unacceptable at Maynooth University. Bullying is where repeated mistreatment of a person undermines their capacity to thrive at university. In a university setting, this includes, but is not limited to, ridiculing a person or making abusive remarks. Sexual misconduct includes any sexual contact that is unwanted or to which someone did not or was not able to give consent. In full confidence of your complaint being received respectfully, seriously, and in confidence, you may contact the Head of Department or you may contact the Maynooth Student Union Vice President for Welfare and Equality, Niamh Riney, welfare@msu.ie, (01) 708 6808, (087) 630 6433; the Student Services Centre, 01 708 3554; or Maynooth University Access Office, access.office@mu.ie, (01)708 4600. There are also support services for victims of sexual violence including the 24-hour Rape Crisis Centre, counselling@rcc.ie, 1 800 77 8888; the Student Health Centre, (01) 708 3878; and the Student Counselling Service, (01) 708 3554.

We want Maynooth University to be a place where our students can fulfil their potential and to do that, we must treat other with respect. We must address the situations in which bullying, and harassment can occur. We have committed ourselves to following the strategies offered as part of the National Consent Framework of the Department of Education and Skills. To make Maynooth a place that is safe, respectful, supportive and positive, there are a number of initiatives now underway. First, the university will host workshops about what consent really means. These will be offered to staff and to students over the coming year. These are based on a programme developed at National University of Ireland Galway. Second the University will host a training programme to help us all learn how to intervene effectively when we see others suffering bullying or harassment. This programme is based on one developed by University College Cork. Staff and students can help our community by taking advantage of these workshops so that we all develop our awareness and make our commitment to a safe, respectful, supportive, and positive environment more effective. If you would like to be more pro-active still, you can volunteer for training to become a Facilitator for the either the Consent Workshops or the Bystander Intervention Workshops by emailing equality@mu.ie.

19. MODULE DESCRIPTIONS

SEMESTER ONE (*OPTIONS)

GY641 Aerial Surveys and Drone Operations (10 ECTS)
This module is taught within three broad areas. The first (i) introduces the key concepts of passive airborne surveys, including image capture methodologies, navigation and sensor technology and photogrammetric principles. A second area (ii) introduces the students to an active airborne survey technique, Light Detection and Ranging (LiDAR) and the potential complementary capabilities of this technology for different environments. The final component (iii) demonstrates the opportunities provided by drones as a new airborne survey platform, encompassing hardware, datasets, flight planning and operational restrictions. The module is a combination of theoretical and practical based sessions using both commercial and open-source software

GY636 Introduction to Geographical Information Systems & Science (20 ECTS)
This module introduces students to the fundamental concepts, techniques and ideas that shape GI Science and the associated GIS Software. The module will be taught as a mix of lectures and intensive practicals. The lecture series will introduce key concepts and analytical approaches used within GI Science including; the foundations of GIS, spatial data models, data input and output, core spatial modelling and specialist analytical approaches and techniques. The practicals will be based around the core ArcGIS Pro software programme. The module will familiarise students with the software through a series of cumulative practical exercises based on a series of GIS applications from a range of subjects including geography, environmental modelling and planning. Students will also gain experience of manipulating and understanding a range of digital spatial data in the course of this module.

CS620C Structured Programming (10 ECTS)
This intensive three-week module held prior to the beginning of Semester 1 introduces students to the basics of programming. Content includes; Programming fundamentals: variables, types, expressions and assignment; simple I/O; Conditional and iterative control structures (if statements and while loops); Strings and string processing; Use of class APIs for creating objects and calling methods; Understanding data abstraction and encapsulation; Problem solving: understanding and developing algorithms; Implementing algorithms as simple programs. Introduction to algorithms and data structures. Review of elementary programming concepts suitable for the implementation of abstract data types (operators, types and expressions; control of flow; methods; recursion; input & output); Algorithms for searching: linear, bounded linear and binary searches; Algorithms for sorting: selection, insertion, bubble and quick sorts; Fundamental linear data structures: stacks, queues, linked lists; Object-oriented programming: encapsulation and information hiding, classes, interfaces, class hierarchies, inheritance, polymorphism, basic exception handling; Analysis of basic algorithms.

CS621C Spatial Databases (10 ECTS)
The main focus of this module will be to introduce students to core aspects of spatial databases and their significance within GI Science. A range of skills will be learnt on this intensive 6-week module including; Designing and implementing spatial databases using standard models and spatial database management systems; Analysing and optimising spatial database designs to maximise efficiency and effectiveness; Querying spatial databases using standard query tools and languages; Creating interfaces to view, customise and interact with spatial data; Designing and implementing spatial indices for efficient searching of data and exploring reliability, security, integrity and privacy in spatial databases.

GY672 Analysing Spatial and Temporal Data using R (10 ECTS)
This module provides an introduction to the basics of data analysis, exploration and visualisation, with particular focus on spatial and temporal data. The module consists of a series of lectures including an introduction and start-up session to a takeaway practical exercise using the statistical programming language R. The module begins with basic methods to explore, describe and graphically represent one- and two-dimensional data, before moving on to consider more advanced methods to manipulate and visualise geographical information, and explore and identify trends and seasonal patterns in time series data. In addition, some methodological aspects of data analysis are introduced, in particular the use of open data and ‘citizen science’ data and the idea of reproducibility in data analysis.

SEMESTER 2

GY643 Marine Remote Sensing – INFOMAR (10ECTS)
This module is taught within three broad areas. The first (i) introduces the concept of ocean remote sensing, the marine framework and applications. A second area (ii) will encompass the Irish national seabed-mapping programme; INFOMAR (www.infomar.ie), detailing the current and future science and technologies employed in ocean mapping (iii), the third introduces students to different datasets and spatial data management tools for ocean remote sensing. The module is a combination of theoretical and practical based sessions using both commercial and open-source software.

GY642 Satellite RS and Earth Observation (20 ECTS)
This module is taught within three broad areas. The first (i) introduces the main concepts of satellite remote sensing including electromagnetic radiation and its interaction at different wavelengths with the atmosphere and surface for both passive and active sensors. A second area (ii) focuses on sensor technology and data acquisition systems of the primary space based remote sensing platforms including; the COPERNICUS missions; Landsat; geostationary satellites; commercial platforms. The final component (iii) focuses on digital image processing - i.e., how images acquired by different satellites are analysed and interpreted to provide information on the Earth. The module is a combination of theoretical and practical based sessions using both commercial and open-source software.

GY638 Geographical Information Science in Practice (20 ECTS)
This module examines aspects of geographical information science - the theoretical basis for geographical information systems. GIS may be thought of as a fusion of concepts emanating from cartography, computer science and geography. The module will have a particular focus on the core skills that students will need to enter the industry as professionals. The course will be run as a series of professional training workshops based around the core skills listed below. The workshops will be associated with a range of external agencies and internal experts to introduce students in turn to subjects including Internet GIS, Spatial Data Portals, Database Management Systems, Programming, Visualisation and Volunteered GI. The module will be run as a mix of professional training and practical applications.

GY635 Work Placement (10 ECTS)
This module provides students with practical experience in a work environment within which they can employ the GIS or RS skills that they have acquired during the course. Students are required to undertake a minimum of 250 hours work placement in a company(s) within which they will employ the knowledge and skills learned on the course. Typically work placements run from early May to the end of July with a six-week minimum period of employment. The department has forged strong links with information technology-based companies and many county councils and is often contacted by such companies seeking to employ such students. A selective list of companies, which have employed students in the past, include:

Irish Placements: *Apex Surveys; Arup Group; Aviva Insurance; Compass Informatics; Coillte Teoranta; County Councils (Various); Demographics Ireland; EraMaptec; ESRI Ireland; Fingleton White; Gamma; Geological Survey of Ireland; Government Departments (Various); Icon Group; IRIS Spatial Data Products; Irish Water/Uisce Eireann; Jacobs Engineering; Mallon Group; Mapflow; Marine Institute; Met Eireann; MKO Planning and Environmental Consultants; Murphy GeoSpatial; National Institute of Regional and Spatial Analysis; National Centre for GeoComputation; National Parks & Wildlife Service; Novogen; Office of Public Works; Ordnance Survey Ireland; Paradigm; People & Place; Plotbox; Proteus Solutions; Spatial Data Products; Spectral Signatures; Specterra Services; SWS Services; Teagasc, TLI Group.*

Overseas placements: *Luxembourg Institute of Social and Economic Research; NASA; New York State Water Board; Ramboll Group (Denmark); Saudi Arabian Government Departments; TDS Telecom, Fla; UN Humanitarian Office – Geneva.*

20. 2025-26 GEOGRAPHY SEMINAR SERIES and Postgrad Development Workshops

Seminars will be announced in the coming weeks. The provisional schedule is:

Oct 6, 1230-130pm: Dr. Bernard Essel, DCU – ****Remote Sensing Seminar – Attendance Required.**
Nov 6, 4pm-530: Prof. Gerry Kearns, MU
Mar 5, time tbc (probably 4-530): Dr. Margaret Jackson, TCD
Apr 2, time tbc (probably 4-530): PhD Student Presentations

Keep an eye for Department emails announcing more sessions!

Maynooth University Department of Geography
National University of Ireland Maynooth
Maynooth
Co Kildare

Ollscoil Má Nuad Rionn na Tíreolaíochta
Ollscoil na hÉireann Má Nuad
Má Nuad
Co Chilldara