



Department of Geography

MSc. IN GEOGRAPHICAL INFORMATION SYSTEMS AND REMOTE SENSING

COURSE HANDBOOK

2020-2021

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1. WELCOME TO THE DEPARTMENT OF GEOGRAPHY



Welcome to Maynooth Geography and to the MSc in GIS/Remote Sensing. This is the longest-established such course in Ireland. You join a group of scholars with an international reputation. At Maynooth Geographic Information Science is considered very broadly and you will work with people who are developing applications for Health Geographies and for Spatial Statistics. Maynooth geographers are pioneering new techniques of remote sensing thereby preparing you to enter your profession at the highest levels. Virtually all our graduates find employment and the placement element within your degree gives you valuable experience and priceless contacts. We are proud of the work we do here and soon I hope you will be too.

The external assessors of our work regularly praise the quality of work produced by Maynooth's graduate students in GIS/Remote Sensing. You are working at the research frontier and can expect speculations in one class to become hypotheses for published work later in the year. It's an exciting prospect for you. So please do follow the tradition of earlier MSc GIS/Remote Sensing students of being marvellous departmental citizens, attending department seminars, supporting department publications in the Department blog and in our staff-student publication, Milieu.

If you see me around, stop and say hello,

With best wishes,

A handwritten signature in black ink, appearing to read 'G. Kearns', written over a thin yellow horizontal line.

Gerry Kearns, Head of Department

2. IMPORTANT DATES

First Semester

Monday 28th September 2020: Lectures commence; Postgraduate Reception (October 1st)
Monday 26th to Friday 30th October 2020: Study Week
Friday 18th December 2020: Conclusion of First Semester Lectures
Monday 21st December 2020 to Friday 1st January 2021: Christmas Vacation
Monday 4th – Friday 22nd January 2021: Examination period (No classes)
January 25th to 29th 2021: Inter-Semester Break

Second Semester

Monday 1st February 2021: Start Semester 2; Lectures resume
Monday 15th March to Friday 19th March 2021: Study Week
Friday 2nd to Friday 9th April 2021: Easter Vacation
Friday 7th May 2021: Conclusion of Second Semester
Monday 10th May 2021: Earliest start date for work placement
Friday 30th July 2021: 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 environment*. 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.

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 2020/21. 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 applied and theoretical aspects of GIS and Remote Sensing. This handbook is intended to be the first point of reference for module overviews and assessment 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. Ronan Foley). Students are encouraged to actively participate in all lectures, 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 will:

Remote Sensing Component

- To understand the main physical principles behind remote sensing.
- To understand the operation of the main airborne and space-borne remote sensing systems currently being employed.
- To understand the applications of RS spatial data within information technology spheres.
- To be trained in satellite image analysis and interpretation.
- To understand the concepts of digital image processing and acquire digital image processing skills.
- To have gained computer modelling skills for a range of state-of-the-art programs.

Geographical Information Systems 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 2021

| | | | |
|----------------------|---|---------------|--|
| Dr. Ronan Foley | Course Leader/GIS S1 Office Hours: 10.30-12 Tuesday; 2.30-4 Thursday | R 12 Rhetoric | Ronan.Foley@mu.ie Phone: 01 708 6024 |
| Dr. Conor Cahalane | Lecturer/RS S1 Office Hours: 1-2 Monday; 1-2 Tuesday | R 7 Rhetoric | Conor.Cahalane@mu.ie Phone: 01 708 3748 |
| Prof. Chris Brunsdon | Head of NCG | R2.20 Iontas | Christopher.Brunsdon@mu.ie Phone: 01 708 6149 |

Other Teaching Staff

| | | | |
|---------------------|--------------------|--------|--|
| Hao Wu | Dept. Of Computing | Eolas | haowu@cs.nuim.ie |
| Emlyn Hegarty-Kelly | Dept. Of Computing | Eolas | emlyn.hegartykelly@mu.ie |
| Peter Mooney | Dept. Of Computing | Eolas | peter.mooney@mu.ie |
| Xavier Monteys | INFOMAR | GSI/MI | Xavier.Monteys@gsi.ie |

Support Staff

| | | | |
|----------------|---------------------|----------|----------------------------|
| Michael Bolger | IT Technician | PG Lab | Michael.Bolger@mu.ie |
| Neasa Hogan | Departmental Admin. | Room 23c | geography.department@mu.ie |
| Norma Murphy | Departmental Admin. | Room 23c | geography.department@mu.ie |

Additional Key Contacts

| | | |
|-------------------------|---|--|
| Head of Department: | Prof. Gerry Kearns | gerry.kearns@mu.ie |
| Director of PG Studies: | Dr. Rowan Fealy | rowan.fealy@mu.ie |
| External Examiner: | Dr. Avril Behan (Technological University Dublin) | |

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 three modules (in italics) from which to draw the remaining 10. The programme will be delivered through a variety of different teaching modes including; 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), 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 GIS projects. More details on the individual modules and the thesis portfolio component are listed in Sections 16 and 17 below.

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 postgraduate Marks and Standards via <http://examinations.nuim.ie/documents/MARKSANDSTANDARDSFORPOSTGRADUATECOURSES.pdf>. Please consult the Course Director for more information on repeat options. Typically, there can be, if required, repeat exams in the Autumn. Continuous Assessment grades are usually carried forward, other than in exceptional circumstances.

| | |
|--------------------------|--|
| Total Credit Requirement | 90 Credits (Incorporates 30 Thesis Portfolio Credits+) 80 Compulsory Plus 10 Optional (*From Three) |
|--------------------------|--|

Semester 1

| | | |
|---|----------------|-------------|
| GY641 Aerial Surveys and Drone Operations | Conor Cahalane | 10 Credits |
| GY636 Intro to GI Systems & Science | Ronan Foley | 20 Credits+ |
| * CS620C Structured Programming | Hao Wu | 10 Credits |
| * CS621C Spatial Databases | Peter Mooney | 10 Credits |

| | | | |
|-------------------|---|----------------|-------------|
| * GY672 | Analysing Spatial and Temporal Data using R | Chris Brunsdon | 10 Credits |
| * GY643 | Marine Remote Sensing – Infomar | Xavi Monteys + | 10 Credits |
| <i>Semester 2</i> | | | |
| GY642 | Satellite RS and Earth Observation | Conor Cahalane | 20 Credits+ |
| GY638 | GIS in Practice | Ronan Foley | 20 Credits+ |
| <i>Summer</i> | | | |
| GY635 | Work Placement | External | 10 Credits |

8. COURSE TIMETABLE AND STUDENT COMMUNICATION

The course timetable for semesters one and two are outlined below, all classes will be hosted in Rhetoric House in the Physical Geography Lab (PGL) and in Computer Room 1 (CR1) where required. Other rooms on the timetable include the Rocque Lab (RL) and the Seminar Room in Iontas as well as some field classes and visits across the two University Campuses. The timetable has been organised to allow more than sufficient time for preparation for class and the timely completion of assignments. Students will have priority use of the dedicated computer room. However, the room is also occasionally used for general departmental teaching. Students should use their time in the computer lab as effectively as possible. In addition, it is likely you will carry out more online and home-based laboratory work this academic year and more detail on Covid-19 specific planning is included in Section 9 below.

RS Modules (GY641/GY642)

Semester 1 GY641: Monday 9.00-11.00 and Tuesday 9.00-11.00

Semester 2 GY642: Monday 9.00-11.00 and Tuesday 9.00-11.00

Location: Physical Geography Lab (PGL)

GIS 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

CS/NCG/GSI Modules

CS620C Three-week intensive course prior to formal start (Sep 7th to Sep 25th, 9.30-5)

CS621C 10-12 and 2-3.30 Thursday, Semester 1

GY672 Wednesday 11 am to 1 pm, Semester 1

GY643 Intensive one-week course, January 20th to 25th, Maynooth plus Cork Trip (tbc)

Location: CS Labs on North Campus/Seminar Room; NCG Iontas Building; Rhetoric House; External.

MOODLE

In general, course material is disseminated via the University's virtual-learning environment, Moodle. Each individual module, as well as the course overall, will have an individual Moodle page 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. 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.

9. COVID-19 STATEMENTS

University Procedures: Full documentation and advice on how the University will operate; including advice on interactions and mask wearing on campus are listed on the website and downloadable as a PDF at <https://www.maynoothuniversity.ie/coronavirus/students>. We will upload the PDF on our Moodle pages as well. Please keep an eye on this page as this will be where any immediate changes will be notified.

Departmental Statement: Maynooth Geography taught masters classes next year will be delivered through blended Teaching and Learning. Some classes will be live and be recorded for remote access, some lectures and instructional materials will be on-line. Where possible and safe we will have some classes and labs in person. However, should health reasons prevent any student or member of staff from attending on campus in person, we will make it possible for both students and staff to complete their Teaching and Learning remotely.

Course Statement: If necessary due to Covid-19 restrictions and any associated university closure, the course content can and will be delivered online and will be designed accordingly; using the same timetable as for live classes. For online delivery, lectures will be live-recorded using the lecture capture software, *Panoptico*, and this will be available both during and outside class times. For practicals, these can be worked through remotely with relative ease using a set of manuals across all compulsory and optional modules. We will provide enhanced access to teaching support via MS teams during the normal lab times. We would hope to teach in person as much as we can, but it is a strong possibility

that the semester may end up being a blend of 'live' and online teaching, with as much of the former as is practically possible. 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 practicals, assignments and projects which can be done in college and/or at home. (own text)

Additional Procedures: For as long as public health restrictions and regulations last, we will need to monitor the use of laboratories outside of regular teaching times. At the moment the University is developing a Location App for use on campus using a QR Code methodology which can be used hands-free for entering and exiting rooms and this will also be used for recording presence for contact tracing purposes. Other advice on healthy behaviours on campus are contained in the University guide on Covid-19.

10. COURSE RESOURCES

The course is supported by a range of up-to-date and relevant equipment and resources. These include two dedicated computer laboratories, one with 22 new processors and double monitors with the second lab, with 16 seats, due for upgrade to the same standard in January 2021. These are accessible by swipe card/code. Other hardware includes a large A0 plotter and A4 laser printers. Remote Sensing specialist equipment includes: EbEE RTK Fixed Wing (Digital SLR camera); Parrott Bluegrass Rotary (Multispectral camera); Trimble 5800 GPS Rover (with VRS modem); In addition for students taking the GY643 module this will include a 2-day placement on the Celtic Voyager 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 10 Desktop, ArcGIS Pro and Erdas Imagine, Pix4D and SNAP. In addition, a number of modules use free and open source software and data. We are also part of the National Mapping Agreement with the OSi 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 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 one you are invited to attend the Department of Geography's seminar series which will include some topics which may be of interest. Some of the programme will have a GIS/RS specific component, though there are other potentially relevant speakers as well. The seminar series will 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. It is likely that in Semester 1 these will all be delivered online. The series will introduce students to frontier research/research design in geography and will be delivered by a national or international researcher, who will explicate the methodology they have applied in a specific project. In addition, and of equal relevance, both NIRSA and the NCG run regular Seminar's 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.

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 GIS 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 placements.

The same applies to the NCG, where if anything the GIS components are even more established. The NCG was funded by SFI around 2003 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 the Director, Chris Brunsdon. We will 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. In addition, the NCG, in conjunction with the Department of Computing, run a parallel MSc in GeoComputation, with whom our programme has shared modules.

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% 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 | 20% CA, 30% OPEN BOOK EXAM + THESIS PORTFOLIO 3 (50%) |

SUMMER

| | | |
|----------------------|------------|-------------------------|
| GY635 WORK PLACEMENT | 10 CREDITS | 100% CA (SHORT REPORTS) |
|----------------------|------------|-------------------------|

Please refer to Department of Computing Details for information on assessment weightings on the CS620C and CS621C modules. Please refer to the NCG for information on assessment weightings on the GY672 module. Please refer to the Geological Survey of Ireland teaching team for information on assessment weightings on the GY643 module.

Deadlines (to assist students in their workload planning) are included for guidance below, but please note these may change depending on course. Deadlines for courses not taught by Geography staff are not included:

Semester 1

| | |
|--------------|---|
| 13 October: | GY636: Portfolio 1 (0%, normative only) |
| 19 October | GY641: Practical 1 (0%, normative only) |
| 03 November | GY636: Portfolio 2 (12.5%) |
| 09 November: | GY641: Practical 1 (40%) |
| 24 November: | GY636: Portfolio 3 (12.5%) |
| 30 November | GY641: Practical 2 (40%) |
| 14 December: | GY641: Exam (20%) |
| 18 December: | GY636: Exam (25%) |
| 15 Jan 2021: | GY636: Project (50%) |

Semester 2

| | |
|---------------|--|
| 12 February: | GY638: Project Proposal (2.5%) |
| 15 February*: | GY642: Project Proposal & Presentation (2.5% *Presentation March 1 st) |
| 08 March | GY642 Practical 1 (20%) |
| 12 March: | GY638: Essay (20%) |
| 12 April | GY642: Practical 2 (20%) |
| 23 April: | GY638: Project (47.5%) |
| 30 April: | GY642: Project (47.5%) |
| 3-7 May: | GY638: Exam (Open-Book) (30%) |
| 04 May: | GY642: Digital Exam (10%) |
| 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://www.nuim.ie/courses/?TARGET=CS&MODE=SEARCH>.

14. MISSED ASSESSMENTS/DEADLINES/CLASSES/EXAMINATIONS

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. Given we hope to keep to timetables even during Covid-19 these

broad principles still apply but obviously if people become ill or we need to move to a full online deliver model, we would still stick to our timetable and expect as full and attendance as possible.

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 3% of their overall mark per day for late submissions, 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 include: the name of the student, her/his student number, the title and code of the module, the name of the lecturer who gave the assignment in question; when appropriate, a thematic title for the work; and the total word count of the student's work, along with what percentage the submitted work is over/under the assigned word count. A blank cover sheet will be available on the GY660 webpage (MSc course Moodle page).

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

15. GRADE RELATED CRITERIA

Marking criteria and guidelines used for marking are presented below. These broad guidelines should be read in conjunction with any specific advice on assessment that may be provided by module leader.

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+ | <ul style="list-style-type: none"> - 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. <p>(Reports)</p> <ul style="list-style-type: none"> - 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) | <ul style="list-style-type: none"> - 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. <p>(Reports)</p> <ul style="list-style-type: none"> - 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) | <ul style="list-style-type: none"> - 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 <p style="text-align: center;">(Reports)</p> <ul style="list-style-type: none"> - 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) | <ul style="list-style-type: none"> - 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. <p style="text-align: center;">(Reports)</p> <ul style="list-style-type: none"> - 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) | <ul style="list-style-type: none"> - 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. <p style="text-align: center;">(Reports)</p> <ul style="list-style-type: none"> - 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) | <ul style="list-style-type: none"> - 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. <p style="text-align: center;">(Reports)</p> <ul style="list-style-type: none"> - 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

Feedback will be provided on your coursework both in terms of a numerical grade and 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, but every effort will be made to return work as promptly as possible. In recent years we have tried to record feedback electronically where possible which means it can be returned directly and privately to individual students; it is also a feedback format designed to help communication with the External Examiner

17. AVOIDING PLAGIARISM

All work submitted by a student must be expressed in the student's own words and must incorporate his or her 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.

To avoid plagiarism *direct* quotations from the published or unpublished work of others must 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.

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. The main relevant links are as follows:

ACADEMIC POLICIES AND PROCEDURES

This is 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 five categories with further information under the headings: Academic, Admissions, Examinations, Graduate Studies and Marks & Standards. Clicking on each sub-heading brings up a list of downloadable documents. The main ones of postgraduate interest (with latest update) are:

ACADEMIC:

Teaching & Learning Guidelines (August 2018). This document lists a number of expectations linked to teaching and learning environments including expectations of both students and academic staff.

EXAMINATIONS:

Examination Regulations and Procedures (November 2013). This applies more to formal examinations run by the University but may have some relevance.

Examination checking and appeals procedures (June 2016). Again, focused more on undergraduate processes but information available via the Exams Office.

MARKS AND STANDARDS

Marks and Standards. A document on credits, progression, grades etc., applicable to all undergraduate and postgraduate students, academic year 2020-21 and beyond.

For full information and access to other policies, please click on: <https://www.maynoothuniversity.ie/university-policies>.

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' two years ago. 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 will certainly 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, Professor Karen Till, karen.till@mu.ie.

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, Professor Gerry Kearns, gerry.kearns@mu.ie; or you may contact the Maynooth Student Union Vice President for Welfare and Equality, Ciarán Watts, 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 years. 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)

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)

This module introduces students to GIS Software and the core concepts of GI Science. It is an intensive practical-based module, which is primarily based around the following industry-standard GIS software: ArcGIS and MapInfo. The module seeks to familiarise the students with the software but simultaneously introduces key concepts and analytical approaches within GI science more broadly. This is illustrated through a series of cumulative practical exercises based on a series of GIS applications. The applications are based primarily within the areas of geography, environmental modelling and visualisation. Students will also gain experience of manipulating and understanding digital data files and associated databases in the course of this module.

***CS620C Structured Programming (10)**

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)**

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)**

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 take away 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.

***GY643 Marine Remote Sensing – Infomar (10)**

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.

SEMESTER 2

GY642 Satellite RS and Earth Observation. (20)

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)

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)

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:

Aviva Insurance; Compass Informatics; Coillte Teoranta; County Councils (Various); Demographics Ireland; EraMaptec; ESRI Ireland; Gamma; Geological Survey of Ireland; Government Departments (Various); Icon Group; IRIS Spatial Data Products; Irish Water; Mallon Group; Mapflow; Marine Institute; National Institute of Regional and Spatial Analysis; National Centre for GeoComputation; National Parks & Wildlife Service; Office of Public Works; Ordnance Survey of Ireland; Paradigm; Proteus Solutions; Spatial Data Products; Spectral Signatures; Specterra Services, Teagasc.
Overseas placements: NASA; New York State Water Board; Saudi Arabian Government Departments.

20. 2021 GEOGRAPHY SEMINAR SERIES

2020 (Semester 1 only)

October 1st: Department of Geography Postgrad Welcome (*outside if weather permits*)

October 8th: Niamh Moore-Cherry, UCD. Title: *TBC*

October 22nd: Debangana Bose, Maynooth University "Autogenic Displacement: Beyond Mega Displacement in the Global South".

w/o November 2nd: Mary Gilmartin, Maynooth University. "How to engage with seminars: asking questions and confidence building". Lunchtime Workshop. Venue and Date: *TBC*

- November 5th: Conor Cahalane, Jack French, and Jonathan Faull, Maynooth University "5*S: Space, Surveyors and Students - STEM and the Sustainable Development Goals—an SFI Discover STEM outreach project"
- w/o November 9th: Malene Jacobsen and Sam Grainger. Professional development for early career researchers and teaching staff. Lunchtime Workshop. Venue and Date: TBC
- November 19th: PhD Seminars: Laure Detykowski; Bernard Essel; Conchúr Ó Maonaigh; Jack Callan
- November 26th: PhD Seminars: Samuel Diabaté; Cathal Flood; Catherine O Beirne
- December 3rd: Patrick Bresnihan, Maynooth University. Title: *TBC*
- December 10th: Sam Blanckensee. Lunchtime (1.00pm) Workshop from MU Equality/Diversity Officer. Venue: *TBC*

All seminars (unless otherwise marked) will typically be delivered online from 4:00 to 5.30pm though there will also be some lunchtime slots as well. A second list of Semester 2 seminars, hopefully delivered live and in person in the Rocque Lab, ground floor of Rhetoric House, South Campus, Maynooth University will be circulated later.
YOU ARE WELCOME TO COME ALONG!

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