Remote Sensing and GIS (Online Distance Learning)
PG Certificate / PG Diploma / Masters (Part-Time)

THE COURSE IN DETAIL

Course Summary

This online course delivers contemporary content on remote sensing and GIS integrating theoretical and practical learning activities encompassing acquisition, analysis and interpretation of geospatial data. Course participants will develop skills in a range of areas including:

- o Remote sensing and photogrammetry
- o Analysis of active and passive remote sensing data
- o GIS, spatial data management and analysis
- o Programming for GIS and remote sensing
- o Applications of remote sensing and GIS in marine studies or environmental management

We are an established provider of online distance learning postgraduate courses. With 25 years' experience of teaching GIS, and nearly 20 years via online distance learning, we have a long and successful track record in GIS education. We enjoy imparting knowledge, skills and confidence that enhance employment prospects with our innovative and career-focused modules and research.

Our remote sensing and GIS programme offer flexible learning through part-time education – while each module has coursework deadlines, you study at a time and pace that suits you.

Key Features

- o Access to a fully online course! You can study from almost anywhere and there is no need to travel to classes – choose the times you study each week to suit yourself.
- o Up-to-date skills and experience to deal with geospatial data and methods.
- o A free copy of ArcGIS Pro, the remote sensing package Erdas Imagine, and the data analysis package SPSS.
- o Support and advice from experienced lecturers, tutors, librarians, e-learning and IT staff.
- o Access to online resources such as e-books, digital lectures and podcasts, discussion boards and video-conference tools all within a dedicated e-learning platform.
- o Improved employability, professional and academic skills, and gain extensive hands-on practice with key software.
- o An experience of conducting a substantial independent research project (MSc only), written in the form of a research journal article (which may, with agreement of your supervisor, be submitted for publication).

Teaching, Learning and Assessment

This course is delivered through a teaching platform (Virtual Learning Environment, VLE), called Blackboard, through which we provide teaching materials, assignment instructions, links to electronic library resources and other reading materials, as well as discussion boards and other communication tools. Teaching materials consist mainly of lectures in various formats (e.g. as illustrated documents or podcasts) and practical exercises (written instructions with screenshots or screencasts), which may be supplemented by additional reading or video content, tutorial

exercises, quizzes, etc. The format of delivery provides you with the flexibility to study at your own pace, any place and at any time, and you are not required to attend the campus at any stage during the course. Once registered, you will be able to use the University's extensive online library resources of electronic journals, e-books and databases. In addition, you will also gain access to different remote sensing, GIS and statistics software packages.

Learning is supported by lecturers and e-tutors via discussion forums, email, phone or video-conferencing tools. Discussion forums encourage participation from the whole class and offer opportunities for you to learn about issues and problems from different perspectives as well as getting to know your fellow students.

Assessment involves a mixture of methods including practical reports, problem analysis, research projects, presentations, blogs, online tests and group work. The Master's element of the course takes the form of a substantial independent research project, written up in the form of an academic paper, which may subsequently be considered for submission to a scientific journal. You will be assessed by coursework only and there are no sessional examinations.

Course Start Date and Module Timings

There is one intake onto the course in September each year.

Teaching takes place between late September and mid-December (Semester 1) and late January to the end of April (Semester 2); please note that coursework deadlines may extend until early January (Semester 1) and mid-May (Semester 2). Module timings are shown below:

Year 1, Semester 1 (September start)			Pre-requisite(s)
Weeks 1-6	EGM713	Introduction to Remote Sensing (15 credits)	None
Weeks 7-12	EGM711	Principles of GIS (15 credits)	None
Year 1, Semester 2 (January start)			
Weeks 1-6	EGM702	Photogrammetry and Advanced Image Analysis (15 credits)	EGM713
Weeks 7-12	EGM722	Programming for GIS and Remote Sensing (15 credits)	None
Year 2, Semester 1 (September start)			
Weeks 1-6	EGM703	Advanced Active and Passive Remote Sensing (15 credits)	EGM713
Weeks 7-12	EGM712	Spatial Data Management (15 Credits)	EGM711
Year 2, Semester 2 (January start) (Any two)			
Weeks 1-6	EGM716	Spatial Data Analysis (15 credits) OR	EGM711 & EGM712
Weeks 1-6	EGM715	Web-based GIS (15 credits)	None
Weeks 7-12	EGM705	Marine Remote Sensing (15 credits) OR	EGM713
Weeks 7-12	EGM721	GIS for Environmental Management (15 credits)	EGM711 & EGM712
Year 3, Semesters 1 and 2			
	EGM704	Remote Sensing and Geographic Information Systems Project (60 credits)	PgDip

PG Certificate: Complete year 1 modules
PG Diploma: Complete years 1 and 2 modules
MSc Degree: Complete PG Diploma and Masters Project

Module Summaries

Please note that module content is reviewed and updated on an annual basis and the content described here is subject to minor modifications.

Year 1, Semester 1

EGM713 Introduction to Remote Sensing (Weeks 1-6)

This postgraduate module offers students the opportunity to study the principles and applications of remote sensing and image analysis and to explore links between remote sensing and GIS. Students will become familiar with theoretical foundations of remote sensing and will develop technical skills through a series of software-based practical exercises and assignments using Erdas Imagine.

EGM711 Principles of GIS (Weeks 7-12)

This module introduces the theory and practice of Geographic Information Systems, and is intended to provide an understanding of the breadth of potential GIS applications and to equip students with key concepts and skills relating to the input, management, manipulation, analysis and output of spatial data. Lecture-based teaching of key concepts is reinforced by linked practical exercises which allow students to develop competence in ESRI's ArcGIS package. The module assumes no prior knowledge or experience of GIS.

Year 1, Semester 2

EGM702 Photogrammetry and Advanced Image Analysis (Weeks 1-6)

This module covers advanced topics in visible remote sensing and image analysis, including photogrammetry and digital elevation models, image processing and manipulation, advanced classification techniques such as object-based image analysis (OBIA), and time series analysis using Google Earth Engine. It builds on the topics covered in EGM713, complements the topics covered in EGM722, and provides a foundation for further study in remote sensing.

EGM722 Programming for GIS and Remote Sensing (Weeks 7-12)

This module develops programming skills using the python programming language. The module seeks to provide students with key skills in the development of repeatable, automated analyses of GIS applications. The module also aims to develop academic writing skills in preparation for the MSc degree.

EGM703 Advanced Active and Passive Remote Sensing (Weeks 1-6)

This module covers advanced topics in active and passive remote sensing, including the highly sought-after topics of hyperspectral and microwave remote sensing, covering both active and passive microwave applications. It also covers thermal and below-surface (i.e., ground-penetrating radar) remote sensing techniques. It builds on the topics introduced in EGM713 and provides a framework for more detailed modules covered later in the course, as well as the (optional) research topic.

EGM712 Spatial Data Management (Weeks 7-12)

This module builds on the knowledge and practical skills gained in EGM711 to provide students with further experience in the acquisition, manipulation and analysis of spatial data. Methods for generating and collecting digital spatial data from primary and secondary sources are considered, and data processing, selection, integration and analysis extensively practiced. Lecture and practical sessions include digitising, geo-registration, GPS, accessing and using secondary sources, spatial join and overlay, network analysis and 3D modelling, and incorporate experience of a variety of large and small scale vector and raster datasets. The module also incorporates practice in statistical analysis and interpretation. Development of GIS software skills focuses on ArcGIS and extensions.

Year 2, Semester 2 (Any two modules; EGM716 or EGM715, and EGM705 or EGM721

EGM716 Spatial Analysis (Weeks 1-6)

This module builds on the introductory material of EGM711 and EGM712, covering advanced concepts of spatial data analysis and modelling, and providing extensive practical experience of ESDA and spatial analysis and modelling within a GIS environment.

EGM715 Web-based GIS (Weeks 1-6)

This module examines the role of programming within the GI industry. It aims to enable students to appreciate the need for programming skills that can be used to customise and develop applications. A range of programming skills is introduced which equip the student with knowledge of the potential and scope of programming within various applications.

EGM705 Marine Remote Sensing (Weeks 7-12)

This module first introduces the underlying concepts of marine remote sensing and its applications within the framework of ocean properties and seafloor characteristics. It introduces students to different datasets and spatial data management tools for ocean remote sensing and aim to help them develop an appreciation of mapping scales, data resolution and density. Lastly the module focuses on the effective integration of relevant datasets in the context of specific users' and stakeholders' requirements. The module is a combination of theoretical and practical based sessions using both commercial and open source software. Guest lectures and contributions from world-leading experts in the field will form an integral component of the module.

EGM721 GIS for Environmental Management (Weeks 7-12)
This optional module examines the application of GIS to environmental management, modelling and impact assessment. It aims to enable students to appreciate the need for properly researched information to support strategic and operational environmental management decisions, and to be aware of the means by which such information can be obtained and evaluated.

Year 3, Semester 1 and 2 (MSc)

EGM704 Remote Sensing and Geographic Information Systems Project
This module provides students with the opportunity to undertake a substantial piece of research in an area of particular interest to the student. The student will be assessed on their project proposal and two progress reports, together with the final research paper.

Fees

Details on fees and funding options can be seen at:
https://www.ulster.ac.uk/study/postgraduate/fees.

Applying for the course

You can apply online at www.ulster.ac.uk/study/postgraduate/apply. Please ensure that you include full details of qualifications and work or other relevant experience.

Contact Us

If you have any additional queries relating to any aspect of the course, please e-mail the Course Administrator Niamh McInerney (n.mcinerney@ulster.ac.uk) or the Course Director Saad Bhatti (s.bhatti@ulster.ac.uk).