ENV 808

Introduction to Geographic Information Science for Postgraduates

S1 External 2014

Dept of Environment & Geography

Contents

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General Information

Unit convenor and teaching staff
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Lecturer
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Credit points
4

Prerequisites
Admission to MA in Human Geography or PGDipArts in Human Geography or PGCertArts in Human Geography or MEnv or PGDipEnv or PGCertEnv or MEnvEd or PGDipEnvEd or PGCertEnvEd or MEnvMgt or MEnvPlan or MEnvSc or MEnvStud or MSusDev or PGDipSusDev or PGCertSusDev or MSc in (Biodiversity Conservation or Remote Sensing and GIS) or PGDipSc in (Biodiversity Conservation or Remote Sensing and GIS) or PGCertSc in (Biodiversity Conservation or Remote Sensing and GIS)or MWldMgt or PGDipWldMgt

Corequisites

Co-badged status

Unit description
Many professionals in the broad areas of environmental science, management and planning use geographic information systems (GIS) to analyse and map spatial information. This unit is an introductory GIS unit for postgraduates. It is designed for the students who have not previously undertaken ENV264 or its equivalent. It covers the underlying concepts of GIS, applications, the use of commercial GIS software, and will develop for students a GIS skills set. The practical program focuses on the basics of GIS analysis methods and map creation. The GIS software used is ArcGIS. Students enrolling in this unit must have access to a computer with Windows operating systems. Mac or Linux systems will not be supported.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

Understand the underlying principles of spatial science

Be able to implement these concepts in a workplace

Have a wide knowledge of basic GIS techniques

Be able to adapt standard GIS procedures to new contexts

Accurately analyse and interpret spatial data

Effectively communicate the results of the analysis of spatial data, and adhere to
scientific conventions in written reports

Have a knowledge of GIS applications across a broad user community

Have a thorough foundation in spatial science on which to build lifelong learning

Assessment Tasks

Name	Weighting	Due
Assignment 1	15%	Thursday, 3 Apr, 11.59AM
Assignment 2	15%	Thursday, 8 May, 11:59AM
Assignment 3	25%	Thursday, 29 May, 11:59AM
Assignment 4	10%	Weeks 6 and 12
Final Exam	35%	Check exam timetable

Assignment 1

Due: **Thursday, 3 Apr, 11.59AM**
Weighting: **15%**

A short report on the week 3 - 4 practical exercises on analyzing spatial information.

On successful completion you will be able to:

• Understand the underlying principles of spatial science

• Have a wide knowledge of basic GIS techniques

• Be able to adapt standard GIS procedures to new contexts

• Accurately analyse and interpret spatial data

• Effectively communicate the results of the analysis of spatial data, and adhere to

scientific conventions in written reports

- Have a knowledge of GIS applications across a broad user community

Assignment 2

Due: **Thursday, 8 May, 11:59AM**
Weighting: **15%**

A short report on the week 5 - 7 practical exercises on data preparation and mapping.

On successful completion you will be able to:
- Understand the underlying principles of spatial science

- Have a wide knowledge of basic GIS techniques

- Be able to adapt standard GIS procedures to new contexts

- Accurately analyse and interpret spatial data

- Effectively communicate the results of the analysis of spatial data, and adhere to scientific conventions in written reports

- Have a knowledge of GIS applications across a broad user community

Assignment 3

Due: **Thursday, 29 May, 11:59AM**
Weighting: **25%**

A report on the week 9 - 11 practical exercises on a major GIS project.

On successful completion you will be able to:
- Understand the underlying principles of spatial science

- Be able to implement these concepts in a workplace

- Have a wide knowledge of basic GIS techniques

- Be able to adapt standard GIS procedures to new contexts

- Accurately analyse and interpret spatial data

- Effectively communicate the results of the analysis of spatial data, and adhere to scientific conventions in written reports

- Have a knowledge of GIS applications across a broad user community

- Have a thorough foundation in spatial science on which to build lifelong learning

Assignment 4

Due: **Weeks 6 and 12**

Weighting: **10%**

Two short quizzes on lecture topics.

On successful completion you will be able to:

- Understand the underlying principles of spatial science

- Have a wide knowledge of basic GIS techniques

- Accurately analyse and interpret spatial data

Final Exam

Due: **Check exam timetable**
Weighting: **35%**

Final exam covering all aspects of the unit.

On successful completion you will be able to:

- Understand the underlying principles of spatial science

- Have a wide knowledge of basic GIS techniques

- Accurately analyse and interpret spatial data

Delivery and Resources

This unit is offered both internally and externally.

Lecture program and location

There is one 1 hour lecture per week. Please check lecture times and rooms at the Macquarie University timetables website (www.timetables.mq.edu.au). Lectures are recorded and posted to iLearn via Echo360. Internal students are expected to attend lectures and practicals in person; external students can access lectures through iLearn.

Practical program and location

Internal students: There is one 3 hour practical class per week. Please check practical times and rooms at the Macquarie University timetables (www.timetables.mq.edu.au). Practicals begin in Week 2.

External students: You MUST have a home computer with a Windows 8, 7, Vista or XP operating system. A copy of the ArcGIS software will be sent to all external students. You must install this software on your

computer. Other computer operating systems, e.g. Mac and Linux, are not supported. External students resident in Sydney are required to attend a one-day (Saturday) on-campus session in Week 9 (May 17).

Submission of assignments

All students are required to keep a backup of the submitted version of their assessments.

Students are NOT permitted to email their assignments. Assignments are to be submitted via the link provided on iLearn. Assignments are to be submitted in softcopy either in MS Word or PDF file format by 11.59AM on the date specified and must include a completed and signed coversheet attached to the front cover. Please download your personalised coversheet from: http://web.science.mq.edu.au/intranet/lt/barcode/coversheet.php

Maps and tables must be incorporated in the assessment's Word document or PDF.

How do I request an extension?

Extensions must be requested by email from the unit convenor, Michael Chang (michael.chang@mq.edu.au), prior to the assignment's due date (except in exceptional circumstances), and supported by appropriate documentation (e.g. a medical certificate).

Extensions will only be granted in writing (by email) at the discretion of the unit convenor. Otherwise, automatic penalties will apply. Assignments that are handed in late without an extension or exceptional circumstances will not be marked if they are submitted more than 7 days after the due date. If submitted within 7 days, marks will be deducted for lateness at the rate of 5% of the possible mark per day.

Return of marked assignments

The grade and comments of your assignments will be returned via iLearn within two teaching weeks of the submission, and will include written feedback.

Requirements to complete this unit satisfactory

1. Attend lecture and practical classes (internal students);

2. Complete all assignments and the final exam; and

3. Acquire a pass grade or above.

Grades for the unit as a whole will be awarded according to the following general criteria (course rubric).

	Developing	Functional	Proficient	Advanced

General description of the level of attainment	Has not yet reached the desired standard. Limited understanding of required concepts and knowledge. A **fail** grade (or under some circumstances a conceded pass) would be given.	Has reached basic academic standards. Work has limited translation of concepts and procedures to new contexts unless aided. A **pass** grade would be awarded.	Has completely reached the standards expected. Can work independently in new contexts, adapting procedures to meet the context. Demonstrates awareness of own limitations. A **credit** grade would be awarded.	Has gone beyond the expected standards. Exhibits high levels of independence and can use concepts to generate new ways of completing procedures. Can engage in critical reflection. A grade of **distinction** or **high distinction** would be awarded.

List of changes

The assignment 1, a short report, given last year is replaced by two short quizzes on lecture topics, and some lectures are modified in both content and schedule of delivery.

Resources

Technology used

This unit will use Echo360 and iLearn, and ArcGIS, Google Earth and MS Excel software, and GPS for the practical exercises.

You will require access to a computer and the broadband internet to complete this unit. The library computers and computer labs are available for casual use outside scheduled practical classes.

Internal students who have a home computer with a Windows 8, 7, Vista or XP operating system may obtain a copy of the ArcGIS software from the unit convenor. The ArcGIS software is NOT supported by Mac or Linux operating systems. It is not essential for internal students to have ArcGIS installed on their home computer as the computers in the computer labs are available for casual use outside scheduled practical classes. However, external students must have ArcGIS installed on their home computer.

Unit web page

This unit's webpage will be available on iLearn.

Information about how students can access iLearn can be found at: http://www.mq.edu.au/iLearn/student_info/index.htm

The iLearn page uses Macquarie University's standard interface and has links, access to lectures (as audio files through Echo360, and as downloadable PDF presentations) and practical instructions. Important announcements will be made through iLearn, so check the ENV808 page regularly.

Information about how to access lecture recordings through the Echo360 EchoCenter page in iLearn can be found at: http://mq.edu.au/iLearn/student_info/lecture_recordings.htm

Required and recommended texts/materials

There are no prescribed texts for this unit. However, there will be recommended reading associated with some lectures.

Recommended text:

Kang-tsung Chang 2008. Introduction to geographic information systems, McGraw Hill, New York. [Available at Macquarie University Library]

Unit Schedule

Week	Lecture Topic	Lecturer	Practical
1	Introduction to ENV808	M. Chang	No practical
2	GIS applications and software demonstration	A. Grech	Getting started with GIS
3	Coordinate systems and map projections	A. Grech	Analysing spatial information 1
4	How to make a map?	A. Grech	Analysing spatial information 2
5	Spatial analysis with vector data	A. Grech	Data capture - GPS
6	Creating digital data	A. Grech	Data capture – Georeferencing and digitizing

7	Spatial analysis with raster data	M. Chang	Preparation and presentation of maps
8	3D GIS	M. Chang	GIS analysis and model builder
9	Introduction to major project	M. Chang	Major project
10	Temporal analysis	M. Chang	Major project
11	Remote sensing 1	M. Chang	Major project
12	Remote sensing 2	M. Chang	Remote Sensing
13	Summary	M. Chang	No practical

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy.html

Grading Policy http://mq.edu.au/policy/docs/grading/policy.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://informatics.mq.edu.au/help/.

When using the University's IT, you must adhere to the Acceptable Use Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Understand the underlying principles of spatial science
- Be able to implement these concepts in a workplace

- Have a wide knowledge of basic GIS techniques

- Be able to adapt standard GIS procedures to new contexts

- Accurately analyse and interpret spatial data

- Have a knowledge of GIS applications across a broad user community

- Have a thorough foundation in spatial science on which to build lifelong learning

Assessment tasks

- Assignment 1

- Assignment 2

- Assignment 3

- Assignment 4

- Final Exam

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Understand the underlying principles of spatial science

- Be able to implement these concepts in a workplace

- Have a wide knowledge of basic GIS techniques

- Be able to adapt standard GIS procedures to new contexts

- Accurately analyse and interpret spatial data

- Effectively communicate the results of the analysis of spatial data, and adhere to scientific conventions in written reports

- Have a thorough foundation in spatial science on which to build lifelong learning

Assessment tasks

- Assignment 1

- Assignment 2

- Assignment 3

- Assignment 4

- Final Exam

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- Understand the underlying principles of spatial science
- Be able to implement these concepts in a workplace
- Have a wide knowledge of basic GIS techniques
- Be able to adapt standard GIS procedures to new contexts
- Accurately analyse and interpret spatial data
- Effectively communicate the results of the analysis of spatial data, and adhere to scientific conventions in written reports
- Have a knowledge of GIS applications across a broad user community
- Have a thorough foundation in spatial science on which to build lifelong learning

Assessment tasks

- Assignment 1
- Assignment 2
- Assignment 3
- Final Exam

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- Be able to implement these concepts in a workplace
- Be able to adapt standard GIS procedures to new contexts
- Effectively communicate the results of the analysis of spatial data, and adhere to scientific conventions in written reports
- Have a knowledge of GIS applications across a broad user community

Assessment tasks

- Assignment 1
- Assignment 2
- Assignment 3
- Final Exam

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcomes

- Effectively communicate the results of the analysis of spatial data, and adhere to scientific conventions in written reports
- Have a knowledge of GIS applications across a broad user community

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

- Be able to implement these concepts in a workplace
- Have a wide knowledge of basic GIS techniques
- Be able to adapt standard GIS procedures to new contexts
- Effectively communicate the results of the analysis of spatial data, and adhere to scientific conventions in written reports
- Have a knowledge of GIS applications across a broad user community

Assessment tasks

- Assignment 1
- Assignment 2
- Assignment 3
- Assignment 4

- Final Exam

Changes since First Published

Date	Description
22/01/2014	The Prerequisites was updated.

Changes since First Published