DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL MANAGEMENT AND ENERGY STUDIES

Faculty of Science | University of Johannesburg

An Introduction to Geographical Information Systems

Instructors	Office	Consultation Times	Email
Jeff Lash	D2 Lab 334	by appointment	jlash@uj.ac.za
Thendo Mugwena	D3 Lab 329	by appointment	thendom@uj.ac.za
Arno Booyzen		by appointment	arnobooyzen@hotmail.com
Emmanuel Fundisi	D2 Lab 344A	by appointment	fundisye@icloud.com
William Mushawemhuka	D2 Lab 335	by appointment	williamjm@uj.ac.za

Introduction[1]

The use of geographical information systems (GIS) technology is spreading in education. Educators recognize that visualizing places and data on computer maps and analysing the spatial or geographic arrangement of phenomena facilitates learning.

Access to sophisticated GIS maps, data, and tools is within the reach of greater numbers of learners through Information Communication Technology (ICT). Many educators, however, remain unsure about how to engage learners with GIS.

While a basic understanding of GIS technology and science are incorporated into this course, the focus is on teaching regular academic subjects with GIS. The goal of this course is to build your confidence and to quickly prepare you to use GIS in your own classroom.

Leaning Objectives

After successfully completing this course, you will be able to:

- Help learners visualize local, regional, and global data and make connections to their own environment.
- Choose appropriate GIS classroom activities based on your instructional goals, available resources, and learners' levels of knowledge.
- Guide learners through a standard Geo-Inquiry process using GIS.
- Use ArcGIS Online to explore, search, and analyse maps.
- List and distinguish the five levels of instructional GIS.
- Develop a short map-centered classroom presentation using ArcGIS Online

Assessment

Assessment of your learning in this course will consist of 10 practicals (10 marks each) and 2 tests (25 marks each) for a total of 150 marks. Each practical will present background information, step-by-step instructions, and learning resources. This format is designed to encourage you to be self-reliant and inquisitive when performing GIS operations. The tests will consist of problem-solving tasks using GIS knowledge and skills.

---

[1] This course has been developed using numerous resources including: the online "Teaching with GIS" course by ESRI; the "Fundalula" curriculum by ESRI South Africa; and the "Geo-Inquiry" process by National Geographic.

Schedule

The following schedule will guide our practical sessions. Please note that this is a general guide and is subject to modification. You will be notified in advance of any changes.

Date	Practical Topic	Learning Objectives *After successful completion of this practical, you will be able to:*
6 April	1. Exploring GIS Maps	• Access GIS maps using a web browser • Use ArcGIS Online to explore Earth's geography
13 April	2. Geo-Inquiry with ArcGIS Online	• Think like a geographer • Collect and visualize geographic information
4 May	3. Cartographic Principles	• Explain how maps are constructed • Explain how and why maps use symbols
18 May	4. Thematic Maps	• Create thematic maps • Interpret thematic maps
25 May	5. Remote Sensing	• Interpret remotely sensed images
1 June	Test 1	
13 July	Revision	
20 July	6. Exploring GeoInquiry Activities	• Access existing ArcGIS Online activities • Demonstrate competence with ArcGIS Online tools
27 July	7. Mapping 1	• Map a current event using ArcGIS Online
3 August	8. Mapping 2	• Add content to an ArcGIS Online map
10 August	9. Mapping 3	• Configure and share an ArcGIS Online map
24 August	10. Teaching with GIS	• Articulate a plan to implement GIS in your classroom
31 August	Test 2	