**ENV 2213 Principles of Geographical Information Systems (4CU)**

**Description**

This is an introductory course to Geo-Information Systems (GIS). It explains the basic principles and applications of GIS to different environments.

**Objectives**

The course will help the students to achieve the following objectives

* Understand the basic concepts of GIS
* Describe the different GIS techniques that are applicable in the environment

**Learning outcomes**

By the end of the course students should be able to;

* Explain the basic principles of GIS
* Describe the different components and their functions in a GIS system
* Explain data handling techniques in a GIS environment

**Intellectual, Practical and transferable skills**

* Problem solving
* Analytical
* communication

**Teaching and learning patterns**

The mode of learning involves direct contact with students in form of lectures, Tutorials and assignments

**Indicative content**

* The basic principles of geographical information systems including: the concept of spatial data, digital representation of spatial data, description of spatial data and spatial data characteristics.
* GIS as a system, components and functions of GIS and spatial data relationships in a GIS.
* Spatial data models (roster & vector), topology, spatial data manipulation, classification and type of spatial analysis.
* Spatial data entry through digitizing, establishment of topology and geometric data editing, coordinates systems, projections and geo-referencing. Attribute data handling and spatial data queries.
* Basic analytical GIS technique including buffering and topological overlays. Data visualization using appropriate cartographic standards.
* The case studies with elements of geo-referencing, digitizing editing, basic analysis and visualization.

**Assessment Method**

The assessment method is structured to include course work, and final examination. Course work consists of assignments, reports and tests and accounts for 30% of the final grade. The final examination will account for 70% of the final grading

# Core Reference materials

# Nadine Schuurman (2004): GIS: a short introduction, *Blackwell publishing*

# Michael Kennedy (2002): The global positioning system and GIS: an introduction: Volume 1, *Ann Arbor Pr Inc*

* **Kang-Tsung Chang** (2006): Introduction to Geographical Information Systems, *McGraw-Hill*