CC305 - GIS for Natural Resource Management Course

Course Duration: 10 Days
Training Fee: KSH 80,000 | USD 800
Course Registration: **Register Here>>**

1.0. Introduction

The demands for better management of natural resources require management of spatial data and information. Geographic Information Systems (GIS) refer to the broad collection of Information Management Techniques, which store and analyze such information to contribute to the needs for planning and resource management. The use of GIS has produced remarkable changes in the way and rate at which georeferenced data are produced/created, updated, analyzed and disseminated, making production and analysis of geographic information very efficient. Natural resource managers — biologists, botanists, ecologists, environmental regulators, hydrologists, planners, petroleum engineers, foresters, and farmers — rely on the analytical power of GIS for help in making critical decisions to manage the earth's resources.

1.1. Course Overview

More than ever in history, we must manage, preserve, and restore our natural resources, and decision makers who must act, need a complete picture of the issues. GIS platform helps you gain a deeper understanding of the problems we face and lets you bring more accurate information and less guesswork to the table. There is no simple answer to our environmental and natural resource concerns, but whether its is about restoring habitats, planting crops, drilling for oil, or monitoring endangered species there is increasing optimism that the application of GIS tools will help become a more sustainable planet. This course will focus on using GIS to analyze land resource and all those resources attached to land e.g. forests, water etc. In natural resource management realm, GIS and remote sensing is mainly used in the mapping process. These technologies can be used to develop a variety of maps e.g. Land cover maps, Vegetation maps, Soil maps, Geological maps etc.

1.2. Course Content/Outline

i. **Overview of Natural Resources:** Introduction to all-natural resources; land resources; water resources; mineral resource, forestry management; environmental management, biodiversity management etc.
ii. **GIS Technology on Natural Resource Management:** GIS tools for natural resource management; use of aerial photos, drone and satellite images; Digital Elevation Models (DEMs); the GIS databases; GIS spatial analysis.
iii. **GIS and Remote Sensing in Forest Management:** Use of remote sensing and GIS data to generate information with regards to forest cover, types of forests, human encroachment into forest land/protected areas, encroachment of desert like conditions among others.

iv. **GIS Data in Watershed Management:** Use of satellite data and GIS technology to map water bodies and resources such as rivers, lakes, dams & reservoirs in 3D GIS environment.

v. **Geospatial Data in Combating Desertification:** Application of Geospatial data to map soil types; Use of GIS data to determine the land use practices within a given area; Use of GIS to determine slope information of an area.

vi. **GIS Data in Biodiversity Management:** Geospatial data e.g. satellite images to manage of flora and fauna within protected areas; Use of aerial and satellite photographs to determine the presence and distribution of vegetation within a protected area; use of aerial photos to determine presence and distribution of invasive species within ecosystem.

vii. **Environmental Impact Assessment:** Carrying out Spatial Multi-criteria Evaluation (SMCE) on projects such as building of roads, buildings, pipe ways, dams, and so on might have various effects on an ecosystem.

1.3. Expected Learning Outcomes

On completion of this course, the participants are expected to:

i. Apply the geo-information and earth observation techniques in support of sound and effective natural resources management in a given locality.

ii. Acquire knowledge and skills needed for the collection, interpretation, and management of spatial information, using remote sensing and geographic information systems, to support planning and decision-making processes in natural resources management.

iii. Acquire skills in Geospatial tools that help in maintaining sustainability of natural resources, environment management.

iv. Obtain the insights on Modern day geo-technologies e.g. GIS for Environmental Management to help in understanding the effects on the environment from an inter-disciplinary aspect.

v. Get acquainted with forestry GIS and other techniques to provide project specific solutions in the field of forest management, watershed management, desertification combat, biodiversity management, environmental monitoring and wildlife habitat encroachment.

1.4. Training Tools (Hardware and Software)

1. Handheld GPS;
2. A Laptop;
3. Satellite images;
4. Drone images;
5. ENVI Software;
6. ArcGIS & Q-GIS;

1.5. Training Style and Approach

- On-site instructor-led training;
- On-line self-paced training (optional);
- Use of PowerPoint Slides;
- Fieldwork Project & use of Case Study Videos.