

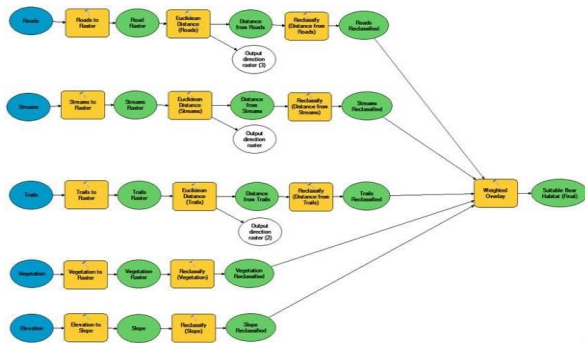
## AC205 - Advanced Spatial Analysis and Workflows Course

Course Duration: 7 Days

Training Fee: KSH 56,000 | USD 560

Course Registration: [Register Here>>>](#)

### 1.0. Introduction



GIS **Spatial analysis** is a way of looking at the geographical patterns of data and analyzing the relationships between the entities. It is a fundamental component of a GIS that allows for an in-depth study of the topological & geometric properties of a dataset or datasets. Multiple kinds of layer analysis such as single and multiple layer analysis can be performed on both vector and raster data. Raster data (where spatial data is represented as cells/pixels) is particularly suited to

certain types of analyses including Geoprocessing operations, different kinds of surface analysis as well as terrain mapping. While not always true, raster data can simplify many types of spatial analyses workflows that would otherwise be overly cumbersome to perform on vector datasets.

### 1.1. Course Overview

This module introduces learners to the basic and intermediate spatial analysis techniques for raster and vector datasets. Learners will be introduced to how single and multiple raster and vector geoprocessing techniques, querying techniques as well as surface analysis can be applied to real life phenomena to offer solutions that can guide policy makers.

### 1.2. Course Objectives

- To have an in depth understanding of basic vector data analysis.
- To have an in depth understanding of basic raster data analysis.
- To have skills in automating GIS workflows with Model builder and Python.

### 1.3. Course Content/Outline

#### Vector Analysis

- Introduction to Analysis tools and ArcToolbox;
- Proximity analysis; buffering, near and point distance, Thiessen polygons;
- Overlay analysis; erase, intersect, spatial join, update, union, symmetrical difference);
- Extract (clip, select, split, table select).
- Geoprocessing in GIS;
- Getting started with Model Builder; Creating, Editing and running a model

#### Filtering Data using Queries

- Selection by attribute
- Queries and Venn Diagrams

- Selection by location
- Selection by attribute and location in ArcMap
- Reclassification and aggregation

### Raster Analysis

- Raster overlay operations; mathematical, Boolean, or relational operators to create new output datasets.
- Focal, Zonal and Global raster operators
- Raster reclassification/ recoding
- Surface Analysis: Spatial Interpolation; spatial autocorrelation
- Surface analysis: Terrain Mapping; slope maps; aspect maps; hillshade maps; viewshed analysis; watershed analysis, suitability Analysis
- Case Study 1: Suitability Map of waste disposal Points in Gikomba Area
- Case Study 2: Preliminary assessment of access to water (boreholes) in rural areas of ASALS in Kenya.

#### 1.4. Case Studies: Advanced Spatial Analysis of Nyeri Water Company Data

#### 1.5. Expected Outcomes

At the end of this module, learners are expected to:

- Understand the various analysis tools that can be applied to vector data
- Understand how local, neighborhood, zonal and global analyses can be applied to raster datasets
- Be proficient in undertaking raster and vector analyses to solve real life problems

#### 1.6. Training Material (Hardware and Software)

- ArcGIS/QGIS
- A Laptop or PC

#### 1.7. Who should attend

Anyone who wants to learn about mapping and GIS including:

- GIS/Geospatial Students;
- Urban/Spatial Planning Professionals;
- Regional Planning;
- Bodies e.g. UNHABITAT;
- Ministry of Urban Development;
- Urban Transport Sector
- Health Professionals
- Civil Engineering Industry