About the course

This introductory course familiarizes learners with the essentials of GIS, including its fundamental components, data types, and practical applications in diverse fields such as environmental science, agriculture, disaster management, and urban planning. The course features a practical demonstration of QGIS, a widely-used open-source GIS program, allowing participants to gain experiential knowledge in managing geographical data, cartography, and analysis.

Learning Objectives

- Define GIS and explain its practical use.
- GIS system components should be understood.
- Vector and raster data models differ.
- Discover GIS mapping, analysis, and visualization.
- Find popular GIS applications, focusing on QGIS.
- Use QGIS to practice GIS basics.
- GIS aids urban planning and catastrophe response decision-making.

Target Audience:

- Students and researchers in geography, urban planning, environmental science, agriculture, and geology
- Professionals in government and private sectors related to planning, transport, or infrastructure
- NGO staff and development practitioners
- Environmental and disaster management workers
- Beginners looking to explore a career in GIS or spatial analysis

Time Duration: **8-10 hours**

Course Title: Basics of Geographical Information System (GIS)

Module 1: Introduction to GIS & Real-life Applications

- Definition of GIS
- Importance and purpose of GIS
- Real-life applications of GIS:
    - Environmental Management
    - Urban Planning
    - Transportation
    - Disaster Management
    - Agriculture

Module 2: Elements & Components of GIS

- Key elements of GIS:
    - Data Acquisition
    - Data Management
    - Data Analysis
    - Data Visualization
    - Data Exploration
- Components of GIS:
    - Software
    - Hardware
    - People
    - Data (Spatial & Attribute)

Module 3: GIS Data Types & Tools

- Types of spatial data:
    - Vector data model (points, lines, polygons)
    - Raster data model (grid-based)
- Application of GIS:
    - View Imagery
    - Create 3D model
    - Create Map
    - Conduct Analysis
    - Overview of commonly used GIS software:
    - Commercial & Open-source options (ArcGIS, QGIS, etc.)

Module 4: Practical Demonstration Using QGIS

- Installing and launching QGIS
- Interface overview (map canvas, toolbars, status bar, etc.)
- Key functions (file handling, digitizing, navigation, GRASS plugin, etc.)