€TRAINING

Applications of Geographic Information Systems (GIS) in Transportation System Engineering and Planning

14 - 18 July 2024
Cairo (Egypt)

Applications of Geographic Information Systems (GIS) in Transportation System Engineering and Planning

REF: L1929 DATE: 14 - 18 July 2024 Venue: Cairo (Egypt) - Fee: 4095 Euro

Introduction:

The training course Geographic Information System GIS Applications in Transportation Systems Engineering / Planning is designed to provide a thorough understanding of the fundamentals of Geographic Information System GIS and introduce data collection methods and techniques using Geographic Information System for use in transportation infrastructure and road safety analysis.

Geographic information systems are now actively used by authorities in many developed countries for managing highways and transportation, primarily due to the advantages of decreased costs and improved planning, monitoring, and management of complex systems involved in transportation planning and management, accident analysis, and route planning.

The Geographic Information Infrastructure tools and approaches considerably assist in finding the most strategic investments for maintaining the transportation system in any country at peak performance, optimizing operations, and deciding capacity expansions. The goal of this course is to foster critical spatial thinking and spatial decision-making abilities while also covering the technical components of using a geographic information system .

Course Objectives:

At the end of this course the participants will be able to:

- Know the benefits of using Geographic Information Systems GIS for transportation research.
- Recognize patterns in traffic management and safety metrics that will improve the safety of transportation
- Find the underlying causes of road accidents and devise workable solutions
- Analyze the effectiveness of the following: segments, corridors, networks, or regions
- Using density estimates and heat mapping, identify hot and cold locations
- Perform the intricate spatial analysis needed to create the future transportation networks
- Create interactive, rich mapping apps.
- Develop analytical spatial thinking abilities and decision-making assurance.

Targeted Audience:

- Engineers and professionals in traffic and transportation
- Urban planning and development experts
- Project managers in the consulting industry for infrastructure solutions, as well as technicians in traffic management centers
- consultants and researchers
- engineers that specialize in traffic and transportation
- Traffic Safety Specialists
- Roadway and highway designers

Course Outlines:

Unit 1: Fundamentals of Geographical Information Systems

- Applications of Geographic Information Systems in General

- Applications of Geographic Information Systems in Transportation Studies
- The principal purposes of a geographic information system
- Connecting Data from Different Sources
- Geographic Data and the Database
    - Data Acquisition
    - Data Integration
    - Data Structure
    - Data Modeling
- ArcMap Practice

Unit 2:Maps from the Geographic Information System GIS: An Introduction

- Data Information
    - Spatial data
    - Geographic Information System GIS Database
    - Raster vs. Vector Data
- GIS Shapefiles
    - ESRI Shapefile format
- Displaying and Navigating Geographic Information System GIS Maps
- Feature Attributes
    - Census Units
    - The Point, Line, Polygon Data

Unit 3: Data Collection

- International Positioning System
- Geographic Information System GIS Geospatial Crash Analysis using Census Data, Transportation Data, and Analytics

Unit 4: Visualization and Data Processing

- Symbolizing and Labeling Geographic Information System GIS Data
- Continuous and Categorical Data
- Classification Methods
- Normalization
- Geographic Information System GIS Data Query
    - Classification
    - Identify, Select, Find
    - Select Features by Attributes
- Joining and Relating Tables
- Spatial Joining
- Dissolving and Clipping layers

Unit 5: Geospatial Analysis and Hotspot Analysis

- Introduction to Spatial Analysis
- Buffering Features
- Overlaying Data
- Spatial Analysis Methods to Identify Hotspots
    - Fishnet-based Analysis
    - Kernel Density Estimation