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ISTE STAFF CHAPTER (TN 205)

ACADEMIC YEAR 2024-25(EVEN SEMESTER)

Staff Seminar Report

A one day seminar titled "Application of GIS in Civil Engineering" was organized by **ISTE Staff Chapter [TN 205]** on **24.04.2025** from 3.00p.m. to 3.45p.m. to the faculty members of Kings College of Engineering (Autonomous) with an objective to offer a better understanding of the application of GIS in Civil Engineering. The session was handled by the resource person Mr.M. Arun Pandiyan, Assistant Professor / Department of Civil Engineering.

Introduction to Geographic Information System

A computer-based system for the collection, storage, organization, maintenance, and analysis of spatially-referenced data, and the output of spatially-referenced information.

- ✓ Data Any collection of related facts; the basic elements of information.
- ✓ Information Data that have been processed to be useful; provides answers to "who", "what", "where", and "when" questions

Types of Data

- ✓ Spatial data
- ✓ Attribute data

Representation of Data in GIS

By grouping into layers based on similar characteristics (e.g. hydrography, elevation, water lines, sewer lines, grocery sales) and using either:

- ✓ **Vector** data model
- ✓ Raster data

Application of GIS in Civil Engineering

- ✓ Transportation
- ✓ Watershed Analysis
- ✓ Environment Impact Assessment
- ✓ Urban Development
- ✓ Risk Management
- ✓ Mineral Mapping
- ✓ Natural Hazard Assessment
- ✓ Resource Management

1. GIS IN Transportation Engineering

GIS facilitates the design and optimization of transportation systems, considering factors like traffic flow, road networks, and public transit routes.

2. Watershed Analysis

Watershed management is a term used to describe the process of implementing land use practices and water management practices to protect and improve the quality of the water and other natural resources within a watershed by managing the use of those land and water resources in a comprehensive manner.

3. Urban Planning

GIS helps in visualizing and analyzing urban development scenarios, including land use patterns, infrastructure needs, and potential environmental impacts.

4. Environmental Impact Assessment

GIS helps in assessing the potential environmental consequences of infrastructure projects, ensuring responsible development practices.

5. Infrastructure Tracking and Monitoring

GIS allows for the tracking of infrastructure assets (roads, bridges, utilities, etc.) and monitoring their condition over time.

6. Terrain Analysis

Topographic data is essential particularly for projects involving slope stability, drainage and grading and with the use of GIS tools, engineers may analyze the land's aspect, slope and elevation in detail.

7. Evacuation Planning

Estimating excavation quantity for construction in a challenging terrain surface is quite complicate. Thus, modelling the natural terrain from survey data and excavation profile from excavation plan in GIS (Geographical Information System) helps to estimate the quantity of soil to be excavated and filled with better accuracy.

8. Irrigation System Design

- Identifying suitable cultivation areas
- Estimating irrigation water requirements
- Designing irrigation systems

Totally 13 faculty members actively participated in this session and gained knowledge about the application of GIS in Civil Engineering. The seminar was arranged by **Mrs.T. Gnanajeya**, Coordinator / ISTE Chapter.



Coordinator / ISTE Chapter 28/4/25

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