

Course: Geographic Information Systems

Course Code: noc21-ce09

Session: 2020-21

Duration: 12 Weeks

Assessment procedures: Weekly Assignment (25%) + proctored certification Exam (75%)

Curriculum of the Course:

Week 1: What is Geographic Information Systems?

- Essential components of GIS
- Different types of vector data
- Concept of topology
- Demonstration through GIS software

Week 2: Raster data model and comparisons with vector

- TIN data model and comparisons with raster
- Non-spatial data (attributes) and their types
- Vector Data Compression Techniques
- Demonstration through GIS software

Week 3: Raster Data Compression Techniques-01

- Raster Data Compression Techniques-02
- Georeferencing
- Pre- processing of spatial datasets-01
- Demonstration through GIS software

Week 4: Pre-processing of spatial datasets-02

- Pre-processing of spatial datasets-03
- Spatial Interpolation Techniques-01
- Spatial Interpolation Techniques-02
- GIS Analysis- 01

Week 5: GIS Analysis-02

- GIS Analysis-03
- GIS Analysis- 04
- GIS Analysis-05
- Demonstration through GIS software

Week 6: GIS Analysis-06

- GIS Analysis-07
- Attributes Classification Methods
- Spatial Database systems and their types-01
- Demonstration through GIS software

Week 7: Spatial Database systems and their types-02

- Concept of No Data in Raster
- Different map projections

Concept of digital elevation model (DEM) and how it is represented
Demonstration through GIS software

Week 8: Various techniques to generate digital elevation models-1
Various techniques to generate digital elevation models-2
Various techniques to generate digital elevation models-3
Digital Elevation Models and different types of resolutions
Demonstration through GIS software

Week 9: How to assess quality of a DEM
Integration of DEMs with satellite data
Common derivatives of DEMs - Slope and aspect-01
Common derivatives of DEMs - Slope and aspect-02
Demonstration through GIS software

Week 10: Common derivatives of DEMs - Slope and aspect-03
DEMs derivatives-1
DEMs derivatives-2
DEMs derivatives-3
DEMs derivatives-4

Week 11: Triangulated Irregular Network (TIN) and its derivatives
Shaded relief models and their applications
DEM based Surface Hydrologic Modelling-1
DEM based Surface Hydrologic Modelling-2
DEMs and Dam Simulation and its application in groundwater hydrology

Week 12: DEMs Sources, limitations and future of Digital Elevation Models
Applications of DEMs in View shed and Flood Hazard Mapping
Applications of DEMs in solar and wind energy potential estimations
Errors in GIS and key elements of maps
Limitations and Rules of GIS

List of students enrolled

S.No	Student Name
1	Aman jain
2	RAKESH CHOUDHARY
3	Kartik
4	RITIK MATHUR
5	Sourabh Kabra
6	Sunny Roy
7	Suraj Meena