

DAY 1: Geospatial Technology

Day one of the course covers the history of GIS from its theories and concepts to spatial analysis. At the end of the day learners will have an understanding of how GIS developed from paper maps to digital maps, the underlying theories and concepts of GIS, and the benefits of using open source tools.

Session Title	Schedule	Topics
About IIHS & Geospatial Lab	09:30 – 10:00	About Indian Institute for Human Settlements and Geospatial Lab of IIHS
Introduction to GIS & Remote Sensing	10:00 – 11:15	<ul style="list-style-type: none">• What is GIS?• What is remote sensing?• IS and remote sensing and its applications
Tea Break	11:15- 11:30	
Types of Geospatial Data	11:30 – 13:00	<ul style="list-style-type: none">• What is a vector?• What is a raster?• What are attributes?• How representation differs with scales
Lunch Break	13:00 – 14:00	
Coordinate System and Projections	14:00 – 16:00	<ul style="list-style-type: none">• What is a coordinate system?• What are map projections?• What is transformation?• Common projections used For Indian cities
Tea Break	16:00 – 16:15	
Getting Started with QGIS	16:00 – 17:45	<ul style="list-style-type: none">• Getting accustomed with the interface (Map frame, Composer, Map Layer, Browser)• Adding raster and vector layers• Adding plugins (Open Layer, Qgis2threejs)
Learning of the day	17:45 – 18:00	Discussion and queries

DAY 2: Data Collection and Analysis

Day two of the course covers the importance of different types of data models used in GIS. By the end of the session, learners will be able to create, edit and combine information from various sources and can derive entirely new sets of information by applying a large, rich and sophisticated set of spatial operators.

Session Title	Schedule	Topics
Review of Day 1	09:30 – 09:45	
Creating GIS Data	09:45 – 10:45	<ul style="list-style-type: none"> • What is SNS? How does SNS work and its applications • Can scanned images and photos be used as GIS Data? • What is CAD? Conversion of CAD to GIS • Representing tabular data in a map • Websites from where data (DEM, Landsat, LISS and OSM) can be downloaded
Hands-on with GPS	10:45- 11:15	<ul style="list-style-type: none"> • Data collection
Tea Break	11:15- 11:30	
Working with Basic GIS Operations	11:45 – 13:00	<ul style="list-style-type: none"> • What is georeferencing? • How to georeference scanned images, photos and aerial images • What is the process of digitisation?
Lunch Break	13:00 – 14:00	
Working with Basic GIS Operations	14:00 – 15:00	<ul style="list-style-type: none"> • Enriching data by performing join • Spatial adjustment
Intermediate GIS Operations	15:00 – 16:00	<p>Performing GIS data query using QGIS (Query Builder)</p> <ul style="list-style-type: none"> • Select by location (proximity road & building.) • Select by attribute (land value, population size, literacy rate, land use typology, building classification) • Geoprocessing Tools • Buffer • Clip • Intersect
Tea Break	16:00 – 16:15	
Intermediate GIS Operations	16:15 – 17:30	<ul style="list-style-type: none"> • Raster mosaicing and clipping
Learning of the day	17:30 – 18:00	<ul style="list-style-type: none"> • Discussion and queries

DAY 3: Map Design

Day three covers the creation and demonstration of interactive map visualisations with spatially analysed datasets like discrete data and continuous data. Learners will be exposed to the concepts of cartography, quality map design with layer styling in terms of adding text, symbols, scale, north arrow, legends, title, label, and grids etc. which are required to accurately communicate information.

Session Title	Schedule	Topics
Review of Day 2	9.30 – 10.00	
Exploring Google Earth	10.00 – 11.30	<ul style="list-style-type: none">• Fundamentals of GE• Digitising features• Importing shapefiles and raster in GE• Measuring distances and areas• Making time series maps• Sharing data
Tea Break	11:30- 11:45	
Creating Thematic Maps Using Attribute Information	11:45 – 13:00	<ul style="list-style-type: none">• Graduated (demographics);• Categorical (land use);• Size scale (road, student)• How to choose color schemes• Adding pie charts and histograms
Lunch Break	13:00 – 14:00	
Map Types	14:00 – 15:45	<ul style="list-style-type: none">• Choropleth Map• Multilayer Map• Comparison between hand drawn and GIS map• Time Series Map
Tea Break	15:45 – 16:00	
Project	16:00 – 17:30	<ul style="list-style-type: none">• Storytelling with Maps
Learning of the day	17:30 – 17:45	<ul style="list-style-type: none">• Discussion and queries
Valedictory	17:45 – 18:00	<ul style="list-style-type: none">• Certificate distribution