

DEPARTMENTAL ACTIVITY: JUNE 2024

NAME OF EVENT: 30 hr CERTIFICATE COURSE

ORGANISED BY: Department of Geography

COLLABORATOR: GEOSOLUTIONS

DATE: 20th to 27th June, 2024

DURATION: 30 hrs (10:30am – 4:30pm 6 hrs X 5 days -20th, 21st, 22nd, 26th, 27th June)

VENUE: Room 309

TOPIC : COURSE ON ADVANCED GIS & REMOTE SENSING

COORDINATOR: Mr Ayan Ghosh

NUMBER OF PARTICIPANTS: Students of Sem 4 (50)

BRIEF DESCRIPTION: The course included the concept of Remote Sensing, overview on the process of GIS, Introduction to Arc GIS and Google Earth Pro

OUTCOME: A Project work was done on the administrative district map of Bankura from Arc GIS to Google Earth. Digitization of rivers, settlements and roads on the Arc GIS maps. 3D modelling of Arsenic content in ground water and solutions to the problem with GIS mapping.

REMOTE SENSING
Concept on Remote Sensing: Definition, data (in situ / remote sensing), remote sensing process, EMR Spectrum and its properties
Concept of Resolutions: Spectral, Spatial, Temporal, Radiometric; Digital optical imaging: Digital image, sensor, detector, image acquisition, PAN, multispectral, hyper spectral , digital camera
Fundamentals of aerial photography, Vertical and Oblique, Aerial cameras, Photogrammetry; Basic concepts of scale, object height and length, object area and perimeter, grayscale tone/color of objects, Photo interpretation techniques, Stereo photogrammetry and stereovision, Parallax bar and its applications.
Photographic System: Cameras, Sensor classification: Active and Passive, along track and across track scanners, Infrared Scanners, Thermal Sensors and Microwave Sensors, orbits, swath, nadir, sensor resolutions, image referencing system, orbital calendar
Spectral Signature and its Response: of Soil, Vegetation and Water, Basics of visual interpretation of satellite images, Hyper-spectral remote sensing
GIS
Overview of GIS: Introduction to GIS, definition of GIS, Components of GIS, functions and advantages of GIS, Application Areas
Spatial data model: Dimensions of GIS data, Conceptual (field/object) and logical (raster/vector/object oriented)
Concepts on co-ordinate system: Map, scale, coordinate systems, sphere/spheroid, datum, projection, projection parameters
Process of GIS: Data sources, data capture (raster/vector/attribute), Raster and vector data processing

ARC GIS
Introduction to Arc GIS
Georeferencing (image to image, image to ground), projection Shape file Creation, editing, Advance editing,
Creation of database, concept of attribute data & spatial data, external database attachment, query : spatial query, attribute query, model building
Geodatabase design,(generation/editing), Topology
Add XY data, external data attachment, create relationship, query Thematic map, Layout generation, Annotation Geoprocessing:Buffer, Intersect, Union, Clip
Surface model and surface analysis, Virtual environment, raster algebra, zonal statistics, surface interpolation; TIN/DEM creation, slope/aspect, hillshade, viewshed, 3D model,
Spatial analysis: Suitable site finding, shortest path analysis, animation in ArcMap, Import/Export
Concept & Implementation interpolation & creation of DEM : inverse distance weighted, spline, kriging, natural neighbor , Animation inArcMap, Import/Export
Digital image processing and enhancement, Atmospheric Correction, Mosaic, Fusion, layer Stacking
Digital Image Processing (Classification):Information class, spectral class, supervised vs. unsupervised, decision rules for unsupervised classification
Hydrological analysis using Digital Elevation Model, from concept to implement: Correction & rectification of DEM, calculation of flow direction, flow accumulation, identification of stream with DEM interpretation ,stream order, basin area identification
Introduction, concept of GNSS technology, three segments of GNSS, timing and ranging, calculating location, errors, differential GNSS, applications

GOOGLE EARTH PRO
Concept of Google Earth Pro ,Download & Install
Download Satellite Image from Google Earth Pro Geo referencing Google Earth Image
Creation of Vector File
Digitization
Historical Image Identification
Import & Export Feature
Import GPS Data

← COURSE CONTENT

