

Curriculum of the Program:

Online Certificate course in Remote Sensing and GIS by Dept. of Geography & CERED

2021-22

Syllabus:

Theory	
1.	PHYSICS OF REMOTE SENSING: Definition, Concept and Principles, Orbital Characteristics of Satellite Kepler's law of Planetary motion, EMR and its Characteristics, Wavelength Regions and their significance, Interaction of EMR with earth surface features and atmosphere, Spectral signatures and visual interpretation keys.
2	EO PLATFORMS AND SENSORS : Active and Passive, classification of platforms on the basis of positionSpace borne, Air borne; Classification on the basis of Bands-Panchromatic, Multispectral, Hyper spectral; Sensor Resolution; Sensors-Optical, SAR, Thermal; Weather and Communication satellites, Resolution types.
3	VISUAL IMAGE INTERPRETATION: Elements of Visual Image Interpretation, Interpretation keys, Generation of Thematic Maps
4	DIGITAL IMAGE PROCESSING: Introduction; Filters; Detectors; Scanning techniques-Across track and along track; Thermal remote sensing-Blackbody Radiation, Thermal imaging; Pre-processing (Radiometric and Geometric correction), Image Enhancement, Image Classification (Unsupervised and Supervised) and Accuracy assessment.
5	GPS and GNSS: Satellite based positioning system, working principle of GPS, Errors in GPS, Positioning method, GPS receivers, Application of GNSS
6	GIS : Introduction, components, GIS data sources, Spatial and attribute data, GIS data formats (coverage, geodatabase, shapefile, grid, dxf, dwg, geotiff, GML), Attribute types (nominal, ordinal, interval, ratio), Spatial Data Models (Raster and Vector), Digitizing, Editing and structuring map data, Concept of Topology, spaghetti; Map overlay, spatial join, Buffering analysis.
7	APPLICATION OF REMOTE SENSING: Land cover and Land Use, Agricultural Sector, Forestry, Hydrology, Mapping, Oceans and Coastal Monitoring.

Practical	
1.	Georeferencing of raster image
2	Vector data generation
3	Digitization
4	Data attachment
5	Thematic mapping
6	Layout preparation
7	Satellite image classification
8	Remote sensing indices like NDVI, NDWI, NDBI
9	Extraction of land surface temperature
10	Preparation of contour mapping from google map
11	Preparation of DEM
12	Slope map, aspect, hillshade from DEM
13	Prediction map using ANN model

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