

*Training Programme*  
*on*  
**Remote Sensing  
and  
GIS in Digital Soil Mapping**

5<sup>th</sup> - 14<sup>th</sup> February 2025



*Organized by*

**Division of Remote Sensing Applications**

**ICAR-National Bureau of Soil Survey and Land Use Planning**

**Amravati Road, Nagpur-440 033**

<https://nbsslup.icar.gov.in>

**About the Course**

Digital Soil Mapping (DSM) entails the creation and population of spatial soil information systems by numerical models inferring the spatial and temporal variations of soil types and soil properties from soil observation and knowledge derived from related environmental variables. The digital soil map is a raster-based map composed of 2-dimensional cells (pixels) organized into a grid in which each pixel has a specific geographic location and contains soil properties data. Digital soil maps illustrate the spatial distribution of soil classes or properties and can document the uncertainty of the soil prediction. Digital soil mapping better captures observed spatial variability and reduce the need to aggregate soil types based on a set mapping scale. Globally, there is an increasing trend on the application of Remote sensing, Geographic Information System (GIS) and Global Positioning System (GPS) in digital soil mapping. These technologies have immense potential in inventory, mapping and enable us to generate digital databases for better planning, monitoring, and management of soil resources. The availability and accessibility of GIS, GPS, remotely sensed spectral data, topographic data derived from digital elevation models (DEMs), predictive or inference models, and software for data analysis have greatly advanced the science and art of soil survey. Conventional soil mapping now incorporates point observations in the field that are geo-referenced with GPS and DEMS visualized in a GIS. However, the important distinction between digital soil mapping and conventional soil mapping is that digital soil mapping utilizes quantitative inference models to generate predictions of soil classes or soil properties in a geographic database (raster). Models based on data mining, statistical analysis, and machine learning organize vast amounts of geospatial data into meaningful clusters for recognizing spatial patterns.

ICAR-National Bureau of Soil Survey and Land Use Planning, Nagpur is engaged in soil survey and preparation of soil-based thematic databases and maps at various scales through field surveys, soil analysis, cartography and mapping by adopting remote sensing, GPS and GIS. To meet the demand of capacity building in emerging digital soil mapping, the advanced training programme on '**Remote Sensing and GIS in Digital Soil Mapping**' is being organized by the Division of Remote Sensing Applications at ICAR-NBSS&LUP, Nagpur during **05<sup>th</sup> - 14<sup>th</sup>, February 2025**.



## Course Content

- Principles of remote sensing and GIS
- Open data and Software for digital soil mapping
- Principles of Digital Soil Mapping
- Digital terrain analysis
- Development of environmental covariates
- Development of soil sampling strategy
- Land resource inventory and profile studies
- Spectroscopy applications for soil studies
- Machine learning algorithms in digital soil mapping

## Target Participants

This advanced training is designed especially for the working professionals from Central / State Govt./Universities / ICAR Institutes / State Departments /Private Industry / Organizations/NGO/ students & researchers engaged in soil mapping and agriculture and environmental planning.

## Course Fee

**Registration Fee: Rs. 5,000/-** to be paid by the participants to ICAR-NBSS&LUP, Nagpur through online payment gateway [https://nbsslup.icar.gov.in/nbsslup\\_payment\\_gateway](https://nbsslup.icar.gov.in/nbsslup_payment_gateway) To and fro travel charges and boarding & lodging charges at ICAR-NBSS&LUP Scientist Home/Guest House, Bajaj Nagar, Nagpur will have to be borne by the participants as per the ICAR rules & regulations. However, refreshments during the training period will be provided by the host institute.

## Eligibility Criteria

- M.Sc./M.Tech. in Agriculture/Soil Science/Soil, Physics/Soil and Water Conservation/Agri. Engg./ Hydrology/ Civil Engg./ Env. Sci./ Agric. Statistics or equivalent
- M.Sc./M.Tech. in Remote Sensing and GIS/Geography/Geology/ Geoinformatics its equivalent with specialization in soil studies and agricultural applications
- Note: Candidates nominated by the Govt. organisations & professionals working in the field of Remote Sensing & GIS Applications in Agriculture will be given preference
- Applications submitted online in the prescribed format will be considered.

## How to Apply

- Interested candidates should fill the online application form through the given Google Form <https://forms.gle/Mj4zdmZVGcj73Xqu5>
- Selected candidates will be informed by mail.
- For any further queries write to Course Coordinator through Email.

## Travel and Accommodation

The applications invited from the interested participants for the training programme on "Remote Sensing and GIS in Digital Soil Mapping" from the organizations of ICAR, SAU's KVKs who desire to participate in the training programme, their TA/DA, lodging and boarding may be borne by their respective organization/institute. However, training materials and refreshments will be arranged by the host institute. Facilities for boarding and lording will be made available for the participants at ICAR-NBSS&LUP, Scientist Home on their own cost.

## Important Dates

- **Last date for receipt of application : 10<sup>th</sup> January 2025**
- **Confirmation of participation : 15<sup>th</sup> January 2025**

## Address for Correspondence

### Course Coordinator

**Dr. Nirmal Kumar**, Senior Scientist

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### Course Director

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### Patron

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