Winter School in Geospatial Science And Technology
(Level 1: Standard Program)

13 November – 03 December- 2024

Organized by

Department of Geology,
Central University of South Bihar , Gaya, Bihar, India

सत्यमेव जयते
Department of Science & Technology
Govt. of India

Supported by

National Geospatial Program,
Department of Science & Technology,
Government of India, New Delhi

Principal Investigator

Prof. Prafull Kumar Singh,
Prof. & Head,
Department of Geology,
Central University of South Bihar Gaya (Bihar) India

Summer/Winter School Capacity Building Program in Geospatial Science and Technology

Recently knowledge has been identified as the most important driving factor for India's sustainable economic growth. India has adopted a new information regime for sustainable economic growth through its 'Digital India' program to support good governance, sustainable development goals and empowerment of its citizens. Over the last three decades, the widespread adoption of geospatial technologies into various sectors have proven to be an effective enabler to meet these challenges. The capacity building program initiatives of the National Geospatial Program (NGP) erstwhile Natural Resource Data Management System (NRDMS) Department of Science and Technology, Government of India to develop national capacity for geospatial science and technology development through diverse programs in collaboration with various partner organizations. The three week program is being conducted at three levels, Level 1 (Standard), Level 1 (Spatial thinking) and Level 2. In addition there is a three day Geo Innovation Challenge Program. The objective of the program is to build knowledge and various levels of governance in collaboration with academia and user agencies and foster innovation.

Level 1 Summer / Winter School In Geospatial Science and Technology

The 21-day summer/winter school in Geospatial Science and Technology (Level 1) supported by the National Geospatial Program (NGP) of the Department of Science and Technology, Government of India focuses on developing knowledge and capacity building in geospatial technologies through the use of open source geospatial software. It uses a standardized curriculum focusing on basics of GIS, remote sensing, digital image processing and includes hands on lab sessions, field work and a mini project.

About the National Geospatial Program of the Department of Science and Technology, Government of India

In the heart of India's technological advancement lies the National Geospatial Programme (NGP) of the Department of Science and Technology, Government of India. The Geospatial Capacity Building Program initiated in 2010 has over the years flourished, fostering capacities in geospatial science, technology, solutions, and entrepreneurship. Its transformative journey initiated with a modest ambition has evolved into a robust program, igniting minds and expanding horizons.

For a decade, the Geospatial Capacity Building Program under DST has been a cornerstone, conducting 166 comprehensive three-week programs conducted as Summer and Winter Schools in Geospatial Technologies at a basic (Level 1) and advanced level (Level 2). The 2024 cycle includes a 11 three week Level 1-(Standard) programs, 4 three week Level 1-(Spatial Thinking) programs, 8 Level 2-(Advanced) three week programs and 7 Geo Innovation Challenge Programs being conducted by various Universities across India selected through a stringent process by the DST.

The sessions at these programs comprise classroom, lab, fieldwork, and mini-projects. Central to this success is a structured curriculum and the advocacy of open-source software. The dedicated portal, https://dst-iget.in, is a reservoir of learning materials, connecting educators, professionals, and scientists, and catalyzing India's geospatial domain. The NGP-DST's geospatial capacity building program is coordinated nationally by the Bharati Vidyapeeth Deemed University, Department of Geoinformatics, Institute of Environment Education and Research, Pune.

The Central University of South Bihar (CUSB), Gaya, Bihar, India is one of the selected institutions for conducting the Level 1 Program.

Central University of South Bihar (CUSB)

The Central University of South Bihar (CUSB),NAAC A++ Grade (A Central University Established by Act of Parliament) is one of the research intensive institutions was established by Central Universities Act 2009 (Section 25 of 2009) in a permanent campus on a 300-acre of land at Panchanpur, situated about 15 km away from Gaya town to achieve the target of academic excellence in Higher Education with the aid of 'Collective Reasoning & Wisdom'.

At present, the University offers 04 UG, 25 PG, 25 Ph.D. and 01 PG Diploma programmes across several disciplines in its various Departments and Schools. In the light of National Educational Policy 2020, it further aspires to become Multidisciplinary Education and Research University (MERU) to fulfil the need and aspirations of society and nation as well as the target of SDGs Goals.

Department of Geology

The Department of Geology, Central University of South Bihar Gaya is located in the geologically important terrain of Pre-Cambrian formations to Recent Quaternary deposits. The department of Geology established in 2020 under the School of Earth, Environment and Biological Sciences .Presently Department of Geology offers M.Sc. and Ph.D. Programs in Geology. The fundamental objective of the department to build a young minds in the field of geology by providing a broad education in all aspects of the geoscience and equip the students with appropriate knowledge and skills to make them employable and capable to serve the Nation. Department has major thrust areas in Water Resources, Geohazards, River Science, Remote Sensing & GIS, Igneous Petrology, Sedimentology, Geochemistry, Geochronology, Palaeontology, Stratigraphy, Geomorphology, Quaternary Geology.

Central University of South Bihar, Gaya, Bihar, India

Who can apply?

- Faculty of colleges and universities, state and central government officials,
- Personnel from research institutions
- School teachers
- Research Scholars* (max 3 persons),
- NGOs registered with the DARPAN portal* (max 3 persons).

How to apply?

- Interested candidates should fill the online application form through the web link available on http://dst-iget.in. Kindly keep a digital copy of your photograph, LinkedIn Id / ORCID Id / Researchgate Id / Google Scholar Id (atleast one is needed) and deputation letter (format available on http://dst-iget.in website) handy while filling in the form.
- Selected candidates will be informed by mail.
- For any further queries after application write to dst.get@bharatividyapeeth.edu or call on +91- 7559288803
- Address all queries regarding the program **once selected** to the *PI, Dr.Prafull Kumar Singh at prafullsingh@cusb.ac.in , 9958196406*

Important Information

Last date for application: 30 September 2024

Date of intimation of selection: 3 October 2024
Dates of the program: 13 November – 03 December- 2024

Mode of conduct: Offline
No. of seats: 25
Registration Fees: Nil

Principal Investigator: Dr.Prafull Kumar Singh, Prof. & Head
Department of Geology, Central University of South Bihar Gaya (Bihar) India
Email: prafullsingh@cusb.ac.in
Phone: 9958196406

For any queries contact

Dr.Prafull Kumar Singh (PI) , prafullsingh@cusb.ac.in, 9958196406

Address

Department of Geology ,
Central University of South Bihar Gaya (Bihar), NH-120, Gaya- Panchanpur Road, Post-Fatehpur, Gaya, 824236, Bihar, India

Grading and Certification

Certificate of participation will be awarded to each participant only after attending the full course.

Travel and Lodging

Each participant will be reimbursed with 3 AC train fare. Lodging and boarding on a double sharing basis will be provided by the host institution.

Infrastructure Facilities

Laboratory

Department of Geology have good infrastructure and lab facility, specially Remote Sensing and Groundwater Modeling Lab equip with software's for image processing and GIS work. The department also have central computer lab facility with good number of computer and Smart class rooms with all Audio, Video Teaching resources. Department have good number of open source software along with Arc GIS , ERDAS Imagine and Geomedia Software's, Digital Total station and other Surveying devices.

Lodging and Boarding

CUSB Gaya has well-furnished guest house for the resource persons and participants. Participants will be given twin sharing based rooms and Conference facility at University Guest House. Further details about the guest house facility can be found at https://www.cusb.ac.in/guest-house/

Remote Sensing & GIS and Groundwater Modelling Lab

Classroom

Guest House

Guest House Room

Deputation Letter (Format) for DST Summer/Winter School/ Geoinnovation Program 2024-25

This is to state that Dr./Mr./Ms. _____working at _____(name of the institute) as _____ (Designation), since _____ (year) is being deputed/nominated to_____(program name in detail) from ----------(date, month, year) to---------- (date, month, year) . He/she will be relieved from his/her duties during this period.

Signature and Seal

Head of the Institute

Program Schedule for 21 Days Summer School in Geospatial Science and Technology

(Level 1: Standard)

Conducted by: Central University of South Bihar Gaya, Bihar, India

Proposed Date: 13 November – 03 December, 2024

Date & Day	Time	Topic	Instructor
13/11/2024 (Day-1)	09:30 -11:00 AM	Registration; Inauguration and brief about the training programme; Interaction with the participants/trainees and trainers.	CUSB Team
	11:00 - 11:30 AM	Hi Tea	
	11:30 -01:00 PM	Introduction to Geospatial technology and its importance in current prospective.	Keynote Speaker
	01:00 -02:00 PM	Lunch	
	02:00 -05:30 PM	Acquisition of Satellite Images and downloading of satellite Images, Exploring Bhuvan data, Downloading SOI data. Hands-on exercise	Prof. Prafull Singh (CUSB, Gaya)
14/11/2024 (Day2)	09:30 -11:00 AM	Feedback session; Brief about the maps, scale, symbols etc. Introduction about toposheets and their nomenclature.	Dr. Dhirendra Kumar (CUSB, Gaya)
	11:00 -11:30 AM	Hi Tea	
	11:30 -01:00 PM	Basics of Remote Sensing Technology and its Applications	Prof. Prafull Singh , (CUSB, Gaya)
	01:00 -02:00 PM	Lunch	
	02:00 -05:30 PM	Importance of Map Projection, Scale (Georeferencing, datum, and Projections), Overview of QGIS to define projection and Hands-on exercise	CUSB Team
Day-3 15/11/2024 (Friday)	09:30 -11:00 AM	Feedback session; Satellite Image Interpretation	Prof. Prafull Singh (CUSB, Gaya)
	11:00 -11:30 AM	Hi Tea	
	11:30 -01:00 PM	Introduction to database and database management systems (DBMS)	IIRS/ISRO
	01:00 -02:00 PM	Lunch	
	02:00 -05:30 PM	Hands-on exercise for visualization of images, its projections and distance calculation using QGIS. Geo-referencing of SOI toposheet using QGIS	CUSB Team
Day-4 16/11/2024 (Saturday)	09:30 -11:00 AM	Feedback session; Elements of a Map, Cartographic evolution, Map creation.	IIRS/ISRO
	11:00 -11:30 AM	Hi Tea	
	11:30 AM-01:00 AM	Understanding data quality, Elements of data quality, errors in geospatial data building and Importance of metadata.	IIRS/ISRO
	01:00 PM-02:00 PM	Lunch	
	02:00 PM-05:30 PM	Hands-on : Exercise related to band combination/layer stacking); Digitisation and map preparation	CUSB Team
Day-5 17/11/2024 (Sunday)	Holiday/ Self work		

Date & Day	Time	Topic	Instructor
Day-6 18/11/2024 (Monday)	09:30 AM-11:00 AM	Feedback session; Understanding attribute data, Database creation/development, importance of databases in GIS	IIRS/ISRO
	11:00 AM-11:30 AM	Hi Tea	
	11:30 AM-01:00 PM	Mini Project discussion; Formation of Groups and assigned project works for each group	Prof. Prafull Singh & CUSB Team
	01:00 PM-02:00 PM	Lunch	
	02:00 PM-05:30 PM	Hands-on: Working with Spatial and Non-Spatial Attribute data	CUSB , Team
Day-7 19/11/2024 (Tuesday)	09:30 AM-11:00 AM	Feedback session; Introduction to Global Positioning System (GPS)	Dr. Dhirendra Kumar , CUSB, Gaya
	11:00 AM-11:30 AM	Hi Tea	
	11:30 AM-01:00 PM	Applications on RS/GIS in Watershed Development and Management	Prof. Prafull Singh (CUSB , Gaya)
	01:00 PM-02:00 PM	Lunch	
	02:00 PM-05:30 PM	Hands-on: Field exercise for collecting points using a handheld GPS and importing location data into QGIS .	CUSB team
Day-8 20/11/2024 (Wednesday)	09:30 AM-11:00 AM	Feedback session; Applications of RS and GIS in Glacial Studies with case study	Dr. Dhirendra Kumar , (CUSB, Gaya)
	11:00 AM-11:30 AM	Hi Tea	
	11:30 AM-01:00 PM	Applications of RS and GIS in Groundwater Resources Assessment and Management.	Prof. Prafull Singh , (CUSB , Gaya)
	01:00 PM-02:00 PM	Lunch	
	02:00 PM-05:30 PM	Hands-on: Watershed Delineation and Catchment area analysis	CUSB Team
Day-9 21/11/2024 (Thursday)	09:30 AM-11:00 AM	Feedback session; Introduction to Image Classification and Image Enhancements	ICFRE, Dehradun
	11:00 AM-11:30 AM	Hi Tea	
	11:30 AM-01:00 PM	Contrast Enhancements, Band rationing, Spatial filtering, Principal Components Analysis, Vegetation Indices , Principal Component analysis	ICFRE, Dehradun
	01:00 PM-02:00 PM	Lunch	
	02:00 PM-05:30 PM	Hands-on: Working with images Sub-setting and mosaicking, image enhancements	CUSB Team
Day-10 22/11/2024 (Friday)	09:30 AM-11:00 AM	Feedback session; Introduction to Image Classification:Unsupervised	ICFRE, Dehradun
	11:00 AM-11:30 AM	Hi Tea	
	11:30 AM-01:00 PM	Introduction to Image Classification: Supervised	ICFRE, Dehradun
	01:00 PM-02:00 PM	Lunch	
	02:00 PM-05:30 PM	Hands-on: Exercise related to Image Classification: Unsupervised	CUSB Team
Day-11 23/11/2024 (Saturday)	09:30 AM-11:00 AM	Feedback session; Accuracy assessment of classified data	ICFRE, Dehradun
	11:00 AM-11:30 AM	Hi Tea	
	11:30 AM-01:00 PM	Case study-: Land use / land cover and Change mapping	CUSB Team

Date & Day	Time	Topic	Instructor
	01:00 PM-02:00 PM	Lunch	
	02:00 PM-05:30 PM	Hands-on: Exercise related to Image Classification: Supervised	CUSB Team
Day-12 24/11/2024 (Sunday)	Holiday/ Self work		
Day-13 25/11/2024 (Monday)	09:30 AM-11:00 AM	Feedback session; Introduction to Change Detection	Prof. Prafull Singh (CUSB , Gaya)
	11:00 AM-11:30 AM	Hi Tea	
	11:30 AM-01:00 PM	Understanding Terrain Data , DEM and applications.	IIT, Patna
	01:00 PM-02:00 PM	Lunch	
	02:00 PM-05:30 PM	Hands-on: Exercise on DEM for terrain analysis	IIT, Patna
Day-14 26/11/2024 (Tuesday)	09:30 AM-11:00 AM	Feedback session; Introduction to Total Station and their applications	Dr. Dhirendra Kumar , CUSB , Gaya
	11:00 AM-11:30 AM	Hi Tea	
	11:30 AM-01:00 PM	Demonstration of Total Station and field data collection	CUSB Team , Gaya
	01:00 PM-02:00 PM	Lunch	
	02:00 PM-05:30 PM	Collection of field data using Total Station in CUSB Campus, Gaya	CUSB Team , Gaya
Day-15 27/11/2024 (Wednesday)	09:30 AM-11:00 AM	Feedback session; Application of Remote Sensing and GIS to manage and mitigate the disasters at current scenario	Prof. Prafull Singh , CUSB , Gaya
	11:00 AM-11:30 AM	Hi Tea	
	11:30 AM-01:00 PM	Applications of Geospatial Technology in Climate Studies	Banaras Hindu University (BHU)
	01:00 PM-02:00 PM	Lunch	
	02:00 PM-05:30 PM	Hands-on: Change detection Analysis	CUSB , Team
Day-16 28/11/2024 (Thursday)	09:30 AM-11:00 AM	Feedback session; Remote Sensing and GIS applications in Groundwater quality Assessment	IIT(ISM), Dhanbad
	11:00 AM-11:30 AM	Hi Tea	
	11:30 AM-01:00 PM	Applications of Geospatial Technology in Natural Resource Management with case study	IIT(ISM), Dhanbad
	01:00 PM-02:00 PM	Lunch	
	02:00 PM-05:30 PM	Hands-on: Group exercise: Participants to make a methodology flow chart for given applications	CUSB Team
Day-17 29/11/2024 (Friday)	09:30 AM-05:30 PM	Mini Project Work (CUSB Team)	
Day-18 30/11/2024 (Saturday	09:30 AM-05:30 PM	Mini Project Work (CUSB Team)	
Day-19 01/12/2024 (Sunday)	Holiday/ Self work/Project Work		

Date & Day	Time	Topic	Instructor
Day-20 02/12/2024 (Monday)	09:30 AM-05:30 PM	Mini Project Work (CUSB Team)	
Day-21 03/12/2024 (Tuesday)	Morning session 09:30 AM-01:00 PM	Mini Project Presentation and Evaluation (Group wise)	
	01:00 PM-02:00 PM	Lunch	
	02:00 PM on wards	Mini Project Presentation and Evaluation (Group wise) Certificate Distribution and Valedictory Session	