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

27 May to 16 June 2024

Organized by

K. J. Somaiya Institute of Technology,
Somaiya Vidyavihar and
K. J. Somaiya College of Engineering,
Somaiya Vidyavihar University, Mumbai
Maharashtra, India

Supported by

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

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Principal Investigator

Dr. Shyamal S. Virnodkar, Associate Professor, Department of Computer Engineering, K. J. Somaiya Institute of Technology, Sion, Mumbai, India

Co-Principal Investigator

Dr. Jyoti Joglekar, Professor, Department of Computer Engineering
K. J. Somaiya College of Engineering, Somaiya Vidyavihar University, Mumbai, 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: Standard Program) 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 K. J. Somaiya Institute of Technology, Somaiya Vidyavihar and K. J. Somaiya College of Engineering, Somaiya Vidyavihar University, Mumbai, Maharashtra, India is one of the selected institutions for conducting the Level 1 Program.

Somaiya Vidyavihar (SVV)

The Somaiya Vidyavihar Education Trust, established by Padmabhushan Pujya Shri Karamshibhai Jethabhai Somaiya in September 1959, embodies a profound conviction in the transformative power of value- based holistic education. He recognized education as the linchpin for nurturing human resources and advancing the development of the nation. The Somaiya Vidyavihar comprises a cohesive alliance of Schools, Faculties, Departments, and Colleges, each governed by its statutes and regulations, Somaiya Vidyavihar epitomizes a harmonious educational ecosystem Renowned for its excellence in Science, Technology, Medicine, Engineering, Management, Social Sciences, and Commerce programs, the institution is equally distinguished for its academic offerings that delve into the diverse faiths and cultures of India. Visit us on: https://www.somaiya.edu/en/

Somaiya Vidyavihar University (SVU)

Established in 2019, SVU, Mumbai, is a self-financed private university recognised by the UGC. Somaiya Vidyavihar has over six decades of rich experience in building and managing educational institutes of great repute. The University has been operational since 26th August 2019, and a place where learners can explore new possibilities and pursue their passion. There are ten constituent colleges under the umbrella of SVU. Being located in the heart of Mumbai spread across a vast 50-acre sprawling green campus, and having state-of-the-art learning infrastructure, it caters to 39,000+ students in diverse fields of education, including design, engineering, library science, management, religion, culture, sports, music, humanities, and sciences. SVU offers students the flexibility to simultaneously earn degrees and certifications in multiple disciplines, offered by our constituent colleges.

K. J. Somaiya Institute of Technology (KJSIT)

K. J. Somaiya Institute of Technology (KJSIT) is one of the reputed engineering institute approved by AICTE, DTE and permanently affiliated to the University of Mumbai. It was established by the Somaiya Trust in the year 2001, at Sion campus in the heart of Mumbai city, Maharashtra, India. The institute provides quality engineering education in the modern fields of technology disciplines at UG viz. Computer Engineering, Information Technology, Electronics & Telecommunication Engineering and Artificial Intelligence & Data Science, PG in Artificial Intelligence and Ph.D in Computer Engineering, Electronics & Telecommunication Engineering and Information Technology. The institute aims to provide the necessary dynamism in the light of expanding knowledge and changing socio-economic requirements of the modern society.

K. J. Somaiya Colllege of Engineering (KJSCE)

K. J. Somaiya College of Engineering is a leading engineering college of Somaiya Vidyavihar University in Mumbai. Since its establishment in 1983, it has been deeply committed to excellence in education and affordability for all students. It strives to provide an environment to master the fundamentals, create and apply knowledge, and also encourage students to discover new solutions using multidisciplinary approach, and thus preparing them to be dynamic and multifaceted engineers who are more equipped with required life skills to face various challenges and serve the society.

K. J. Somaiya Institute of Technology, Mumbai , Maharashtra (KJSIT)

K. J. Somaiya College of Engineering (KJSCE) , Mumbai , Maharashtra

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.iget@bharatividyapeeth.edu or call on +91- 7559288803

- Address all queries regarding the program **once selected** to the PI, Dr. Shyamal Virnodkar, shyamal@somaiya.edu, 9869406401

Important Information

Last date for application: 30 April 2024
Date of intimation of selection: 3 May 2024
Dates of the program: 27 May to 16 June, 2024

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

Principal Investigator: Dr. Shyamal Virnodkar, Associate Professor, K. J. Somaiya Institute of Technology, Ayurvihar Campus, Sion, Mumbai
Email: Shyamal@somaiya.edu
Phone: +91-9869406401(M), +91-22-44444408(O)

Co-Principal Investigator: Dr Jyoti Joglekar, Professor, K. J. Somaiya College of Engineering, SVU
Email: jyoti.joglekar@somaiya.edu
Phone: 9594980587

For any queries contact

Dr. Shyamal Satish Virnodkar (PI), shyamal@somaiya.edu, 9869406401
Venue

B 107, Bhaskaracharya Building, K. J. Somaiya College of Engineering, Somaiya Vidyavihar University, Mumbai, Maharashtra, India, 400077

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

The institute is well equipped with Geospatial Technology laboratories with advanced instruments and computers with the latest configuration such as high-end workstations with all open-source remote sensing and GIS software and professional software, such as ArcGIS, more than 35 computers will be available for the participants. There is an availability of licensed geospatial software ArcGIS as well as QGIS open-source software on each workstation. Additionally uninterrupted availability of high-speed internet facility with 100 MBPS bandwidth.

Lodging and Boarding

We take pride in ensuring that participants in our programs experience the utmost convenience. Our accommodation and dining facilities are strategically situated within a 5-10 minute walk from the training spaces. This thoughtful placement allows our participants to maximize their time for learning, collaborative sharing of experiences, and valuable networking opportunities. We look forward to providing you with a comfortable and productive stay. All the participants will be provided with shared accommodation in the guest house/hostel.
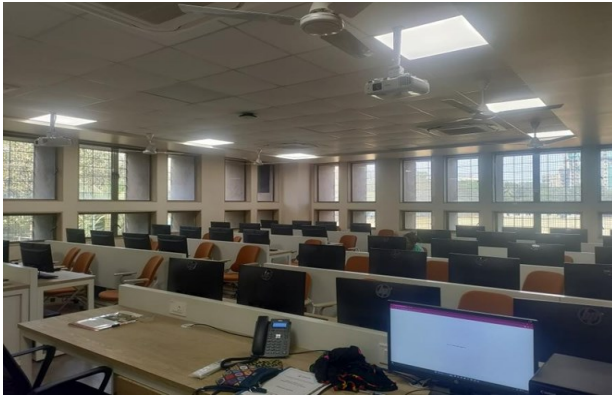
Training Room -cum- Lab

Seminar Hall

Open workspace with Wi-Fi

Hostel at KJSCE Campus

Deputation Letter (Format) for DST Summer/Winter School/ Geoinnovation Program 2024-25 (Prospective participant must submit this on the letterhead of the respective institution where they are working)

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 Program)
Conducted by: K. J. Somaiya Institute of Technology, Somaiya Vidyavihar and K. J. Somaiya College of Engineering, Somaiya Vidyavihar University, Mumbai, Maharashtra, India
27 May to 16 June 2024

Day and Date	Feedback (9:00 - 9:30)	Morning Session (09:30 - 11:00)		Morning Session (11:30 - 13:00)		Lab Session (14:.00- 16:00)		Lab Session (16:30 - 18:00)
Day-1 27/05/2024 MONDAY		Inauguration Ceremony *Chief Guest & DST Representative* Plenary talk by (Expert / Guest)	Tea Break (11:00- 11:30)	Session 1.1 Introduction of the Trainers and Trainees *Dr. Shyamal Virnodkar, KJSIT* Session 1.2: Theory Introduction to geospatial science and technology *Dr. Jyoti Joglekar, KJSCE*	Lunch Break (13:00 - 14:00)	Session 1.3: Theory Introduction to data types ingeospatial information (GI) Internal Expert *Dr. Bhakti Palkar, KJSCE*	Tea Break (16:00- 16:30)	Session 1.4: Hands-on Acquiring data (capture) Internal Expert *Dr. Bhakti Palkar*
Day-2 28/05/2024 TUESDAY	Session 2.1	Session 2.2: Theory Geographic coordinate systems and Map projections Understanding scales and projections. Internal Expert *Prof. Bharathi H. N.*		Session 2.3: Theory of Geographic coordinate systems and Map projections, Scale factor and transformation, properties of map projections, Different types of projections, georeferencing Internal Expert, *Prof. Bharathi H. N.*		Session 2.4: Hands-on Overview of QGIS Internal Expert *Prof. Jyothi Rao, KJSCE*		Session 2.5: Hands-on Working with projections using QGIS, Geo-referencing Internal Expert *Prof. Bharathi/Prof. Jyoti Rao, KJSCE*
Day-3 29/05/2024 WEDNESD AY	Session 3.1	Session 3.2: Theory Understanding data quality · Elements of data quality · Sourcesand types of errors in geospatial data building · Importance of metadata		Session 3.3: Theory Extracting data georeferencing. and extraction of data GIS Database Internal Expert *Prof. Shweta Chachra, KJSCE*		Session 3.4: Hands-on Georeferencing Internal Expert *Prof. Shweta Chachra, KJSCE*		Session 3.5: Hands-on Extracting data (vector and raster) Internal Expert *Dr. Archana Gupta KJSCE*, Minor Project work: Formationof Groups

		Internal Expert Dr. Archana Gupta, KJSCE					
Day-4 **30/05/2024** **THURSDAY**	**Session 4.1**	Session 4.2: Theory Understanding map making External Expert *Er. Sunil Kumar Jha*	Session 4.3: Theory Group exercise on analysis of good and bad maps with reasons Group work and presentation External Expert *Er. Sunil Kumar Jha*	Session 4.4: Hands-on Map Preparation External Expert *Dr. Sashikant Sahoo, PRSC*		Session 4.5: Hands-on Map Preparation External Expert *Dr. Sashikant Sahoo, PRSC*	
Day-5 **31/05/2024** **FRIDAY**	**Session 5.1**	Session 5.2: Theory Understanding Attribute Data Internal Expert *Dr. Nilkamal More, KJSCE*	Session 5.3: Theory Understanding Attribute Data Internal Expert *Prof. Suchitra Patll, KJSCE*	Session 5.4: Hands-on Data Exploration Internal Expert *Dr. Nilkamal More, KJSCE*		Session 5.5: Hands-on Working with Tables Internal Expert *Prof. Suchitra Patll, KJSCE*	
Day-6 **01/06/2024** **SATURDAY**	**Session 6.1**	Session 6.2: Theory Visualizing data through queries Internal Expert: *Mrs. Rajkamal Goundi, GBL*	**Tea Break (11:00-11:30)** / Session 6.3: Theory Visualizing data through queries Internal Expert *Mrs. Rajkamal Goundi, GBL*	**Lunch Break (13:00-14:00)** / Session 6.4: Hands-on Working with Queries Internal Expert *Mrs. Rajkamal Goundi, GBL*		**Tea Break (16:00- 16:30)** / Session 6.5: Hands-on Working with Queries Internal Expert *Mrs. Rajkamal Goundi,* GBL Minor Project work: Idea Presentation by Participants	

Day	Session		Tea Break (11:00-11:30)		Lunch Break (13:00-14:00)		Tea Break (16:00-16:30)	
Day-7 02/06/2024 SUNDAY	**Session 7.1**	Session 7.2: Theory Introduction to Global Positioning System (GPS) Internal Expert *Dr. Shyamal Virnodkar, KJSIT*		Session 7.3: Field Visit Field exercise for collecting points using GPS using a handheld GPS Internal Expert *Dr. Shyamal Virnodkar, KJSIT*		Session 7.4: Theory Change detection External Expert *Dr. Sashikant Sahoo, PRSC*		Session 7.5: Hands on Introduction to SAGA and Change Detection with SAGA External Expert . *Dr. Sashikant Sahoo, PRSC*
Day-8 03/06/2024 MONDAY	**Session 8.1**	Session 8.2: Theory Types of Remote Sensing Internal Expert *Prof. Vricha Chavan, KJSIT*		Session 8.3: Theory Applications of Remote Sensing Internal Expert *Prof. Vricha Chavan, KJSIT*		Session 8.4: Hands-on Geospatial Analysis with SAGA Internal Expert *Dr. Sonali Patil , KJSCE*		Session 8.5: Hands-on Geospatial Analysis with SAGA Internal Expert *Prof. Sujata Pathak, KJSCE*
Day-9 04/06/2024 TUESDAY	**Session 9.1**	Session 9.2: Theory Understanding the image Elements of visual interpretation Internal Expert *Dr. Nandana Prabhu, KJSCE*		Session 9.3: Theory Understanding the image understanding image statistics Internal Expert *Dr. Sonali Patil/Prof. Sujata Pathak, KJSCE*		Session 9.4: Hands-on Image Interpretation Internal Expert *Dr. Nandana Prabhu, KJSCE*		Session 9.5: Hands-on Understanding the image (histogram) Internal Expert *Dr. Sonali Patil /Prof. SujataPathak, KJSCE*
Day-10 05/06/2024 WEDNESDAY	**Session10.1**	Session 10.2: Theory and Hands-on Geometric Correction Internal Expert *Dr. Shyamal Virnodkar, Prof. Kavita Bathe, KJSIT*		Session 10.3: Theory and Hands-on Atmospheric and Radiometric Corrections Internal Expert *Dr. Shyamal Virnodkar, Prof. Kavita Bathe, KJSIT*		Session 10.4: Theory and Hands-on Image Registration Internal Expert *Dr. Shyamal Virnodkar, Prof. Kavita Bathe, KJSIT*		Session 10.5: Hands-on Importing GPS data into QGISand Using Google Earth / Bhuvan Internal Expert *Dr. Shyamal Virnodkar, KJSIT*

Day	Session		Tea Break (11:00-11:30)		Lunch Break (13:00-14:00)		Tea Break (16:00- 16:30)	
Day-11 06/06/2024 THURSDAY	**Session11.1**	Session 11.2: Theory Introduction to Image Enhancements Contrast enhancements · Bandrationing. Internal Expert *Prof. Grishma Sharma, KJSCE*		Session 11.3: Theory Introduction to image enhancements Spatial filtering Principal Components Analysis Vegetation Indices Internal Expert *Prof. Mansi kambli, KJSCE*		Session 11.4: Hands-on Working with images Subsetting and mosaicking Internal Expert *Prof. Grishma Sharma, KJSCE*		Session 11.5: Hands-on Using Enhancements Internal Expert *Prof Mansi kambli, KJSCE*
Day-12 07/06/2024 FRIDAY	**Session12.1**	Session 12.2: Theory Introduction to Image Classification: Unsupervised External Expert *Dr. Anil Kumar, IIRS*		Session 12.3: Theory Introduction to Image Classification: Supervised External Expert *Dr. Anil Kumar, IIRS*		Session 12.4: Hands-on Extracting information for satellite image using unsupervised Classification External Expert *Dr. Anil Kumar, IIRS*		Session 12.5: Hands-on Extracting information for satellite image using unsupervised classification External Expert *Dr. Anil Kumar, IIRS*
Day-13 08/06/2024 SATURDAY	**Session13.1**	Session 13.2: Theory and Hands-on Extracting information forsatellite images using supervised classification Internal Expert *Prof. Kavita Bathe, KJSIT*		Session 13.3: Theory and Hands-on Accuracy assessment: why and how Internal Expert *Prof. Kavita Bathe, KJSIT*		Session 13.4: Theory Understanding terrain data andTerrain data External Expert *Dr. Sudhir Singh, KBCAOS*		Session 13.5: Hands-on Terrain analysis External Expert *Dr. Sudhir Singh, KBCAOS*
Day-14 09/06/2024 SUNDAY	**Session14.1**	Recreation Activity		Recreation Activity		Recreation Activity		Recreation Activity

Day	Session	Session .2	Session .3	Break	Session .4	Break	Session .5
Day-15 **10/06/2024** **MONDAY**	Session15.1	Session 15.2: Theory Introduction to PostGRE /PostGIS and demos External Expert *Dr. Kamal Pandey, IIRS*	Session 15.3: Theory Understanding Geoserver Open layer, web services and demos External Expert *Dr. Kamal Pandey, IIRS*		Session 15.4: Hands-on Catalogue Services Geo network External Expert *Dr. Kamal Pandey, IIRS*		Session 15.5: Hands-on Exercise Using PostGRE / PostGIS External Expert *Dr. Kamal Pandey, IIRS*
Day-16 **11/06/2024** **TUESDAY**	Session16.1	Session 16.2: Theory Spatial Data Analysis Internal Expert *Dr. Jyoti Joglekar, KJSCE*	Session 16.3: Theory Spatial Data Analysis Internal Expert *Dr. Jyoti Joglekar,KJSCE*		Session 16.4: Hands-on Exercise on Spatial Data Analysis Internal Experts *Dr. Jyoti Joglekar, KJSCE/Prof. Mrunali Desai, KJSIT*		Session 16.5: Hands-on Exercise on Spatial Data Analysis Internal Experts *Dr. Jyoti Joglekar, KJSCE/ Prof. Mrunali Desai, KJSIT*
Day-17 **12/06/2024** **WEDNESDAY**	Session17.1	Session 17.2: Theory Applications on RS/GIS in planning (urban/rural) with specific casestudies highlighting detailed methodology. External Expert *Dr. Priya K, CIDCO*	Session 17.3: Theory Applications of RS / GIS in naturalresource management(forest, wildlife/agriculture/watershed) with specific case studies highlighting the detailed methodology External Expert *Dr. Priya K, CIDCO*	**Tea Break (11:00-11:30)** / **Lunch Break (13:00-14:00)**	Session 17.4: Hands-on Applications of RS / GIS in climate studies with specificcase studies highlighting detailed methodology External Expert *Dr. Priya K, CIDCO*	**Tea Break (16:00-16:30)**	Session 17.5: Hands-on Group exercise: Participants to make a methodology flow chart for given applications External Expert *Dr. Priya K, CIDCO*
Day-18 **13/06/2024** **THURSDAY**	Session18.1	Session 18.2: Theory Project Work Discussion of possible minorprojects to be done by the participants	Session 18.3: Project Work		Session 18.4: Project Work		Session 18.5: Project Work
Day-19 **14/06/2024** **FRIDAY**		Project Work	Project Work		Project Work		Project Work

Day-20 **15/06/2024** **SATURDAY**		Project Work		Project Work		Project Work	Project Work
Day-21 **16/06/2024** **SUNDAY**		Evaluation & Final project presentation by participants(Group wise presentations) *DST Observer & KJSIT / KJSCEEvaluators*		Evaluation & Final project presentation by participants (Group wise presentations) *DST Observer & KJSIT / KJSCE Evaluators*		Feedback & Valedictory Session Interaction and feedback with DST Observer & Valedictory *DST Representative & KJSIT / KJSCE Evaluators*	