Winter School in Geospatial Science And Technology (Level 2)

Theme: Advanced Geospatial Data Gathering and Management Techniques for Sustainable Smart City Development

4th -24th November 2024

CHENNAI INSTITUTE OF TECHNOLOGY
(Autonomous)

सत्यमेव जयते
Department of Science & Technology
Govt. of India

Organized by

Department of Civil Engineering
Chennai Institute of Technology (Autonomous),
Chennai, Tamilnadu
India

Supported by

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

Principal Investigator

Dr. P. Partheeban, Department of Civil, Engineering, Chennai Institute of Technology, Chennai, Tamilnadu.

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 2 Summer / Winter School In Geospatial Science and Technology

This three week program is a theme specific advanced training being implemented by eight institutions across the country. A one week online refresher session will be held prior to the commencement of the three week program. The 21-day summer/winter school in Geospatial Science and Technology (Level 2) 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 geospatial software.

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 Chennai Institute of Technology (Autonomous), Chennai, Tamilnadu India is one of the selected institutions for conducting the Level 2 Program.

Chennai Institute of Technology, Chennai, Tamilnadu

Chennai Institute of Technology, Chennai (CIT- Chennai) is a technically sound institution used to working closely with different organisations, including Manufacturing industries, Fabrication industries, IT industries, Electronics embedded technology industries, etc., and Reputed higher educational institutions in India and abroad. CIT- Chennai is accredited by NAAC and NBA and has SIRO recognition from DSIR and UGC 2 (f) and 12 (B) status. Chennai Institute of Technology has the following research facilities in addition to the regular academic laboratory facilities such as Industrial robotics, Industrial Automation, Additive Manufacturing & Reverse Engineering, and New Energy Technology (Solar & Wind). Further, our faculty strength includes more than 140 doctorates in different specializations of Manufacturing, Thermal Engineering, Composite Materials, Automation, New Energy such as Solar and Wind, Hydraulics and Pneumatics, E - Vehicles, ITS, Geospatial Technology, Electronics and Embedded Technology, Control Systems, Image Processing, Artificial Intelligence, Machine Learning, Deep Learning, Data Science, Solid Waste Management, Air Quality Monitoring System etc.

Department of Civil Engineering

The Department of Civil Engineering was established in the year 2010 with a vision to Excel in the emerging areas of Civil Engineering by imparting knowledge and relevant Practices and inculcating human values to transform the students into potential resources to cater to the needs of the industries and society in order to uphold the sustained design and construction process. Our mission:

- To provide strong fundamentals and technical skills through effective teaching and learning Methodologies.

- To transform lives of the students by fostering ethical values, creativity, and innovation to become Entrepreneurs and Start-ups.
- To habituate the students to focus on Sustainable resources towards the Welfare of the society.
- To provide an ambiance for research through collaborations with industry and academia.
- To inculcate learning the emergent technologies for pursuing higher studies and lifelong learning.

The department prepares over 30 graduates (UG) annually to become leaders in diverse fields such as academia, industry, and government.

Chennai Institute of Technology (Autonomous), Chennai, Tamilnadu

Who can apply?

- Faculty members, scientists, technologists, researchers from academia, national institutions of research, smart city cells, municipal corporations and other government departments are eligible to apply.
- Personnel from non government organizations (NGO)
- School Teachers
- Only 2-3 seats are reserved for research scholars. Only candidates who have a high degree of experience with geospatial technologies should apply for these advanced programs.

No basics will be covered in the Level 2 program. Candidates who have no knowledge of geospatial technologies should apply for the Level 1 program.

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.
- For any further queries write to dst.iget@bharatividyapeeth.edu or call on 7559288803
- Address all queries regarding the program **once selected** to the PI, *Dr. P. Partheeban, dean.pd@citchennai.net / civil@citchennai.net, 9841159199, +91-044-71119111*

Theme of the Level 2 program: Advanced Geospatial Data Gathering and Management Techniques for Sustainable Smart City Development

Summer School (Level 2 - Advanced) on Advanced Geospatial Data Gathering and Management Techniques for Sustainable Smart City Development focuses on developing capacity and enhancing the perspectives of the geospatial aspects of data gathering and management techniques for smart city development.

To provide a system for efficient smart city transportation planning and management, which is compatible with the level of socio-economic development and integrates engineering technology with legal, political, administrative, economic, managerial, and educational means to safeguard social stability and the sustainable development of the economy. The objectives of this training program are (1) to describe advances in geospatial technology, (2) To demonstrate the various smart city concept-related transportation planning, (3) to discuss applications of Geospatial technology for smart city transportation planning, and (4) to discuss requirements and benefits of Geospatial technology applications in smart transportation and management. The outcome of this summer/winter school may be a good resource for the faculty and researchers involved in smart city planning research. It also provides an opportunity for the researchers to present their research and get suggestions for further development of their research. This summer/winter school may help the producers/manufacturers of geospatial technology-related products (such as instruments/ devices) make their products as per the needs of the consumers.

Important Information

Last date for registration: 30 September 2024
Date of intimation of selection: 3 October 2024
Date of online orientation: 10 October 2024
Dates of the program: 04 to 24 November 2024

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

Principal Investigator: Dr. P. Partheeban, Department of Civil, Engineering, Chennai Institute of Technology, Chennai, Tamilnadu.
Email: dean.pd@citchennai.net / civil@citchennai.net
Phone Number: 9841159199, +91-044-71119111

For any queries contact

Dr. P. Partheeban, (Principal Investigator), dean.pd@citchennai.net / civil@citchennai.net, 9841159199, +91-044-71119111

Address

Department of Civil Engineering, Chennai Institute of Technology, Sarathy Nagar, Kundrathur, Chennai, Malayambakkam, Tamil Nadu 600069

Certificate

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 and Facilities

Laboratory

The department has a well-equipped computer laboratory with 40 computers, 2 handheld GPS, 1 total station, audiovisual equipment, and lecture halls.

Lodging and Boarding

The Institute has a guest house with AC/non-AC rooms and a 24x7 Wi-Fi facility across the campus. The number of the rooms are sufficient to accommodate 30 participants and resource persons at a time.

Computer lab

Solar Panels 300 kVA Installed

Surveying Lab

Cafeteria

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 2)

Conducted by: Chennai Institute of Technology (Autonomous),Chennai, Tamilnadu

Theme: Advanced Geospatial Data Gathering and Management Techniques for Sustainable Smart City Development

4th -24th November 2024

Day and Date	Time	Program Schedule
Monday 04.11.2024	08:30-10:30	Registration, Inauguration of Summer School
	10:30-11:00	Tea Break
	11:00-12:30	Brief on course and visit to various computer labs, Interaction with participants and feedback and Presentation on SDG. Basics of Geospatial Technology for Smart City
	12:30-01:30	LUNCH
	01:30-03:00	Introduction to Smart City
	03:00-03:15	Tea Break
	03:15-05:00	Hands on Training - Introduction to Geospatial Science and Data Collection Methods
Tuesday 05.11.2024	09:00-10:30	Introduction to IoT and Sensors for Geospatial Data gathering (Understanding of Arduino, Raspberry PI, ESP32, cloud Think speak
	10:30-10:45	Tea Break
	10:45 -12:30	Importance of Geodesy in data collection using Drones for smart city planning
	12:30 01:30	LUNCH
	01:30-03.00	Design and development IoT devices for Air Quality Monitoring
	03:00-03:15	Tea Break
	03.15-05.00	Design and development IoT devices for Water and Soil Quality Monitoring
Wednesday 06.11.2024	09:00-10:30	Implementation and Data collection of IoT devices
	10:30-10:45	Tea Break
	10:45 -12:30	LoRaWAN Introduction for geospatial data collection
	12:30 01:30	LUNCH
	01:30-03.00	Multiple data Source overview and Geospatial Referenced Traffic Data Collection using IoT
	03:00-03:15	Tea Break
	03.15-05.00	IoT Field Data Collection and Analysis
	09:00-10:30	Data Integration Techniques and

Thursday 07.11.2024		Future trends in Geospatial for IoT
	10:30-10:45	Tea Break
	10:45 -12:30	Introduction to Drones, History of Drone/UAS/UAVs, payload, battery life, Specs for good results
	12:30 01:30	LUNCH
	01:30-03.00	Hands on Training –IoT (Field data collection)
	03:00-03:15	Tea Break
	03.15-05.00	Hands on Training –IoT data analysis
Friday 08.11.2024	09:00-10:30	Regulations of DGCA and Drone license, Pre and Post Flight planning
	10:30-10:45	Tea Break
	10:45 -12:30	Flight execution and photography, data collection- Image Format, GSD, Scale and Resolution
	12:30 01:30	LUNCH
	01:30-03.00	Hands on Training –IoT (Field data collection)
	03:00-03:15	Tea Break
	03.15-05.00	Hands on Training –IoT data analysis
Saturday 09.11.2024	09:00-10:30	Hardware selections, comparison on surveying drone and its accuracy, controlling errors
	10:30-10:45	Tea Break
	10:45 -12:30	Application of Drones for Smart City data collection
	12:30 01:30	LUNCH
	01:30-03.00	Drones Lab visit and ongoing projects
	03.15-05.00	
Sunday 10.11.2024	Field Visit	
Monday 11.11.2024	09:00-10:30	Drone –based mapping and 3D Modeeling
	10:30-10:45	Tea Break
	10:45 -12:30	Data Collection and analysis using drones and exporting to GIS
	12:30 01:30	LUNCH
	01:30-03.00	Hands on Training -Drone surveying and Mapping
	03:00-03:15	Tea break
	03.15-05.00	Hands on Training – Drone surveying and Mapping
Tuesday 12.11.2024	09:00-10:30	Autonomous flight vs. manual and hybrid flight profiles
	10:30-10:45	Tea break
	10:45 -12:30	Application of drone for Construction project management, Engineering Land Survey and Transportation
	12:30 01:30	LUNCH
	01:30-03.00	Hands on Training – Drone Surveying with Land surveying
	03:00-03:15	Tea break
	03.15-05.00	Hands on Training – Drone Surveying for Construction Project Management

Wednesday 13.11.2024	09:00-10:30	Pix 4D Image Processing for drone data
	10:30-10:45	Tea Break
	10:45 -12:30	Integration of QGIS and Drone data for smart city planning
	12:30 01:30	LUNCH
	01:30-03.00	Hands on Training – IoT and Drone based smart city data collection and analysis
	03:00-03:15	Tea Break
	03.15-05.00	Hands on Training – IoT and Drone based smart city data collection and analysis
Thursday 14.11.2024	09:00-10:30	IoT and Drone based data gathering for smart city
	10:30-10:45	Tea Break
	10:45 -12:30	IoT – enabled smart logistics and supply chain management with security of data collection
	12:30 01:30	LUNCH
	01:30-03.00	Hands on Training – Python coding for geospatial data analysis
	03:00-03:15	Tea Break
	03.15-05.00	Hands on Training – Python coding for geospatial data analysis
Friday 15.11.2024	09:00-10:30	Introduction to data science for geospatial data analysis
	10:30-10:45	Tea Break
	10:45 -12:30	Geospatial data processing, training and modelling
	12:30 01:30	LUNCH
	01:30-03.00	Hands on Training - Open drone mapping
	03:00-03:15	Tea Break
	03.15-05.00	Hands on Training - Open drone mapping
Saturday 16.11.2024	08:30-05:00	Chennai Smart City Projects Field Visit
Sunday 17.11.2024		Tour /Holiday
Monday 18.11.2024	09:00-10:30	Smart City Planning - Cloud based information system
	10:30-10:45	Tea break
	10:45 -12:30	Innovative solution for Last –Mile Delivery and applications
	12:30 01:30	LUNCH
	01:30-03:00	Hands on Training – Data Science Applications on air quality monitoring with GIS
	03:00-03:15	Tea Break
	03:15-05.00	Hands on Training – Data Science Applications on air quality monitoring with GIS
Tuesday 19.11.2024	09:00-10:30	Spatial Machine learning to analyze in clustering and prediction models
	10:30-10:45	Tea Break
	10:45 -12:30	Disaster Geospatial data gathering and analysis using IoT and Drones
	12:30 01:30	LUNCH

	01:30-03.00	Hands on Training – Data Science Applications on water quality monitoring with GIS
	03:00-03:15	Tea Break
	03.15-05.00	Hands on Training – Data Science Applications on water quality monitoring with GIS
Wednesday 20.11.2024	09:00-10:30	Building Efficient Smart City network with IoT systems
	10:30-10:45	Tea Break
	10:45 -12:30	Road Accident Analysis and Road Safetyusing Geospatial technology
	12:30 01:30	LUNCH
	01:30-03.00	Hands-on training with Integrated GIS, GPS, IoT, Drone data and Data science applications
	03:00-03:15	Tea Break
	03.15-05.00	Hands-on training with Integrated GIS, GPS, IoT, Drone data and Data science applications
Thursday 21.11.2024	09:00-10:30	Geospatial technology-based case studies on Smart Cities
	10:30-10:45	Tea Break
	10:45 -12:30	Applications of Land price prediction using machine/Deep Learning
	12:30 01:30	LUNCH
	01:30-03.00	Hands-on training through project work
	03:00-03:15	Tea Break
	03.15-05.00	Hands-on training through project work
Friday 22.11.2024	09:00-10:30	Water and Waste water data collection and Analysis using IoT and ML
	10:30-10:45	Tea Break
	10:45 -12:30	Spatio-Temporal Modelling and Analysis: Developments, Challenges, and Prospects for Smart Citywith AI application
	12:30 01:30	LUNCH
	01:30-03.00	Hands-on training through project work
	03:00-03:15	Tea Break
	03.15-05.00	Hands-on training through project work
Saturday 23.11.2024	09:00-10:30	Drone Data Prediction models for smart city
	10:30-10:45	Tea Break
	11:00 -12:30	Project work presentation by participants
	12:30 01:30	LUNCH
	01:30-03.00	Project work presentation by participants
	03:00-03:15	Tea Break
	03.15-05.00	Evaluation of Training Programme – Test
Sunday		Valedictory function

24.11.2024		