

Summer School in Geospatial Technologies (Level 1)

3-23 July, 2019

**Dept of Geography
Gauhati University, Guwahati.**



Organised by

Dept of Geography
Gauhati University, Guwahati-781014



Department of Science and Technology
Ministry of Science and Technology
Government of India

Supported by

National Resources Data Management System
Department of Science and Technology,
Government of India, New Delhi

Gauhati University, Guwahati

Gauhati University is the oldest and one of the most renowned universities in North East India. It was established in 1948. It is a teaching-&-affiliating university accredited with grade "A" by National Assessment and Accreditation Council. Starting with 18 affiliated colleges and 8 Post Graduate Departments in 1948, Gauhati University, today, has 39 Post Graduate Departments, besides IDOL (Institute of Distance and Open Learning), a constituent Law and Engineering College. It has 341 affiliated colleges offering undergraduate and post graduate courses in the faculties of Arts, Science, Commerce, Law, and Engineering. Gauhati University is a member of the Association of Indian Universities and the Association of Commonwealth Universities. The aspirations of the founders of the University have not gone in vain. The alumni of this university have been able to make their mark not only within the state but at the national level as well. Indeed many have been able to adorn the higher echelons of the nation's scientific, socio-cultural, administrative and political life.

Department of Geography

Established in 1948, the Department of Geography, Gauhati University is one of the oldest geography departments of the country. From a modest beginning the department has flourished to reach its present status because of the untiring efforts of the faculty members and the great potentiality possessed by this part of the country for geography education and research. India's north east, the initial hinterland of the department, continued to be a terra incognita even after the country's independence. This naturally posed before the department an intellectual challenge to unravel the marvels of the region's nature and culture. Directed thus by the prevalent situation, curiosity and compulsion, the then faculties of the department decided to set a goal, rather a mission, towards understanding the geographical fabric of the region. Today, as we live in an increasingly interdependent world caught up in a global chain of events, the department redefines its mission to put it under the umbrella phrase- -Understanding Geography of the North-East in a New Global Order-- besides upholding the general academic standard of the discipline.

The Department is actively involved in teaching, research and extension activities. It is engaged in providing regular courses in M.A./M.Sc., M.Phil. and Ph.D. The University Grants Commission has supported the Department of Geography under Special Assistance Programme (SAP) at DRS- III level for five years (2013-2018) with two thrust areas:

1. Environmental Resources and Sustainable Development in N.E. India
2. Population and Development in N.E. India

The teaching and research programmes of the Department have been reoriented as per the thrust areas identified under SAP. With a spirit of knowledge and information sharing, the Department has initiated inter-university collaborative work in the field of Climate Change and associated issues with Kagawa University, Japan.

About the Summer School in Geospatial Tech- nologies (Level 1)

Summer School (Level 1) focuses on developing knowledge and capacity building in geospatial technologies through use of open source geospatial software.

Dates: 03-23 July, 2019

Venue: Department of Geography, Gauhati University

Principal Investigator : Dr . Anup Saikia, Professor, Gauhati University

Co-Investigator: Dr. Manash J. Nath Assistant Professor, Gauhati University

Address:

Department Of Geography
Gauhati University
Jalukbari – 781014,Guwahati, Assam

Phone: +91-361-2570372

Email:

asaikia@gauhati.ac.in
manashjnath@gauhati.ac.in

Phone: 09864093574 / 09706023126

Website:

<https://www.gauhati.ac.in/science/geography>

**Summer School in Geospatial Technologies, Gauhati University,
Guwahati**

3-23 July, 2019

Day -1 Date : 03/07/2019 Wednesday		
Time	Topic	Resource Person
09:00-10:00	Registration	
10:00-10:30	Inauguration of the Summer School Plenary Lecture: Geospatial technologies in relation to north east India	Dr. K K Sarma Sr. Scientist, NESAC, Barapani
10:30-11:30	1.1 Introduction of the group (trainers and trainees) Expectations from the training program (Get expectations from the audience) Making groups for reporting, grading of the course	Dr A.Saikia Geography Dept., Gauhati University
11:30-12:00	Tea Break	
12:00-13:00	1.2 Geospatial Sciences: What, why and how?? Moving from data to information	Dr. A.K.Bora Geography Dept., Gauhati University
13:00-14:00	Lunch Break	
14:00-15:30	1.3 Introduction to data types in geospatial information (GI): Overview of spatial and non-spatial data types (aerial photos, remote sensing, toposheets, databases, etc.)	Dr. A.K.Bora Geography Dept., Gauhati University
15:30-16:00	Tea Break	
16:00-17:30	1.4 Exercise 1: Acquiring data (capture) (Downloading of ASTER, MODIS, Bhuvan, acquiring toposheets from SOI, ordering of IRS data, acquiring secondary data)	Dr. D. Sahariah Geography Dept., Gauhati University
17:30-17:45	1.5 Filling in feedback forms	

Day- 2 Date: 04/07/2019 Thursday		
09:00-09:30	2.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative) – led by Coordinator	
09:30-11:00	2.2 Understanding scales and projections a. Scales b. Projections	Dr. B. K. Kar Geography Dept., Gauhati University
11:00- 11:30	Tea Break	
11:30- 13:00	2.3 Ex. Overview of QGIS (Use IGET_GIS_001) & Installation	Dr. D. Sahariah Geography Dept., Gauhati University
13:00-14:00	Lunch Break	
14:00-15:30	2.4 Ex. Working with projections using QGIS (use IGET_GIS_002) <ul style="list-style-type: none"> • Using existing projection • Making a new projection • Importing a projection 	Dr. M.J. Nath Geography Dept., Gauhati University
15:30-16:00	Tea Break	
16:00-17:30	2.4 Ex. Working with projections using QGIS (use IGET_GIS_002) <ul style="list-style-type: none"> • Using existing projection • Making a new projection • Importing a projection 	Dr. M.J. Nath Geography Dept., Gauhati University
17:30-17:45	2.5 Fill in feedback forms	

Day- 3 Date: 05/07/2019 Friday

09:00-09:30	3.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative) led by Coordinator	
09:30-11:00	3.2 Understanding map making <ul style="list-style-type: none">• Cartographic evolution• Map classification• Map elements• Principles of map design	Dr. B. K. Kar Geography Dept., Gauhati University
11:00-11:30	Tea Break	
11:30-13:00	3.3 Extracting data - georeferencing and extraction of data	Dr. D. Sahariah Geography Dept., Gauhati University
13:00-14:00	Lunch	
14:00-15:30	3.4 Ex: Georeferencing (Use IGET_GIS_003)	Dr. D. Sahariah Geography Dept., Gauhati University
15:30-16:00	Tea	
16:00-17:30	3.5 Ex: Extracting data (Use IGET_GIS_004)	Dr. D. Sahariah Geography Dept., Gauhati University
17:30-17:45	3.6 Fill in feedback forms	

Day- 4 Date 06/07/2019 Saturday

09:00-09:30	4.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative) led by Coordinator	
9:30-11:00	4.2 Understanding data quality <ul style="list-style-type: none">• Elements of data quality• Sources and types of errors in geospatial data building• Importance of metadata	Dr. A. Saikia Geography Dept., Gauhati University
11:00-11:30	Tea Break	
11:30-13:00	4.3 Group exercise on analysis of good and bad maps with reasons (to be based on map design principles)	Dr. M.J. Nath Geography Dept., Gauhati University
13:00-14:00	Lunch	
14:00-15:30	4.4 Ex: Map preparation (Use IGET_GIS_006)	Dr. M.J. Nath Geography Dept., Gauhati University
15:30-16:00	Tea	
16:00-17:30	Continue with ex. (IGET_GIS_006)	Dr. M.J. Nath Geography Dept., Gauhati University
17:30-17:45	4.5 Fill in Feedback Forms	

Day- 5 Date: 07/07/2019 Sunday

09:00-09:30	5.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)- led by coordinator	
09:30-11:00	5.2 Understanding attribute data <ul style="list-style-type: none">• Importance of database• Database management systems• Building attribute data	Dr. A. Saikia Geography Dept., Gauhati University
11:00-11:30	Tea Break	
11:30- 13:00	5.2 Understanding attribute data <ul style="list-style-type: none">• Importance of database• Database management systems• Building attribute data	Dr. A. Saikia Geography Dept., Gauhati University
13:00-14:00	Lunch	
14:00-15:30	5.3 Ex: Data exploration (Use IGET_GIS_007)	Dr. Krishna Das PNRD
15:30-16:00	Tea break	
16:00-17:30	5.4 Ex: Working with tables (use IGET_GIS_008)	Dr. Krishna Das PNRD
17:30-17:45	5.5 Fill in Feedback Forms	

Day- 6 Date: 08/07/2019 Monday

09:00-09:30	6.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative) – led by coordinator	
09:30-11:00	6.2 Visualizing data through queries	Dr. A. Saikia Geography Dept., Gauhati University
11:00-11:30	Tea Break	
11:30- 13:00	6.2 Visualizing data through queries & landscape metrics	Dr. A. Saikia Geography Dept., Gauhati University
13:00-14:00	Lunch	
14:00-15:30	6.3 Ex: Working with queries (use IGET_GIS_009)	Dr. Krishna Das PNRD
15:30-16:00	Tea Break	
16:00-17:30	6.4 Ex: Working with queries (IGET_GIS_010)	Dr. Krishna Das PNRD
17:30-17:45	6.5 Fill in feedback forms	

Day 7 Date: 09/07/2019 Tuesday

09:00-09:30	8.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	8.2: Types of Remote Sensing (multispectral, Thermal, microwave, hyperspectral, LIDAR (20min each) with differences	Dr. D. Sahariah Geography Dept., Gauhati University
11:00-11:30	Tea Break	
11:30-13:00	8.3 Applications of Remote Sensing	Dr. D. Sahariah Geography Dept., Gauhati University
13:00-14:00	Lunch	
14:00-15:30	8.4 Ex: Intro to SAGA (Use IGET_RS_001)	Dr. Krishna Das PNRD
15:30-16:00	Teak Break	
16:00-17:30	8.4 Ex: Intro to SAGA (Use IGET_RS_001)	Dr. Krishna Das PNRD
17:30-17:45	8.5 Fill in Feedback Forms	

Day 8 Date: 10/07/2019 Wednesday

09:00-09:30	9.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	9.2 Understanding the image – elements of visual interpretation	Dr. A. K. Bora Geography Dept., Gauhati University
11:00-11:30	Tea break	
11:30-13:00	9.3 Understanding the image -understanding image statistics	Dr. M.J. Nath Geography Dept., Gauhati University
13:00-14:00	Lunch	
14:00-15:30	9.4 Ex: Image interpretation (Use IGET_RS_002)	Dr. N. Chetry Earth Science Dept., USTM
15:30-16:00	Tea break	
16:00-17:30	9.5 Ex: Understanding the image (histogram) (Use IGET_RS_003)	Dr. N. Chetry Earth Science Dept., USTM
17:30-17:45	9.6 Fill in Feedback	

Day 9 Date: 11/07/2019 Thursday

09:00-09:30	10.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	10.2 Geometric correction	Dr. K. Roychoudhury Presidency University
11:00-11:30	Tea break	
11:30-13:00	10.3 Atmospheric and Radiometric corrections	Dr. S. Chatterjee Presidency University
13:00-14:00	Lunch	
14:00-15:30	10.4 Ex: Image registration (use IGET_RS_0004)	Dr. N. Chetry Earth Science Dept., USTM
15:30-16:00	Tea break	
16:00-17:30	10.4 Ex: Image registration (use IGET_RS_0004)	Dr. N. Chetry Earth Science Dept., USTM
17:30-17:45	Fill in Feedback Form	

Day 10 Date: 12/07/2019 Friday

09:00-09:30	11.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	11.2 : Introduction to image enhancements <ul style="list-style-type: none">• Contrast enhancements• Band rationing• Spatial filtering• Principal Components Analysis;• Vegetation Indices	Dr. B. Handique NESAC
11:00-11:30	Tea Break	
11:30-13:00	11.2 Digital image classification	Dr. B. Handique NESAC
13:00-14:00	Lunch	
14:00-15:30	11.3 Ex: Working with images – subsetting and mosaicking (Use IGET_RS_005)	Dr. N. Chetry Earth Science Dept., USTM
15:30-16:00	Tea	
16:00-17:30	11.4 Ex: Using enhancements (use IGET_RS_006)	Dr. N. Chetry Earth Science Dept., USTM
17:30-17:45	Fill in Feedback Forms	

Day 11 Date:13/07/2019 Saturday

09:00-09:30	7.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-10:15	Applications of remote sensing in the cryosphere	Dr. U D Baruah Geography Dept., Gauhati University
10:15-11:00	7.2 Introduction to GPS	Dr. U D Baruah Geography Dept., Gauhati University
11:00-11:30	Tea	
11:30-13:00	7.3 Ex: Field exercise for collecting points using GPS	Dr. Kuleshwar Sinha Assam Forest Dept
13:00-14:00	Lunch	
14:00-15:30	7.4 Ex : Importing GPS data into QGIS (Use IGET_GIS_011)	Dr. U D Baruah Geography Dept., Gauhati University
15:30-16:00	Tea	
16:00-17:30	7.5 Ex: Using Google Earth / Bhuvan (Use IGET_GIS_012)	Dr. Kuleshwar Sinha Assam Forest Dept
17:30-17:45	Fill in Feedback Forms	

Day 12 Date: 14/07/2019 Sunday GPS Exercise**Dr. Kuleshwar Sinha
Assam Forest Dept****Day 13 Date: 15/07/2019 Monday**

09:00-09:30	12.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	12.2 Introduction to image classification: Unsupervised	Dr. A. Saikia Geography Dept., Gauhati University
11:00-11:30	Tea break	
11:30-13:00	12.3 Introduction to image classification: Supervised	Dr. A. Saikia Geography Dept., Gauhati University
13:00-14:00	Lunch	
14:00-15:30	12.4 Ex: Extracting information for satellite image using unsupervised classification (Use IGET_RS_007)	Dr. M.J. Nath Geography Dept., Gauhati University
15:30-16:00	Tea break	
16:00-17:30	12.4 Ex: Extracting information for satellite image using unsupervised classification (Use IGET_RS_007)	Dr. M.J. Nath Geography Dept., Gauhati University
17:30-17:45	12.5 Fill in Feedback Forms	

Day 14 Date:16/07/2019 Tuesday		
09:00-09:30	13.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	13.2 Accuracy assessment : Why and How	Mr. Chandrakant Pawe Geography Dept. Pragjyotish College
11:00-11:30	Tea break	
11:30-13:00	13.3 Ex: Extracting information for satellite image using supervised classification (Use IGET_RS_008)	Dr. M.J. Nath Geography Dept., Gauhati University
13:00-14:00	Lunch	
14:00-15:30	13.3 Ex: Extracting information for satellite image using supervised classification (Use IGET_RS_008)	Dr. M.J. Nath Geography Dept., Gauhati University
15:30-16:00	Tea break	
16:00-17:30	13.4 Ex: Accuracy assessment (Use IGET_RS_009)	Dr. M.J. Nath Geography Dept., Gauhati University
17:30-17:45	13.5 Fill in Feedback forms	

Day 15 17/07/2019 Wednesday

09:00-09:30	14.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	14.2 Change detection	Dr. B. Handique NESAC
11:00-11:30	Tea	
11:30-13:00	14.3 Understanding terrain data	Dr. S. Ojha Nagaon Girls' College
13:00-14:00	Lunch	
14:00-15:30	14.4 Ex: Terrain analysis (Use IGET_RS_010)	Dr. S. Ojha Nagaon Girls' College
15:30-16:00	Tea break	
16:00-17:30	14.5 Ex: Change detection with SAGA (use IGET_RS_011)	Khangsembou Bungnamei, Research Scholar, GU
17:30-17:45	14.6 Fill in Feedback forms	

Day 16 Date:18/07/2019 Thursday

09:00-09:30	15.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	Application of RS and GIS in Urban Studies	Dr. Shahab Fazal Aligarh Muslim University
11:00-11:30	Tea break	
11:30-13:00	15.2 Spatial data analysis	Dr. Shahab Fazal Aligarh Muslim University
13:00-14:00	Lunch	
14:00-15:30	15.3 Exercise on spatial data analysis (Use IGET_SA_001)	Dr. S. Ojha Nagaon Girls' College
15:30-16:00	Tea break	
16:00-17:30	15.3 Exercise on spatial data analysis (Use IGET_SA_001)	Dr. S. Ojha Nagaon Girls' College
17:30-17:45	15.4 Fill in Feedback forms	

Day 17 Date: 19/07/2019 Friday

09:00-09:30	16.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	16.2 Types of Remote Sensing (Multispectral, Thermal, microwave, hyperspectral, LIDAR and Drones)	Dr. Victor Saikhom NESAC
11:00-11:30	Tea	
11:30-13:00	16.3 Demonstration on drones	Dr. Victor Saikhom NESAC
13:00-14:00	Lunch	
14:00-15:30	16.4 Mapping with drones	Dr. Chirag Gupta NESAC
15:30-16:00	Tea	
16:00-17:30	16.5 Mapping with drones	Dr. Chirag Gupta NESAC
17:30-17:45	16.6 Feedback	

Day 18 Date: 20/07/2019 Saturday

09:00-09:30	17.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	17.2 Applications on RS/GIS in planning (urban/rural) with specific case studies highlighting detailed methodology	Dr. Kalyanjit Sharma ARSAC
11:00-11:30	Tea	
11:30-13:00	17.3 Applications of RS/GIS in natural resource management (forest, wildlife/agriculture/watershed) with specific case studies highlighting detailed	Dr. P.K. Sharma Geography Dept., Mangaldoi College
13:00-14:00	Lunch	
14:00-15:30	17.4 Applications of RS/GIS in climate studies with specific case studies highlighting detailed methodology	Dr. Kiran Sharma IIM, Shillong
15:30-16:00	Tea	
16:00-17:30	17.5 Group exercise: Participants to make a methodology flow chart for given applications	Dr. D. Sahariah Geography Dept., Gauhati University
17:30-17:45	17.6 Feedback	

Day 19 Date: 21/07/2019 Sunday

09:00-09:30	18.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	18.2 Discussion of possible minor projects to be done by the participants. Institutions to give projects according to data available with them or using data that can be generated easily.	Dr. A. Saikia Geography Dept., Gauhati University
11:00-11:30	Tea	
11:30-13:00	18.2 Discussion of possible minor projects to be done by the participants.	Dr. D. Sahariah Geography Dept., Gauhati University
13:00-14:00	Lunch	
14:00-15:30	18.3 Working on projects	Dr. M.J. Nath Geography Dept., Gauhati University
15:30-16:00	Tea	
16:00-17:30	18.3 Working on projects	Dr. A. Saikia Geography Dept., Gauhati University
17:30-17:45	18.4 Filling in feedback forms	

Day 20 Date: 22/07/2019 Monday		
09:00-09:30	Feedback (analysis to be done by participants and presented – quantitative and qualitative)	
09:30-11:00	Working on projects	Dr. D. Sahariah Geography Dept., Gauhati University
11:00-11:30	Tea	
11:30-13:00	Working on projects	Dr. M.J. Nath Geography Dept., Gauhati University
13:00-14:00	Lunch	
14:00-15:30	Working on projects	Dr. A. Saikia Geography Dept., Gauhati University
15:30-16:00	Tea	
16:00-17:30	Working on projects	Dr. D. Sahariah Geography Dept., Gauhati University
17:30-17:45	Filling in feedback forms	
Day 21 Date:23/07/2019 Tuesday		
09:00-10:00	Working on projects	Dr. M.J. Nath Geography Dept., Gauhati University
10:00-13:00	Final project presentation by participants (group wise) including tea break	
13:00-14:00	Lunch	
14:00-15:30	Feedback and Valedictory	Dr. D. Walia Environmental Science Dept., NEHU