

Short-term course on Introduction to GNSS & its Applications

November 25-29, 2024



Organized by

National Centre for Geodesy
Indian Institute of Technology Kanpur
Kanpur-208016, Uttar Pradesh
www.iitk.ac.in/ncg

About the course

Global Navigation Satellite Systems (GNSS), including GPS, GLONASS, GALILEO, BEIDOU, QZSS, and IRNSS, comprise constellations of Earth-orbiting satellites that continuously broadcast radio signals on multiple frequencies. These signals enable the precise three-dimensional positioning of any point on Earth. From navigation and timing services in aviation and agriculture to critical applications like plate motion studies and geodesy, GNSS plays a vital role in modern technology. This course provides an in-depth understanding of GNSS, emphasizing hands-on training using BERNESE Software, a scientific multi-GNSS data processing tool developed by the University of Bern. This powerful software facilitates applications such as precise point positioning (PPP), baseline processing, and network solutions for delivering high-precision results for advanced geodetic research. Participants will explore the mathematical foundations of GNSS and gain practical skills through intensive sessions using BERNESE 5.4, preparing them to leverage GNSS for a wide array of professional applications.

Objective

This course aims to enhance participants' understanding of GNSS by blending theoretical concepts with hands-on data processing. A major highlight is the in-depth training on BERNESE 5.4, a leading multi-GNSS analysis scientific software. Participants will master key functions such as precise point positioning (PPP), baseline processing, and network processing. By the end of the course, participants will have the expertise to apply GNSS techniques in their professional endeavors.

Course material

Course material such as lecture slides, e-books, hands-on manuals, etc., will be provided during the course.

About NCG

The National Centre for Geodesy (NCG) at the Indian Institute of Technology Kanpur (IITK) was established on July 1, 2019, with the support of the Department of Science and Technology (DST), Government of India. The primary objective of the NCG is to enhance and strengthen activities in the field of geodesy through education, capacity building, academic research and development. To achieve its objective, the NCG focuses on the following key activities:

- Organizing outreach activities, building capacity in geodesy through regular short and long-term training programs, preparing well-trained PG students and professionals, developing courses and reference materials, and disseminating relevant information in geodesy.
- Conducting state-of-the-art research and development activities (academic research, sponsored/consultancy projects) in geodesy.
- Acting as the national resource centre for supporting students and researchers from various universities and institutions by providing laboratory equipment, training, library resources, and software, as well as advising state and central government departments on all matters related to geodesy.

Who will benefit from this course

The course is designed for professionals from government and private organizations, faculty, members, researchers, young professionals and students desirous of learning GNSS and its applications.

Course duration and structure

The course spans five days, featuring two 75-minute lectures every day in the first half, followed by a 3-hour hands-on lab session in the afternoon. Key topics to be covered in the course are as follows:

- Reference systems
- GNSS introduction, observation equations and network adjustment
- Fundamentals of least squares for GNSS processing
- Positioning and navigation
- GNSS augmentation
- Indian CORS network
- Applications of GNSS
- Hands-on GNSS data processing training using BERNESE 5.4

How to apply

To register, please follow the following steps:

- Fill out the Google application form at the following link: <https://forms.gle/yiDazpVJ7ntqCVaQ8>
- You must also provide details of payment of the registration fee in the application form to complete the registration process

Please note that no offline applications will be accepted. Number of seats is limited to 25. Hence, the registration will be on the first-come-first-served basis.

NCG, as the nodal centre, is working in tandem with six other Regional Centres for Geodesy (RCGs) at MANIT Bhopal, MNNIT Allahabad, IIST Trivandrum, IIT(ISM) Dhanbad, IIT Bombay, and Anna University to promote capacity building and R&D activities aiming to become a hub of excellence in geodesy and allied areas.

Course coordinators

Dr. Onkar Dikshit

Professor, Department of Civil Engineering & Coordinator, National Centre for Geodesy Indian Institute of Technology Kanpur

Maj. Gen. Dr. B. Nagarajan

Professor, Department of Civil Engineering Indian Institute of Technology Kanpur

Contact details

For more details and further clarifications, you may contact us:

Email: ncg@iitk.ac.in

Phone: 0512-2596417

Location

IIT Kanpur is about 15 km from the Kanpur Central Railway Station and 17 km from Kanpur Airport. The city is well connected by road, rail, and air. For more information, kindly visit:

<https://www.iitk.ac.in/cce/how-to-reach-iitk.php>

We encourage you to apply promptly to secure your place.

Important dates:

| | |
|-----------------------|-------------------|
| Application last date | November 15, 2024 |
| Course start date | November 25, 2024 |
| Course end date | November 29, 2024 |

Course fee

The course fee is ₹25,000, which includes course material, handouts, institute overheads and GST. Participants can make the registration fee payment through SBI Collect using the procedure explained on the following link:

<https://drive.google.com/drive/folders/1MRBkK5KdSyHqqrCDHa0heFGTu7SKrDPP?usp=sharing>

Please ensure to share the payment receipt details in the online Google form.

Accommodation

Participants are responsible for their own boarding and lodging charges at the Guest House, IIT Kanpur. Accommodation can be arranged at Guest House, IIT Kanpur in single/double occupancy. The request for accommodation must be indicated in the google registration form.

Tariff at Guest House:

- Single Occupancy: ₹1,500 per day
- Double Occupancy: ₹2,000 per day

Course certificate

Participation certificate will be given to the candidates attending all the lectures and labs.