



International Committee on  
Global Navigation Satellite Systems

CSIS

GIC

# Training on GNSS - Course: T151 - 40

## Jointly Organized by GIC/AIT, CSIS/UT and ICG

### Introduction

The Global Positioning System (GPS) is widely used in almost all systems that require absolute position and time. It is due to its accuracy, availability and reliability. In addition to GPS of the United States, several other systems such as GLObal Navigation Satellite System (GLONASS) of the Russian Federation, the European global navigation system (Galileo) of the European Union, the BeiDou Navigation Satellite System (BDS) of China, the Indian Regional Navigation Satellite System (NavIC), India and the Quasi-Zenith Satellite System (QZSS), Japan are now available. Collectively, they are called GNSS (Global Navigation Satellite System). Today, a GNSS receiver can provide centimeter level accuracy even with a low-cost receiver, if an error correction technique is used. Thus, availability of low-cost and high-accuracy receivers will eventually increase GNSS related applications and its market. In order to keep the pace with these new applications and technological developments, it is necessary to develop human resources and skills.

Geoinformatics Center of Asian Institute of Technology (GIC/AIT) together with the Center for Spatial Information Science of The University of Tokyo (CSIS/UT) and International Committee on GNSS (ICG) are taking initiatives to create awareness on GNSS and its applications in Asia and the Pacific region. This training course is a part of this initiative.

**Course Schedule : 06 - 10 January, 2020**

**Training Place : AIT Conference Center,  
Asian Institute of Technology,  
Pathum Thani, Thailand**



### Objectives

This course is designed to give the participants:

1. An introduction to GNSS, comprised of GPS, GLONASS, GALILEO, BDS, QZSS and NavIC
2. Introduction to RTKLIB and related software for High-Accuracy GNSS Data Processing (RTKDROID, SW MAPS, GNSS Analysis APP, GNSS Logger etc)
3. Field Survey using Low-Cost receiver for High-Accuracy positioning
4. GNSS Data Processing for real-time and Post-processing RTK
5. Data Processing based on PPP using QZSS MADOCA signal\* (see notes below)
6. GNSS Raw Data Processing logged by Android Device

\* Note: This will be done only if low-cost MADOCA receiver and software are available. It is under development currently.

About 30% of total time will be allocated for theoretical lectures, 60% of time for hands-on training and 10% of time for team-based project work.

Applications can be downloaded from:

<http://geoinfo.ait.ac.th/gnss-training-2020/>

### Application Deadlines:

**With Funding : 9<sup>th</sup> NOV 2019**

**Without Funding : 2<sup>nd</sup> DEC 2019**

Past Training and Additional Information:

<http://www.csis.u-tokyo.ac.jp/~dinesh/>

### FIND US:

[www.geoinfo.ait.asia](http://www.geoinfo.ait.asia)

[www.facebook.com/gicait](https://www.facebook.com/gicait) [www.twitter.com/gicait](https://www.twitter.com/gicait)

For further information, please contact:

Training Coordinator,

Geoinformatics Center,

Asian Institute of Technology,

P.O.Box 4, Klong Luang, Pathumthani 12120,

Thailand. T : +66 2524 5580 E : [geoinfo@ait.asia](mailto:geoinfo@ait.asia)



## Participants

This course is designed to those who would like to learn about GNSS from the basics. We recommend to attend this course if your work is related with one of the following fields - Surveying, Mapping, GIS, Remote Sensing, Telecommunications, Safety and Security services, Geodesy, Transport, Logistics, Agriculture, Marine, Fishery, Aviation, Census Data Analyst, Health Data Analyst, Location Based Services (LBS) or APP developers.

## Benefits

Upon completion of this course, participants will be able to understand about how a GNSS receiver works, its applications, survey methods and data processing for high-accuracy in real-time or post-processing modes.

## Accommodation and Logistics

Participants can stay at the AIT Conference Center with a tariff of US\$ 40-50/night/person. Travel time from the Suvarnabhumi International Airport to AIT is usually one hour. Living cost inside the AIT campus is very reasonable and lunch/dinner cost may vary from 3 USD to 5 USD per meal.

## Insurance

Participants are requested to obtain travel and medical insurance before entering in to Thailand.

## Course Schedule

**6 - 10 JAN 2020 (5 days, 40 hours)**

## Training Costs:

**The training fee is free for all participants.**

**The participants have to bear the following costs:**

1. Travel costs from the participant's home town to AIT, Thailand and back to home town.
2. Hotel accommodation at AIT Center Hotel for the whole seminar/workshop period
3. All expenses for food, insurance, medical emergencies etc.
4. Any other expenses if any not listed here to cover the participant's expenses

## Funding

Co-organizers have kindly agreed to provide limited financial assistance for travel for eligible participants and preference is given to participants from developing countries. Financial assistance will cover the travel costs only, and will NOT include expenses such as accommodation, food, insurance, medical emergencies etc.

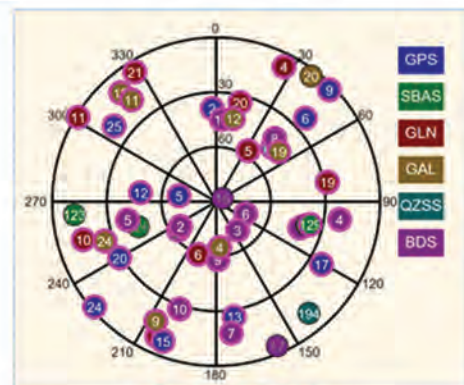
The organizers reserve the right to selecting the participants for granting the financial assistance for travel.

## Deadline for Applications:

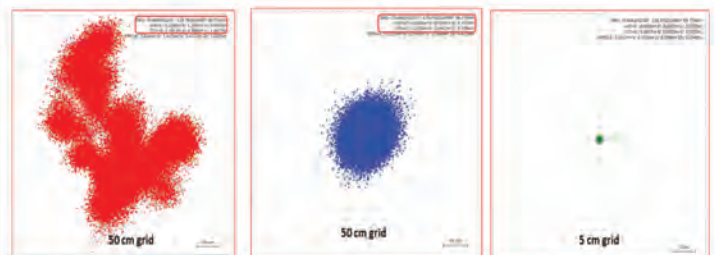
Requesting for travel funding: **9<sup>th</sup> NOV 2019**

Self Funding

**2<sup>nd</sup> DEC 2019**



Visible Satellites

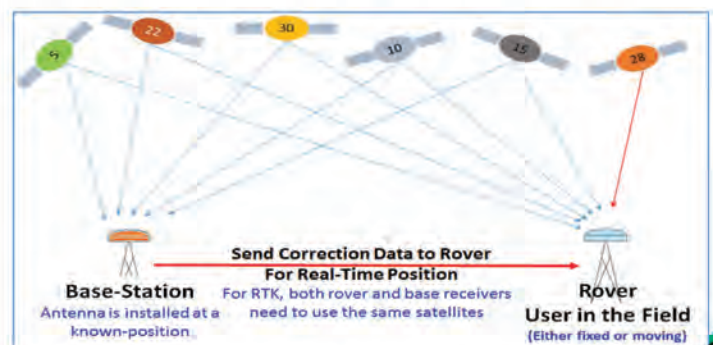


SPP (Single Point Position)

DGPS (Differential GPS)

RTK (Real Time Kinematic)

**How to improve accuracy from 10 m to 10 cm**



DGPS Principle