

RESEARCH AND TRAINING UNIT FOR NAVIGATIONAL ELECTRONICS

OSMANIA UNIVERSITY - HYDERABAD 500007

A 4-Day Short Course on

GNSS SIGNALS, RECEIVER ALGORITHMS AND APPLICATIONS

(Course Code: NERTU/SC/61)

(16-19, DECEMBER 2015)



SPEAKERS

1. Dr. K.S. Parikh, Deputy Director, SAC
2. Shri L Mruthyunjaya, Head, SN-PMO, ISAC
3. Prof. K. Deergha Rao, VCE, Hyderabad
4. Dr. Arjun Singh, Shakthi Aviation
5. Prof. Sasibhushana Rao, ECE, AU
6. Shri M. Kannan, RCI-DRDO
7. Prof. Qudussa Sultana, DCE, Hyderabad
8. Dr. Lalitha Vadlamani, IIT, Hyderabad
9. Prof. P. Laxminarayana, NERTU, OU

And some more engineers/scientists from ISRO and other research organizations are yet to be confirmed.

COORDINATOR

Prof. P. Laxminarayana, Director, NERTU

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Dates: December 16-19, 2015

Time: 09.00AM – 06.00PM

Location: NERTU Auditorium, OU

Registration Fee

Rs. 3,000/- for Full Time Students

Rs. 6,000/- for Teachers

Rs. 9,000/- for Scientists from Research Organizations

Rs. 15,000/- for Engineers from Industries and commercial organizations

DD/Cheque should be drawn in favor of

The Director, NERTU, OU.

Limited Accommodation: Available at university guest house on payment basis.

Last Date for Registration: December 10, 2015

More Details and Registration Form at

www.osmania.ac.in or

<http://www.uceou.edu>

Contact the Co-Coordinator

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Course Overview

At present two GNSS systems, GPS and GLONASS are in full operation and COMPASS, Galileo and Indian Regional Navigational Satellite system (IRNSS) are available partially. GPS, GLONASS and COMPASS are operated by departments of defence of the USA, Russia and China respectively. WAAS, EGNOS and MSAS are augmentation systems to GPS to improve the accuracy, continuity and integrity in their regions. GAGAN is also similar system developed by India. QZSS is the Japan's Regional Navigational Satellite system cum augmentation system.

At present 4-satellites (out of 7 satellites for full operation) of IRNSS are available for positioning. The unique Geostationary Earth Orbit (GEO) / Geo Synchronous Orbit (GSO) constellation design provides a position accuracy of better than 15 metre for longer duration of 20 hours in a day even with 4 satellites. Director General of Civil Aviation (DGCA) certified GAGAN for enroute operations (RNP 0.1) on December 30, 2013 and subsequently on April 21, 2015 for precision approach services (APV 1). APV1 Certified GAGAN signals are being broadcast with effect from May 19, 2015.

Many GNSS signals will be available in the space and it is proposed to have a single receiver for all systems, which will compliment or alternative to the other systems, as and when the signals of a system are not available. However the present hardware receivers are not flexible to upgrade/modify them. Software based receivers are also useful for simulating and verification of newly proposed algorithms of receiver. Therefore an idea of GNSS Software Defined Receiver (GNSS-SDR), is proposed. Software-based GNSS receivers are the focus of current research because of their reprogramming ease and flexibility. Sampling an incoming wideband signal will allow the receiver to capture more navigation signals from different bands/systems. Several research groups have presented their ideas and contributions on software receivers for GPS, GLONASS and Galileo. There are many challenges in SDR, to make the algorithms to run in real time.

The main objective of the course is to give the basic concepts of the GNSS software receiver. The topics to be covered are: Basics of signal processing and communication, Signal structure of GNSS systems, Overview of GNSS receiver, Antennas and front ends, Signal Acquisition, Carrier and Code Tracking, Data Processing, Navigation Solution, Kalman Filtering and assisted GPS, GNSS and INS integration.

Expected Participants

Targeted participants are working engineers, scientists, academicians, research scholars and students interested to work or do the research in software radio or GNSS receivers. Participants are expected to have the UG level knowledge in digital signal processing and communication engineering.

About NERTU

The Research and Training Unit for Navigational Electronics (NERTU) is established in 1982. It is the focal point for research and training in the areas of Electronic Navigation in India. Since its inception, NERTU has successfully executed 47 sponsored and consultancy projects funded by DRDO, ISRO, DST, MIT, ECIL, HAL, BEL, AICTE and ASL. Currently, several projects in different areas related to navigation, signal processing and communications are in progress. It has also conducted 60 short term courses/workshops/conferences on various topics of signal processing, communications and Navigation.

Interested candidates can download the registration form from www.osmania.ac.in or <http://www.uceou.edu> and send the filled form along with DD/Cheque, before **December 10, 2015**, to "The Coordinator, GNSS-15, Research and Training Unit for Navigational Electronics (NERTU), Osmania University, Hyderabad 500007".