RESEARCH AND TRAINING UNIT FOR NAVIGATIONAL ELECTRONICS
OSMANIA UNIVERSITY – HYDERABAD

A Semester Course on GNSS SIGNAL PROCESSING : ALGORITHMS AND PROGRAMMING
(GNSS-26-01 : Code : NERTU/SC/89)
April-July 2026 (Weekly Twice, Tuesday 03.30PM-05.30PM and Friday 08.30AM-10.30AM)

Introduction: GNSS has become a ubiquitous technology, including the sectors related to surveying, defence, unmanned vehicles, agriculture, timing & synchronization, aviation, road, rail and sea transport. There may not be any area left without using GNSS chips or technology. i.e. GNSS receivers or chips became part and parcel of our day-to-day life along with commercial organizations, industries and scientific research. The global GNSS market is expected significant growth with annual shipments of receivers/chips to rise from 1.8 billion in 2021 to 2.5 billion by 2031. While the usage of GNSS technology is increasing, threats are also increasing with GNSS technology due to denial of GNSS signals, jamming spoofing etc. Therefore, scientists and engineers are focusing to develop alternative technologies or augmentation to GNSS for smooth navigation with the required availability, continuity and integrity. So, several industries and research organizations are looking for people having exposer to signal processing, communication and navigation with sufficient skills in development of algorithms and software or programming.

A semester course on GNSS Signal Processing: Algorithms and Programming

The main intention of the school is to develop the required skills to do research and develop the navigation technologies by training them in the GNSS signal Processing with algorithms and software (programming) development. The school is designed for the engineers, scientists, academicians and research scholars, already working or decided to develop the GNSS receivers, navigation systems and their applications.

This school will cover tentatively the following lectures, demos, practicing assignments at home, their evaluation and guidance/feedback. Review of GNSS Signals, Receiver Overview, Antennas, RF Front ends, Acquisition, Tracking, Navigation Data Decoding, Computation of Pseudoranges and Pseudorange Rates and Navigation Solution, RAIM and TRAIM. Multipath Effects and Interference, Jamming and Spoofing, Code and Carrier Phase Measurements, Advanced Tracking Algorithms.

This is an intensive school/course. Homework/Assignments will be given and submitted solutions will be evaluated and grading will be marked in the certificate. This will be the pre-requisite for the course on "Integrated Navigation with GNSS, INS and other auxiliary sensors like barometer, magnetometer etc., to be conducted in the next semester, Jul-Nov, 2026.

Faculty of the School : Prof. Parayitam Laxminarayana, Director of Research and Training Unit for Navigational Electronics, Osmania University, Hyderabad 500007. Few experts working in this area, will be invited to give few guest lectures.

About NERTU: The Research and Training Unit for Navigational Electronics (NERTU) was established in 1982. It is the focal point for research and training in the areas of Electronic Navigation in India. It is the first University Research Center to work in Global Positioning System (GPS) and GPS Aided Geo Augmented Navigation (GAGAN) System. Since its inception, NERTU has successfully **executed 65 sponsored and consultancy projects; and 85 short term courses, conferences and workshops in the areas of** signal processing, communications and navigation. All the sponsored projects and participants of the courses are from various organizations like DRDO labs, ISRO labs, DST, MIT, ECIL, HAL, BEL, AICTE, ASL, other R&D and academic institutions. Recently NERTU has developed the MATLAB based Real Time NavIC Software Receiver running on PC; and loosely and tightly coupled integration of GNSS/NavIC and MEMS IMU and ready to develop the commercial products through Transfer of Technology to industries. At present NERTU is working on development of GNSS simulators and Ultra tightly Coupled Integration of GNSS/NavIC and MEMS IMUs.

Venue: NERTU Auditorium, OU (Online only for exceptional cases)

Registration Fee : (including 18% GST in brackets).

Full Time Students		Faculty /Academicans		Scientists & Engineers from R&D, Industry	
In Person (Rupees)	Online (Rupees)	In Person (Rupees)	Online (Rupees)	In Person (Rupees)	Online (Rupees)
15,000 (17,700)	30,000 (35,400)	20,000 (23,600)	30,000 (35,400)	25,000 (29,500)	40,000 (47,200)

Encouraging the participants with physical presence. But for the benefit of working engineers, scientists and faculty working at different organizations, choice is given for online participation. However, the students are permitted only with physical presence with substantially reduced price of registration fee.

Online payment through NEFT to "Research and Training Unit for Navigational Electronics"

Within India: A/C No.: 52198270713 IFSC: SBIN0020071, Osmania University Branch, State Bank of India

Through UPI ID: 52198270713@sbin0020071.ifsc.npci

Outside India: A/C No.: 52198270713 Swift Code: SBININBBH09, Osmania University Branch, State Bank of India

For Registration or expression of interest for participation or for more details like Speakers, topics, final schedule, accommodation updates are available at https://nertu.osmania.ac.in/workshop.html

Last Date for Registration is March 28, 2026

COORDINATORS, GNSS-26-01:

Prof. P. LAXMINARAYANA, Director, NERTU, OU, Ph: 949 080 5486, **laxminarayana@osmania.ac.in**

Dr. S. SARASWATHI, NERTU, OU, Ph: 994 899 1235, sirikondasaraswathi@osmania.ac.in