# RESEARCH AND TRAINING UNIT FOR NAVIGATIONAL ELECTRONICS
# OSMANIA UNIVERSITY - HYDERABAD

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| **4-Day Short Course on**<br>**GNSS TECHNOLOGIES: FUNDAMENTALS & APPLICATIONS** | **Course Code: NERTU/SC/75**<br>**05-08, SEPTEMBER 2019** |
| **2-Day Symposium on**<br>**TRENDS IN GNSS RESEARCH** | **Course Code: NERTU/SC/76**<br>**08-09, SEPTEMBER 2019** |
| **5-Day School on**<br>**GNSS AND IRNSS SOFTWARE RECEIVER: SIGNAL PROCESSING AND ITS APPLICATIONS** | **Course Code: NERTU/SC/77**<br>**09-13, SEPTEMBER 2019** |

**Location    : NERTU Auditorium, OU**

**Time        : 09.00AM – 06.00PM**

**Faculty for Course and School**

1. Prof.P.Laxminarayana, NERTU, OU
2. Prof.A.D.Sarma, CBIT
3. Prof.Sasibhushana Rao, ECE-AU
4. Dr.Venkata Ratnam, KLU
5. Dr.P. Banerjee, NPL (Rtd.)
6. Dr.Nitin Sharma, BITS, Goa
7. Dr.Anindya Bose, Burudwan University
8. Dr.Arjun Singh, Sakthi Aviation
9. Sri.L.Mruthyanjaya **(YTC),** URSC-ISRO
10. Dr.K.S.Parikh, SAC-ISRO
11. Mr.Ankesh Garg **(YTC)**, SAC-ISRO
12. Deepak Putrevu, SAC-ISRO
13. Smt. Saumi De **(YTC)**, SAC-ISRO
14. Dr. Nirvikar Dashora, NARL_ISRO
15. Dr.Rammurthy, TSFD
16. Dr. Mahesh, AAI
17. Dr.K.Satyanarayana, Rtd.Prof, BME-OU
18. Narayan Panigrahi, CAIR-DRDO
19. IISM-SoI **(YTC)**

**\*YTC: Yet To Confirm**

**Last Date for Registration: 24th August 2019**

**Please see the Registration form and other details@ www.osmania.ac.in or www.uceou.edu**

**CO-COORDINATORS, GNSS-19**

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**COORDINATOR, GNSS-19**

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

**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. GPS chips are also proposed to use in the Applications of Internet of Things in the Industry and other organizations to know the location of sensors and devices. The demand for precise location information with the ongoing evolution of GNSS technology, is expected to grow from 5 billion to 8 billion Euros by 2020. The business can be divided into Development of GNSS chipsets and the Integration of GNSS chipsets with different applications. This is the high time in India to develop GNSS chipsets and also applications with GNSS chipsets.

**4-Day Short Course on GNSS Technologies: Fundamentals & Applications:** **The main objective of this course is** to introduce the basic concepts and advances in the GNSS Technologies, its applications and limitations. This course will cover the topics: Principle of operation, architecture and signal structure of GPS, GLONASS, Galileo, Compass and NavIC; Errors in GPS or GNSS; DGPS, augmentation systems, Applications of GNSS. specifications of a GNSS receiver, and integration of GNSS receiver or a GNSS chip with other applications. **This course is open for all candidates, who are interested to develop new GNSS applications.**

**2-Day Symposium on Trends in GNSS Research:** After successful launch of IRNSS satellites, many research groups are working for development of GNSS/IRNSS receivers and applications in industry, R & D and academic institutions. However all these groups are working isolated. **The main objective of this symposium is to bring together and create a network of GNSS community in India and share their research activities in GNSS.** The heads of each group developing a product or doing research in India in any organization are invited to send an abstract for giving half an hour talk on their activities. Similarly, research scholars or PG students are also invited to send abstract for presenting their research work for 15 minutes. There may be a panel discussion on GNSS research and development in India.

**5-Day School on GNSS and IRNSS Software Recever: Signal Processing and Its Applications:** Though many people are using GPS or GNSS for navigation and other applications, very few people are working to develop the GNSS receivers and simulators in India. Development of GNSS receiver requires the expertise in Signal Processing, Communication and navigation algorithms. **The main objective of the course is to give the basic concepts and advances in the development of GNSS Software Receiver with emphasis on IRNSS**. As the course is designed with intensive practice, **only the engineers, scientists, academicians and research scholars, already working or decided to work in the development of GNSS receiver or its applications are encouraged to register for the school.** Participants are expected to have the UG level knowledge in signal processing and communication engineering. The participants have to bring their own laptop for participating in the school.

**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. It is the first University centre to work in the area of 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 also 75 short term courses, conferences and workshops in the areas of** signal processing, communications and navigation. All the participants of the courses or sponsored projects are from various organizations like DRDO labs, ISRO labs, DST, MIT, ECIL, HAL, BEL, AICTE, ASL, other R &D and academic institutions.

| Registration Fee (including GST 18%) | 4-Day Course | 2-Day Symposium | 5-Day School | Course & Symposium | Symposium & School | Course, Symposium & School |
|---|---|---|---|---|---|---|
| Studensts (Full Time) | 3000 (3540) | 2000 (2360) | 5000 (5900) | 4000 (4720) | 6000 (7080) | 8000 (9440) |
| Faculty | 5000 (5900) | 3000 (3540) | 10000(11800) | 7000 (8260) | 12000 (14160) | 15000 (17700) |
| Scientists & Enginers from R&D, Industrty | 8000 (9440) | 5000 (5900) | 20000 (23600) | 10000 (11800) | 22000 (25960) | 28000 (33040) |

# 4-Day Short Course, 2-Day Sumposium & One Week School on GNSS – 2019: Tentative Schedule

| | 09.00-10.15 | 10.15-11.30 | 12.00-13.00 | 14.00-15.15 | 15.45-17.00 | 17.00-18.00 |
|---|---|---|---|---|---|---|
| Day-1: Thursday September 05 | Inaugural Function | Keynote Address & Principle Architecture of GNSS Systems | GPS Signal Structure | IRNSS Architecture & Signal Structure Comparison of All GNSS Systems | GNSS Error Sources & DGPS | GNSS for Remnote Sensing and Weather Monitoring |
| | | | | | **Mahesh** | **Deepak Putrev** |
| Day-2: Friday September 06 | WAAS-Civil Aviation | Geodesy and Coordinate Systems | GNSS for Surveying | GNSS for Forest applications | GNSS for Timing and Frequency Synchronization | GNSS for Timing and Frequency Synchronization |
| | **Arjun singh** | **IISM-SoI** | **IISM-SoI** | **Rammurthy** | **P..Banerjee** | **P..Banerjee** |
| Day-3: Saturday September 07 | Carrier Phase Measurements | Receiver Overview & Specifications | Software Based GNSS applications for GIS | Development of GNSS Applications Using GNSS Chips | Development of GNSS Applications Using GNSS Chips | Demos |
| | **A. D. Sarma** | **Venkatratnam** | **Panigrahi** | **Satyanarayana** | **Anindya Bose** | **Anindya Bose** |
| Day-4: Sunday September 08 | GNSS Market | Presentations by Group Heads (2) | Presentations by Students (4) | Presentations by Students (4) | Panel Discussion | Social Function |
| | | | | | | |
| Day-5: Monday September 09 | Presentations by Group Heads (2) | Presentations by Students (4) | Presentations by Group Heads (2) | Presentations by Students (4) | Panel Discussion | Presentations by Students (4) |
| | | | | | | |
| Day-6: Tuesday September 10 | Overview of GNSS | GPS Signal Structure | IRNSS Overview & Signal Structure | Receiver Overview | RF front-Ends | RF front-Ends |
| | | | **L.Mruthyanjaya** | | **Parikh** | **Parikh** |
| Day-7: Wednesday September 11 | Basics of Acquisition | Basics of Tracking | Advances in Tracking Acquisition | Advances in Tracking Acquisition | Data Decoding (GPS & IRNSS) | Demos |
| | **Nitin Sharma** | | **Saumi De** | **Saumi De** | **Saumi De** | |
| Day-8: Thursday September 12 | Code and Carrier Phase Pseudorange Measurements | Computation of Satellite Position & Receiver's PVT | Computation of Satellite Position & receiver's PVT | Integration of All receiver Modules | Demos | Demos |
| | **Ankesh Garg** | **Ankesh Garg** | **Ankesh Garg** | | | |
| Day-9: Friday September 13 | Modeling Errors, Scintillations, Cycle Slips | Accuracy Measures & Characteristics of Software Receivers | Basics of GNSS & INS Integration with KF | Basics of GNSS & INS Integration with KF | **Valedictory Function** | |
| | **Nirvikar** | | **Sasibhushan Rao** | **Sasibhushan Rao** | | |

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## OSMANIA UNIVERSITY - HYDERABAD
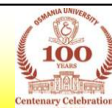
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| **2-Day Symposium on** <br> **TRENDS IN GNSS RESEARCH** | **Course Code: NERTU/SC/76** <br> **08-09, SEPTEMBER 2019** |
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## REGISTRATION FORM

| | |
|---|---|
| 1. Name | |
| 2. Designation | |
| 3. Educational Qualifications | |
| 4. Email | |
| 5. Phone | |
| 6. Organization with Address | |
| 7. Professional Experience in Years <br>    a. Teaching <br>    b. Research/Industry | |
| 8. Interested Areas of Research | |
| 9. Interested To Register for <br> (Tick the corresponding) | 1. 4-day Short Course <br> 2. 2-day Symposium <br> 3. 5-Day School |
| 10. Presentation of your work in 15 minutes in the Symposium | YES        NO |
| 11. Amount Paid <br> Tick and write Transaction No. with Date | Rs. <br> DD / Cheque / Online Payment |
| 12. Signature of the Candidate/Sponsor | |

For any details contact **CO-COORDINATORS, GNSS-19:**

**Ch.Srinu, Research Scholar, NERTU, OU,**      Ph: 903 293 0657,      sreenu471.ece@gmail.com
**S.Saraswathi, Research Scholar, NERTU, OU,**      Ph: 994 899 1235,      sirikondasaraswathi@gmail.com
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**COORDINATOR, GNSS-19, Prof.P.Laxminarayana, Director, NERTU, OU,** Ph: 949 080 5486,     laxminarayana@osmania.ac.in
**DD/Cheque** should be drawn in favor of **"The Director, NERTU, OU"**
**Or online payment through NEFT** to "The Director, Eqpt. Maint., NERTU, OU",
         **A/C No. : 52198270713, IFSC: SBIN0020071 , Osmania University Branch, State Bank of India**
Interested candidates can **download (from www.osmania.ac.in or from www.uceou.edu), fill and send the registration** form to
**nertu.courses@osmania.ac.in** and to **co-coordinators** by email or post to the following address along with DD/Cheque or online
payment receipt, before **24th August 2019,** to "**The Coordinator, GNSS-19, Research and Training Unit for Navigational
Electronics (NERTU), Osmania University, Hyderabad 500007".** Limited Accommodation is available on payment basis in the
University Guest House based on First-Come-First Served.

| Registration Fee (including GST 18%) Includes Participation in the Proceedings, Kit, Lunch, Tea and Snacks | 4-Day Course | 2-Day Symposium | 5-Day | Course & Symposium | Symposium & School | Course, Symposium & School |
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