

INTEGRATED SENSOR SYSTEMS

ADMISSION BROCHURE 2023

**INDIAN INSTITUTE OF
TECHNOLOGY HYDERABAD**



About us



- Integrated sensor systems (ISS) M.Tech program at IIT Hyderabad is an interdisciplinary postgraduate engineering course that develops manpower and technopreneurs in the area of sensors technology. Over 40 students have enrolled in this program since its beginning in 2020.
- ISS is at the forefront of a technological revolution in several key areas, which include telecommunication, sensing, smart agriculture, transportation, environment monitoring, healthcare, smart wearable, and IoT technology in Societal & Industrial Applications. This has created an ever-rising demand in industries, which lead to a globally growing need for highly skilled personnel trained in these interdisciplinary fields.
- Students at ISS, are exposed to the major emerging technologies and are adequately skilled in these domains through the diverse and broad spectrum of courses offered. The course work provides all necessary basic and applied skills for the design, fabrication, and testing of an integrated sensor system.
- The curriculum promotes multidisciplinary and high-quality research and covers Basic Concepts of Smart Materials and Devices, Analog and Mixed-Signal circuits design, Digital IC design, Micro and Nanofabrication Technologies, Circuit and Packaging, Embedded Programming, Intelligent Signal Processing using AI/IoT, and elective courses in other allied fields.
- More details can be found at the program webpage - <https://iss.cip.iith.ac.in/>

Degrees offered



Master of Technology

Teaching Assistant

Duration : 2 years



Master of Technology

Research Assistant

Duration : 3 years



Master of Technology

Self-sponsored

Duration : 2 years

Eligibility:

BE / B Tech or equivalent degree in any discipline with GATE paper in AE, BT, BM, CE, CH, EE, EC, IN, ME, MT, PH, XE OR MSc or equivalent degree in Electronics, Physics, Chemistry with GATE paper in CY, EC, IN, PH.

Selection Procedure:

The MHRD supported candidates will be selected based on **GATE Score**. Self-Sponsored and Industry sponsored candidates will be selected based on **written exam and/or interview**.

Course Credits: 52 (28 theory+ 24 thesis)

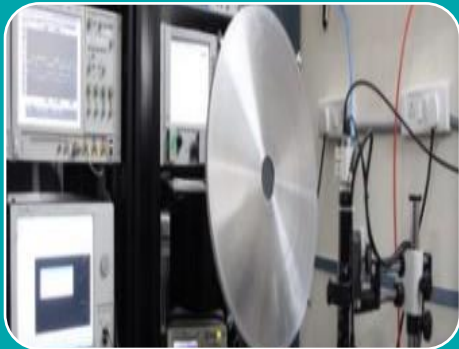
Core Courses

Smart Material and Transducers
Fabrication Technology and Characterization
Physics of low dimensional systems and quantum devices
Computational modelling techniques
Embedded Programming
Computational Modeling Techniques
Circuits and Packaging

Elective Courses

Analog IC Design
Digital IC Design
Mixed Signal Circuit Design
RF IC Design
Mesoscopic Device Physics
Nanoelectronics: Principle and Devices

Lab Facilities

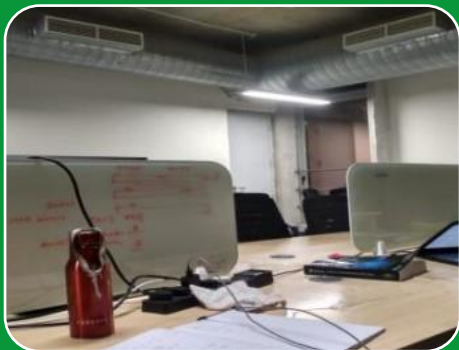


Advanced Embedded Systems and Digital IC Design Lab

Facilities available includes :

All necessary industry standard EDA tools for the complete VLSI design and verification flow from RTL design to complete back-end suite up to GDSII.

- High-end FPGA including XILINX Virtex-7, Kintex-6, Zed boards, Advanced Micro-controller kits, ARM Embedded kits, High-end Servers, world-class storage, and high-class work-stations.



Design of Analog RF Mixed Integrated Circuit Lab

- This lab allows students to work on Analog and RF projects right from designing specifications till the tape out.
- The lab has strong tie-up with semiconductor foundry like TSMC, SCL for the fabrication part.

Lab Facilities



Nano-X Cleanroom and Characterization Lab

Cleanroom is for fabrication of micro and nano devices. Students work on fabrication of antennas, sensors and MEMS devices and for characterization of IIT H developed devices we have IR characterization setup, electrical characterization, SEM and TEM.



Nano photonics Lab

This lab allows students to explore the area of Nano photonics which seeks to miniaturize optical devices on a chip scale. This helps students to believe that such miniaturization has great benefits similar to miniaturization of electronic devices.

Faculty Profiles



Dr. Naresh Kumar Emani

Ph.D: Purdue University , West Lafayette Campus

Nanophotonics
Photovoltaics,
Optoelectronic devices
Nanofabrication



Dr. Siva Rama Krishna Vanjari

Ph.D: IISc Bangalore

* Biosensors
* Electrochemistry
* MEMS
* 3D-IC



Dr. Shishir Kumar
Ph.D: Trinity College, Dublin

* Micro-nanofluidics
* Nanopores
* 2D Materials
* Bionanosensors



Dr. Gajendranath Chaudhury
Ph.D: IIT Delhi

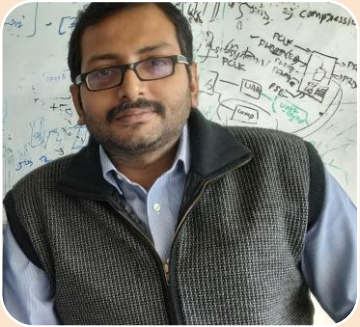
* Analog and Mixed Signal Circuit Design



Dr. Sushmee Badhulika
Ph.D: University of California

* Flexible and wearable nanoelectronics
* Nanomaterial based devices and circuits
* Paper electronics

Faculty Profiles



Prof. Amit Acharyya
Ph.D: University of Southampton, UK

- *Digital VLSI Design
- *Machine learning hardware design
- *Chip design for remote health monitoring



Dr. Prem Pal
Ph.D: IIT Delhi

- * MEMS technology, Silicon micromachining
- * MEMS-based sensors
- * Thin films
- * Solar cell



Dr. Saswata Bhattacharya
Ph.D: IISc Bangalore

- * Phase-field modeling of microstructural evolution in alloys and oxides
- * Micromechanical modelling



Dr. Suryanarayana Jammalamadaka
Ph.D: IIT Madras

- * Magnetic materials
- * Device physics
- * Spintronics
- * Data storage
- * Non volatile memory



Dr. Jyoti Mohanty
Ph.D: Paul Drude Institute / Humboldt University

- * Nano magnetism
- * Magnetic Microscopy
- * Ultrafast Magnetism

Faculty Profiles



Prof. Ashudeb Dutta
Ph.D: IIT Kharagpur

- * Analog and RF chip design
- * Energy harvesting
- * Low Noise Amplifier



Prof. Shiv Govind Singh
Ph.D: IIT Bombay

- * 3D-IC, MEMS technology
- * Nano-bio sensors
- * Lab on chip



Dr. Abhishek Kumar
Ph.D: IIT Madras

- * Analog and Radio Frequency ICs
- * Full duplex wireless communication