

# DEPARTMENT OF ELECTRICAL ENGINEERING

## ABOUT THE Ph.D. PROGRAM in ELECTRICAL ENGINEERING

The Department of Electrical Engineering (EED) at Shiv Nadar Institution of Eminence (SNIOE) was started in 2011 under the aegis of School of Engineering (SoE), Shiv Nadar University. Its vision is to establish itself as a centre of excellence in terms of research and teaching in its chosen areas. Department has identified signal processing, wireless communication, microelectronics, embedded system, machine intelligence, RF and microwave, machine drives, power electronics and power systems as its focused areas of research and teaching. With an intake of 120 students, the department offers a unified B. Tech programme in Electrical & Computer Engineering. The department offers Ph.D. program for full-time and part-time students and allow them to conduct research in both fundamental and applied areas of engineering. The department currently has 21 full-time and 2 part-time Ph.D. scholars.

## AREAS OF RESEARCH

- IoT system architecture, IoT enabling technologies, IoT communication & networking protocols. IoT for smart agriculture, smart health, and smart cities.
- SIW/ OAM/Active/ MIMO Antenna, active and passive circuit, Sub-terahertz and terahertz antennas, photoconductive antennas, 5G antennas and devices, microwave devices, slow wave structure designs for traveling wave tubes, fabrication of slow wave structures, radar based detection for medical purposes.
- Multi-antenna (MIMO) systems for next-generation wireless systems (5G/6G), 5G and beyond, wireless communication, optical wireless communications, RIS-assisted communication aspects in 5G/6G wireless.
- Machine learning based computer vision algorithms and applications such as facial expression recognition, machine learning in wireless communication, brain signal processing applications.
- Applications of universal compression and sequential change detection problems.
- Reliability-aware design of advanced computing architecture; modelling of advanced transistor architectures and on-chip interconnects, and their circuit implications, CAD algorithms for VLSI.
- Semiconductor/MEMS sensors and devices for various applications e.g. RF, biomedical, IoT etc.
- Organic and flexible electronics: organic solar cells, perovskite solar cells, and fundamental studies on charge transport in organic semiconducting materials and devices.
- Transport in semiconductor, TCAD, advanced semiconductor devices, VLSI for smart power applications.
- Electromagnetics, energy systems, photovoltaic power system, power electronics.

## RESEARCH LABORATORIES AND FACILITIES

The Department of Electrical Engineering (EED) at Shiv Nadar IoE has 14 laboratories. Some of them are state of art laboratories of their domain, RF & Microwave laboratory, Organic Electronics, and Nano electronics simulation lab. Beyond these specialized laboratories, EED provides a comprehensive range of high-end equipment and measurement setups to support a wide spectrum of research endeavours. Some of our key facilities and equipment include: software defined radios, spectrum analyser, vector network analyser, probe station, anechoic chamber, Antenna and PCB Fabrication Facility, PLC's, Power analyser, inverters, HMI devices, CompactRIO, real time PV simulator, FPGA boards. In addition to that department has computing facilities and licensed software's like MATLAB 2023 (Unlimited user), CADENCE EDA Tool, Modelsim, Tanner EDA tool, Coventware MEMS Design Tool, Santaurus TCAD, Xilinx Vivado, CST Microwave studio, DIgSilent, Ansys Maxwell, MAGNET FEM Software.

## TUITION FEE AND FINANCIAL ASSISTANCE

All full-time Ph.D. students admitted into the program shall receive a **doctoral award (teaching and research assistantship) consisting of tuition-fee waiver** (50% or 100% tuition waiver as per merit of the applicant, ([see fee structure and details here](#)) **AND monthly stipend of ₹40,000 per month for the first two years, and ₹45,000 per month for the next three years**, subject to benchmarked performance that is evaluated continuously. The continuation of the award is subject to satisfactory performance in the program, evaluated continuously, and compliance with all university regulations. **Support will be available for deserving Ph.D. students to disseminate their work through conferences and publications.** For this, a **Research Grant of INR 1,50,000 (One Lakh fifty thousand) is available for students to be used for conference** (only Scopus indexed) travel (domestic and/or international) during the 5-year period of Ph.D. program. The hostel fees and other financial regulation are mentioned in admission website. Candidate are advised to refer the same for further clarification.

## ONGOING Ph.D. STUDENT JOURNAL PUBLICATIONS

- G. N. Babu and **N. Chauhan**, "Dispersion Characteristics From Simplified Dispersion Equation for Open Rectangular Planar Tape Helix," in IEEE Transactions on Electron Devices, doi: 10.1109/TED.2024.3367308.
- **J. Pillai**, J. Prajapati and M. D. Upadhayay, "Efficiency enhancement of a circularly polarised Slotted Waveguide Antenna Array for Sub-THz applications", Optical and Quantum Electronics, 2024. DOI: 10.1007/s11082-024-06454-z
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- **J. Pillai**, M. D. Upadhayay, and J. Prajapati, "Radiated power and directivity analysis of a nano-dot photoconductive antenna," Optical and Quantum Electronics, vol. 55, no. 11, p. 1017, 2023.
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- Vinturaj V P, Ashish Kumar Yadav, Jasil T K, **Kiran G**, Rohit Singh, Amit Kumar Singh, Vivek Garg, and Sushil Kumar Pandey, "Theoretical investigation of electronic and optical properties of doped and defective MoSe<sub>2</sub> monolayers", Bulletin of Materials Science, vol. 46, p. 121, June 2023
- Ashish Kumar Yadav, Chandrabhan Patel, **Kiran G.**, Rohit Singh, Amit Kumar Singh, Vivek Garg, Shaibal Mukherjee, and Sushil Kumar Pandey, "Growth optimization and DFT investigation of doping effect on properties of VS<sub>2</sub> monolayer crystals", The European Physical Journal B, vol. 96, p. 49, April 2023
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- **Kiran G**, Sushil Kumar Pandey, Praveen Dwivedi, and Rohit Singh, "Device Optimization and Sensitivity Analysis of a Double-Cavity Graded MgZnO/ZnO MOSHEMT for Biomolecule Detection", *Physica Scripta*, (under review) (SCI indexed, IF: 3.08)
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- N. B. Gnanamoorthi, **N. Chauhan, P. Katiyar**, J. Prajapati and M. D. Upadhayay, "Simulation of Small Signal Characteristics of Open Planar Tape Helix Slow Wave Structure with Straight Edge Rectangular Connections," 2023 24th International Vacuum Electronics Conference (IVEC), Chengdu, China, 2023, pp. 1-2, doi: 10.1109/IVEC56627.2023.10157670.
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- S. M. Picardo, **J. B. Shaik**, N. Goel, and S. Singhal, "Integral impact of PVT variation with NBTI degradation on dynamic and static SRAM performance metrics" ,International Journal of Electronics, vol. 109, no. 2, pp. 293-316, Feb. 2022, doi: 10.1080/00207217.2021.1908628
- Sai Vasudeva Bhagavatula, Venkata Rupesh Bharadwaj Yellamraju, Karthik Chandra Eltem, P. N. Shashank, Phaneendra Babu Bobba, Satyanarayana Kosaraju & **Naveen Kumar Marati** (2022) Real-time monitoring of battery state of charge using artificial neural networks, International Journal of Ambient Energy, 43:1, 7182-7196, DOI:10.1080/01430750.2022.2049872.

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- **P. Mathur**, V. K. Chakka and S. B. Shah, "Ramanujan Periodic Subspace Based Epileptic EEG Signals Classification," in *IEEE Sensors Letters*, vol. 5, no. 7, pp. 1-4, July 2021.
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- **Vinay Sharma**, Ananya Goel, Madhur Deo Upadhyay, and Atul Vir Singh, "A Pi-Shaped Slot Antenna for 5.2 GHz WLAN MIMO Application," *IETE J. Res. (Taylor and Francis)*, pp. 1-13, Jan. 2021, doi:10.1080/03772063.2021.1873201. (SCI, Impact factor 1.125)
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## RESEARCH ACHIEVEMENTS

- Mr. Shaik Jani Babu
  - Best oral presentation in the session and awarded travel grant in iSES-2018 conference
  - Completed the physical design and verification internship program by Entuple Technologies Pvt. Ltd.

- Mr. Shaik Basheeruddin Shah
  - Recipient of Dean Faculty Postdoctoral Fellowship at Weizmann Institute of Science.
- Mr. Naveen Kumar Marathi
  - Filed an Industrial Patent
  - Edited a Springer book : AI Enabled IoT for Electrification and Connected Transportation
- Ms. Kajal Yadav
  - Best Paper award in 8th International Conference on Nanoelectronics, Circuits & Communication Systems(NCCS-2022).

## PLACEMENTS

Our Ph.D. graduates have been employed in prestigious industries and institutions. Here is the list:

S. No.	Name	Affiliations	Year of Graduation
1	Venugopal	UPES, Dehradun	2023
2	Goli Srikanth	Research Engineer, Dolcera, Hyderabad	2023
3	Jani Babu Shaik	ASIC Design Engineer, Cyient Semiconductors, Hyderabad	2022
4	Shailendra Singh	Deputy Manager, Shriram Industries Ltd	2021
5	Shaik Basheeruddin Shah	Postdoctoral Student at Weizmann Institute of Science, Israel	2021
6	Vinay Sharma	Post Silicon Validation Engineer, Intel Corporation, Bengaluru, India	2021
7	Manali Saini	Postdoctoral Research Fellow at Mayo Clinic Rochester, MN, USA	2021
8	Merugu Kavitha	Associate Professor & Head-Research and Product Development Division, QIS College of Engineering and Technology	2020
9	Richards Joe Stanislaus	Assistant Professor, Vellore Institute of Technology , India	2019
10	Naveen M	Sr. R & D Manager, Hitachi Energy, Switzerland	2018
11	Jyotirmoy Dutta	Senior Scientist, IUDX Program Unit, SID, IISc Bangalore.	2017

## HIGHER EDUCATION: (Top Institutions name where our scholars got enrolled for higher education)

- Dr. Shaik Basheeruddin Shah is the Postdoctoral Student at Weizmann Institute of Science, Israel
- Dr. Manali Saini, Postdoctoral Research Fellow at Mayo Clinic Rochester, MN, USA
- Dr. Naveen Kumar Marathi, Sr. R & D Manager, Hitachi Energy, Switzerland
- Dr. Richards Joe Stanislaus, Post Doctoral Fellow, CEERI

## ELIGIBILITY CRITERIA

Eligibility for Full-Time/Part-Time candidate:	
Qualifying Degree	Minimum performance in qualifying degree
M.Tech./M.E. or equivalent degree in Electronics & Communication/Electrical & Electronics/relevant discipline	60 % or 6.0 CGPA from a recognized technical institute or university.
M.Sc.* in Physics with specialization in electronics/solid state engineering, M.Sc. Electronics, M.Sc. Mathematics with specialization in signal processing/theory of computation.	70% or 7.0 CGPA from a recognized technical institute or university.
B.Tech./B.E.* in Electronics & Communication/ Electrical & Electronics/ relevant discipline.	75% or 7.5 CGPA from a recognized technical institute or university.

\*M. Sc./ B.Tech./ B.E. candidates with valid GATE/CSIR/UGC-NET/INSPIRE-fellowship will be preferred.

**Notes:**

(i) Applicants waiting for the qualifying examination results are also eligible to apply. However, those who are finally qualified must produce proof of minimum eligibility of marks or an equivalent grade point before taking the admission in the EED Ph.D. program.

(ii) Part Time Ph.D. applicant should be working in the relevant area (Industry/Academic/Research Institutions) for a minimum period of 2 years. Candidate is required to produce a No Objection Certificate from the employer at the time of admission.

(iii) External Examinations: A good score in GATE, CSIR, UGC NET- JRF is desirable, though not mandatory.

## SELECTION PROCESS

Selection Process
<ul style="list-style-type: none"><li>• Eligible candidates will be called for written test followed by an interview.</li><li>• Candidates with a valid GATE score of 95 percentile or higher will be exempted from the written test.</li><li>• Eligibility criteria mentioned above are the minimum and applications not meeting the same will be summarily rejected.</li><li>• The shortlisting will be done based on the academic qualification and statement of purpose.</li><li>• Final selection of the candidates will be done by Departmental Selection Committee after completing the process (written test and Interview). Eligibility criteria mentioned above are the minimum requirements. Applications not meeting the same will not be called for written test and interview.</li></ul>

## CONTACT DETAILS

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For further information visit our website [www.snu.edu.in](http://www.snu.edu.in)

More details about Doctoral admissions can be found at: <https://snu.edu.in/admissions/graduate-programs>

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