

SHIV NADAR

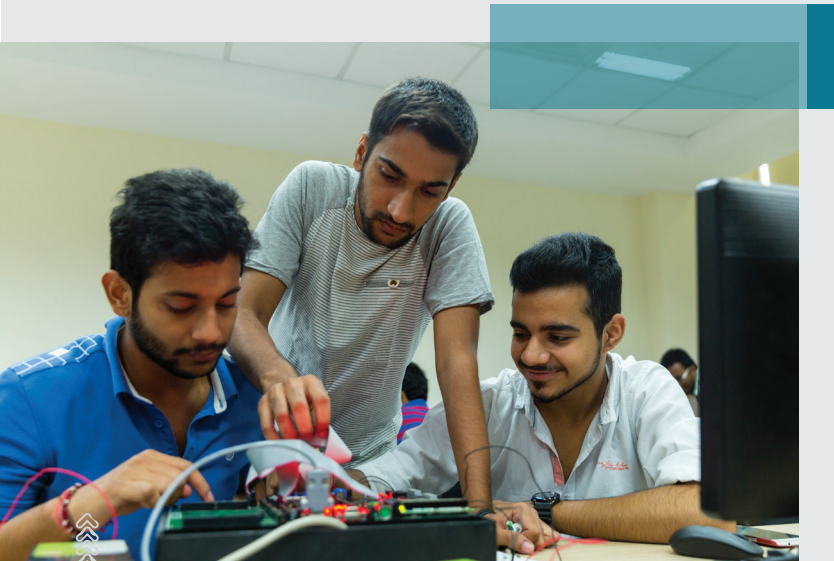
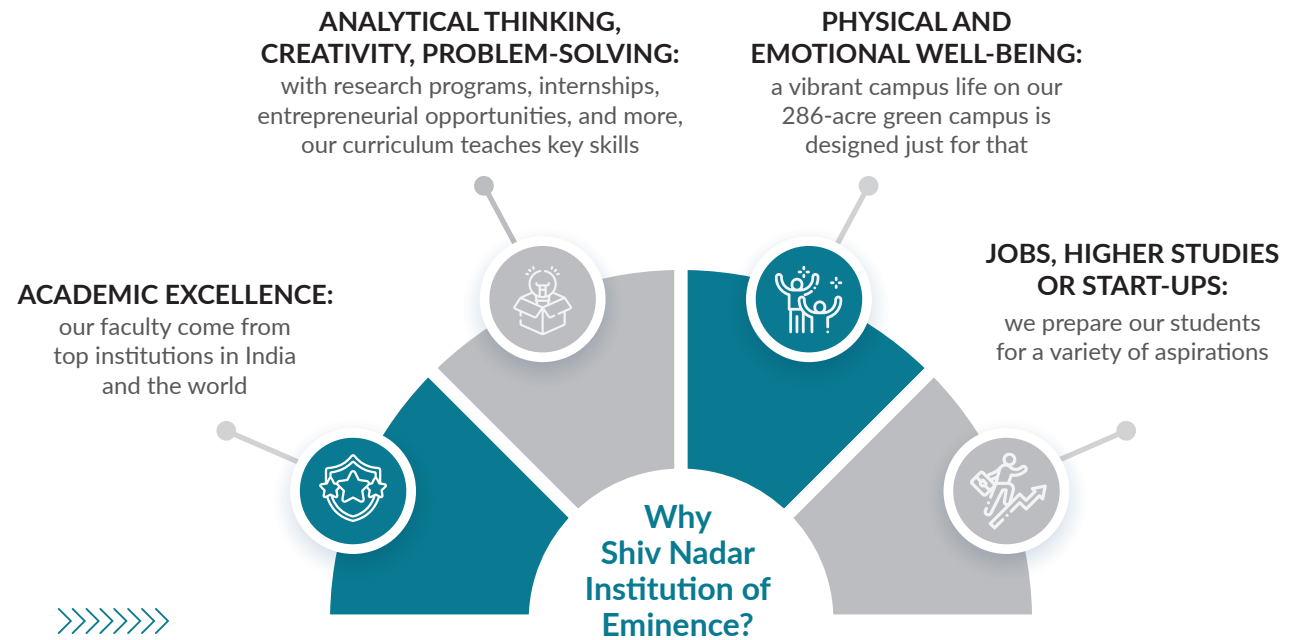
INSTITUTION OF EMINENCE DEEMED TO BE
UNIVERSITY
DELHI NCR

DEPARTMENT OF
**ELECTRICAL
ENGINEERING**



Why Shiv Nadar University?

Shiv Nadar University is a multidisciplinary research university established in 2011 by Mr. Shiv Nadar, one of Asia's foremost philanthropists and a pioneer of the technological revolution in India. The four Schools at the university offer undergraduate, postgraduate, and doctoral degrees in Engineering, Natural Sciences, Humanities and Social Sciences, and Management and Entrepreneurship. It is the youngest university recognised as an Institution of Eminence by the Government of India, a distinct category of higher education institutions that "strive to become the top hundred Institutions in the world over time". In the Government's National Institutional Ranking Framework (NIRF), the university has been the youngest institution in the 'Top 100' overall list for the last five years.



Why Study Electrical and Computer Engineering at Shiv Nadar University?

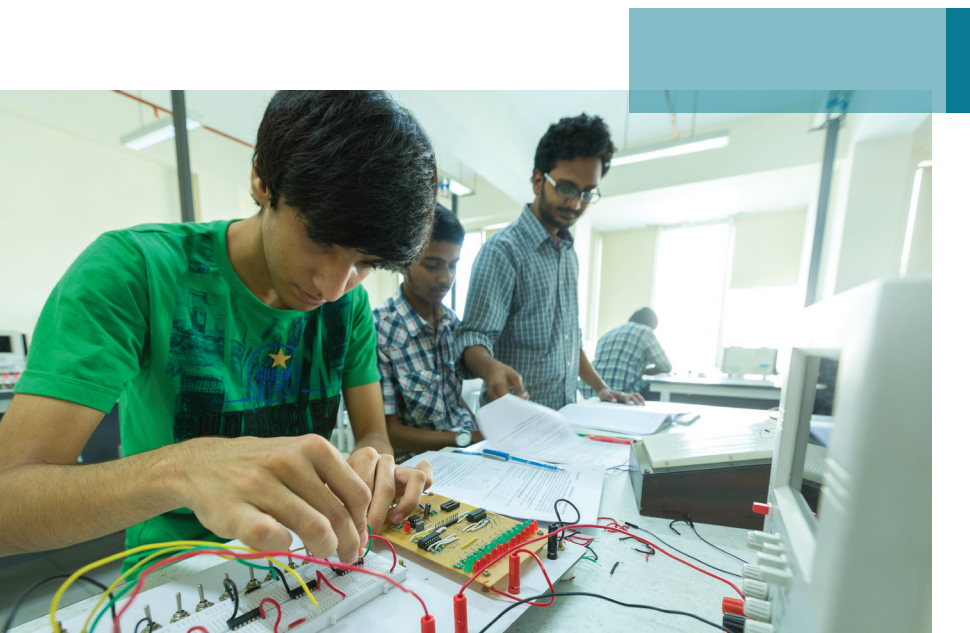
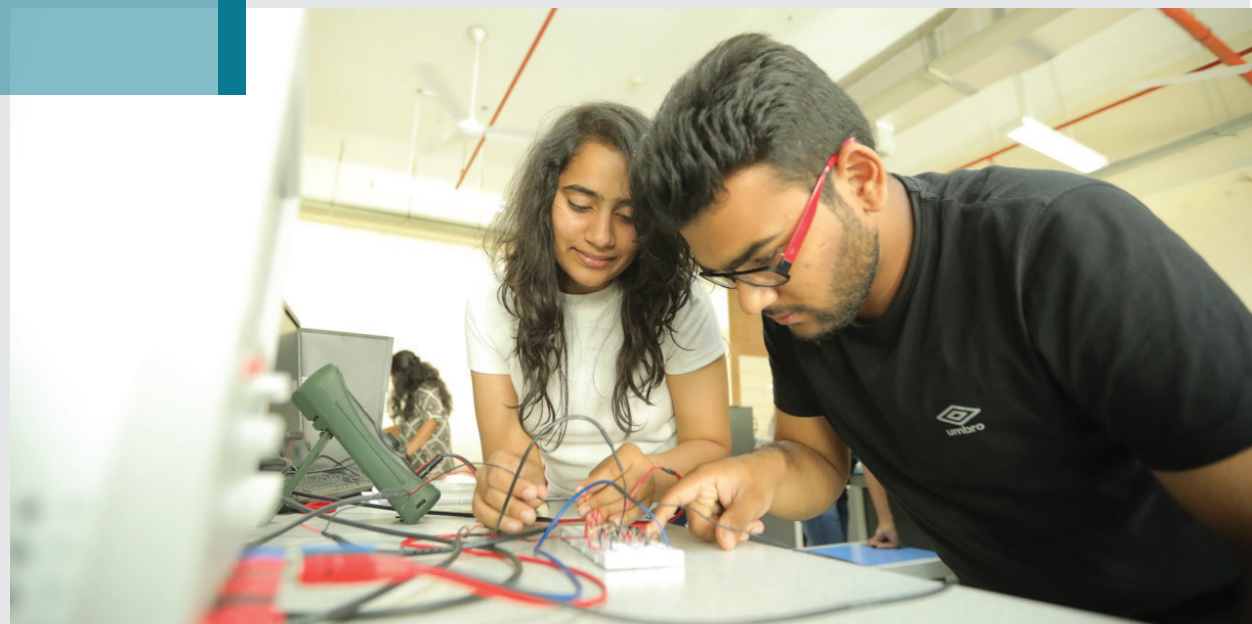
The Department of Electrical Engineering aims to prepare the students for the challenges in Electronics, Electrical, Communication and Computer Engineering areas in industry and academia through a well-structured curriculum. It offers undergraduate program in Electrical and Computer Engineering and Doctoral Programs. Currently, there is also an M.Tech Program in VLSI and Embedded Systems. The curriculum is divided into three categories: Mandatory core courses, which lay the foundations for any engineering discipline, elective courses and projects. Students are free to choose the electives based on their interests.

The program encourages students to participate in hands-on projects and has structured and well-equipped laboratories

to align the program with current industry trends and academic research. In addition, the students can optionally earn minors in other disciplines of the university. The faculty members are actively engaged in research with challenging problems, relevant to industry and academia. The department continuously upgrades its experimental and computational facilities. It engages in consultancy work, inter-departmental and industrial collaboration, and academic collaboration with universities in India and abroad. Faculty and students are encouraged to participate in national and international conferences, seminars and workshops. This provides them an opportunity to interact with professionals in their areas.

Curriculum

The core curriculum is revisited and revised regularly to meet current research and industry developments. Several new courses in computer engineering, communication engineering, and control systems have been introduced in the curriculum to align the students with the current industry requirements and trends worldwide. The courses offered include Electrical Machine Drives, Power Electronics, Analog and Digital VLSI Design, Computer Organization, Data Structure, Semiconductor Device Physics, Signal Processing, Wireless communication, Information Theory, Quantum Computing, Microwave Devices, Embedded & IoT systems, AI/ML applications, Control System, Introduction to Robotics etc.



B. Tech. (Electrical & Computer Engineering)	<ul style="list-style-type: none"> ▪ Curricula designed to allow students to have insight into the subject and the ability to relate theory to practice ▪ UG students are also encouraged to earn a minor degree in the areas of their interest along with a B. Tech.
M. Tech.	<ul style="list-style-type: none"> ▪ Master of Technology (M.Tech.) in VLSI Design and Embedded Systems
Ph.D. (Electrical Engineering)	<ul style="list-style-type: none"> ▪ Ph.D. students can apply twice in an academic year (Spring and Monsoon semesters). ▪ Selection based on minimum qualification as announced on the university website and performance in the Shiv Nadar IoE Ph.D. entrance examination. ▪ All successful full-time Ph.D. students are offered a tuition fee waiver and a generous monthly stipend to cover their living expenses.

State-of-the-art Laboratories

The Department has state-of-the-art laboratories with sophisticated instruments, software, and computational facilities. Domain expert faculty members handle each laboratory with the active participation of the laboratory technical staff. The department also encourages its Ph.D. students to participate in undergraduate laboratories as part of academic training.

UG Teaching Laboratories and Research Facilities

- Electrical Machine Lab
- Power Electronics Lab
- Project Lab
- Embedded Electronics Lab
- Communication Engineering Lab
- Digital Signal Processing Lab
- Microwave Lab
- Electronics Lab 1 & 2
- Measurement & Control Lab
- VLSI Lab
- Microcontroller Lab
- Energy Lab
- Organic and Flexible Electronics lab
- Nanoelectronics Computation Laboratory (NCL)



Electrical Engineering Faculty

The Department has qualified and experienced faculty in all the discipline domains. They are actively engaged in research with challenging problems relevant to industry and academia. As per the university policy, all the faculty hold doctoral degrees from reputed institutions within India and foreign universities. The department believes in inter-departmental faculty interaction and collaboration with industry and universities within and outside India. This helps in maintaining state-of-the-art infrastructure in teaching and research labs.

Department of Electrical Engineering Faculty

**DR. VINOD SHARMA**

Head of the Department and Professor, Ph.D., Carnegie Mellon University, USA
Research Interests: Communication Networks, Wireless Networks, Information Theory

**DR. GOVIND SHARMA**

Professor, Ph.D., University of Southern California, Los Angeles
Research Interests: Digital Communication, Wireless Communication, Digital Signal Processing, Statistical Signal Processing, Detection and Estimation Theory, Image and Video Signal Processing

**DR. DINKAR PRASAD**

Professor, Ph.D., IIT Kharagpur, India
Research Interests: Electrical Machines and Drives, Power Electronics

**DR. VIJAY KUMAR CHAKKA**

Professor, Ph.D., NIT-Trichy, India
Research Interests: Communication Engineering, Signal Processing, Deep learning on Graph neural networks

**DR. RAKESH BANSAL**

Professor, Ph.D., University of Connecticut, Storrs
Research Interests: Information Theory, Sequential Change Detection, Detection theory, Statistical Robustness

**DR. G NAVEEN BABU**

Associate Professor, Ph.D., IIIT-Noida, India
Research Interests: Electromagnetic Engineering, Microwave Tubes, Antennas, Metamaterial based electromagnetic structures, Machine learning, Deep learning

**DR. SONAL SINGHAL**

Associate Professor, Ph.D., IIT-Roorkee, India
Research Interests: Ageing-aware novel CMOS logic architectures, In-Memory computing architecture, spiking neural networks, and development of low-power sensor nodes for Internet-of-Things applications.

**DR. VENKATNARAYAN HARIHARAN**

Associate Professor, Ph.D., IIT-Bombay
Research Interests: Modelling of semiconductor devices and on-chip interconnects, CAD algorithms for VLSI, Mixed-signal VLSI design, Technology-circuit interactions

**DR. ATUL VIR SINGH**

Associate Professor, Ph.D., IIT-Delhi, India
Research Interests: MEMS Technology, Microelectronics, Semiconductor Materials and Devices

**DR. AMITABH CHATTERJEE**

Associate Professor, Ph.D., University of California, Santa Barbara, USA
Research Interests: Modelling and Simulation of Semiconductor Devices and Circuits, WBG Power Electronics, TCAD of Advanced Materials & Scaled Devices, VLSI - Power & Analog, Ultrafast Lasers & Electronics

**DR. MADHUR DEO UPADHAYAY**

Associate Professor, Ph.D., IIT-Delhi, India
Research Interests: Active and passive circuits for RF & Microwave, RFID, EMC/EMI, Antennas: Passive & Active Antenna, OAM Antenna, MIMO Antenna

**DR. KAMAL SINGH**

Assistant Professor, Ph.D., IIT-Bombay
Research Interests: Multi-antenna Communication systems for 5G/6G Wireless, Information-theoretic aspects of Wireless Communications

**DR. AMIT BAKSHI**

Associate Head & Associate Professor, Ph.D., IIT-Bombay
Research Interests: Short-circuit mechanical strength analysis of power transformers, Low-frequency electromagnetic analysis, Homotopy analysis method to solve nonlinear differential equations

**DR. HIMANSHU SEKHAR SAHU**

Assistant Professor, Ph.D., IIT-Guwahati
Research Interests: Integration of Renewable Sources with the Grid, Photovoltaic Power System, Distributed Generation and Power Quality, Renewable Energy

**DR. JITENDRA PRAJAPATI**

Assistant Professor, Ph.D., IIT-Guwahati

Research Interests: Terahertz Radiation, Terahertz Antennas, Photoconductive and Photomixing Antennas, Terahertz Applications, Terahertz Sensing, Microwave Devices and Antennas

**DR. UPENDRA KUMAR PANDEY**

Assistant Professor, Ph.D., University of Calabria, Italy

Research Interests: MEMS Technology, Microelectronics, Semiconductor Materials and Devices

**DR. ROHIT SINGH**

Assistant Professor, Ph.D., IIT-Indore

Research Interests: Nanoelectronics, Embedded Systems, Internet of Things

**DR. SANDEEP SONI**

Assistant Professor, Ph.D., IIT (BHU) Varanasi

Research Interests: Nonlinear Control Systems, Multiagent Systems, Control Applications to Robotics and Power Electronics

**DR. KAMAL AGARWAL**

Assistant Professor - Ph.D., IIT Delhi

Research Interests: Physical layer aspects of wireless communication for 5G and 6G, Wireless powered communication, Aerial communication, Underwater wireless optical communication, Next generation multiple access, Device to Device communication Reconfigurable Intelligent surface, Backscatter communication, Integrated sensing and communication.

**MR. AAKASH SINHA**

Assistant Professor of Practice, M.S., Carnegie Mellon University, USA

Research Interests: Robots, Drones, Driverless Cars, and Machine Learning

**DR. RAKESH PALISETTY**

Assistant Professor, Ph.D., IIT Patna

Research Interests: VLSI architectural design, Field-programmable gate array (FPGA)-based system design, VLSI for baseband wireless communication system, Digital Beamforming, ASIC Implementation

**DR. SUBHENDU BIKASH SANTRA**

Assistant Professor, Ph.D., Jadavpur University

Research Interests: DC-DC Converter Topologies for EV and PV applications, High power density converter, Microgrid Control, PMSM/BLDC Motor drive

OUR Program

The Opportunities for Undergraduate Research (OUR) program at Shiv Nadar University aims to give undergraduate students hands-on experience conducting research and doing independent work under faculty supervision. By participating in the OUR program, students are encouraged to satisfy their natural inquisitiveness and grow their expertise in research methodology. As a result, the students gain experience in research from their early days.

Some of the recent OUR projects include the following:

- Real-time Carrier Synchronization in PC-based SDR Systems
- Filtenna Design For 5G Communication
- RF Carrier Combiner For Satellite
- Reservoir computing models for Machine Learning
- Compact bandpass filters for 5G communication systems
- Non Fullerene Acceptor based Organic Solar Cells using PTB7 as donor
- Interface engineering at Hole Transport Layers and Perovskite layer for efficient and stable PSC
- Utilising a ternary blend of PM6 (Donor) and Y6 and CF3 as an acceptor material for Organic Solar Cells
- Self-assembled anti-Naphthalene bisbenzimidazoles based ETL for Perovskite Solar Cells
- Maximising power generation of partially shaded PV arrays using optimal configuration
- Tracking of global MPP of a partially shaded PV array using voltage and current perturbation
- Generation of a 50V high frequency (100 kHz) square wave from 230V mains supply
- Thyristor-based starter for separately excited dc motor
- Design of Reliability-Aware CMOS-based synaptic circuits
- Design, Implementation and Aging analysis of i-SRAM: In-Memory Computing Architecture
- Developing Physical Design of I2C Controller
- RIS-Assisted D2D Communication with Transceiver Hardware Impairments
- Designing of Low Power Arduino-Based Sensor Node
- Design of an Embedded Edge-processing Water Quality Monitoring System
- IoT Enabled FreeRTOS Based Air Quality Monitoring System
- Constant-Current Constant-Voltage Charging System with a Two-Switch Forward Converter



Pathway to Progress

Our undergraduate and postgraduate degrees have enabled our students to enter successful careers. Electrical Engineering professionals can find employment in the public sector (DRDO, HAL, NTPC, BHEL etc.) and private companies (HP, Oracle, Cognizant, HCL, Tata Powers, Silicon labs etc.)

Entrepreneurial students can develop new hardware and software products through their start-ups. The Atal Incubation Center at the university encourages such activities.

Many of our students have pursued Master's and Ph.D. degrees in global universities upon completing their B.Tech studies. By acquiring degrees from prestigious institutions in India and abroad, our students are assuredly on the pathway to progress.

Student Outcomes

Over the years, the department has attracted a talented cohort of undergraduate and graduate students. Many of our graduated students obtained admission and fellowships for Masters, Ph.D. and Post-Doctoral Fellowship in reputed universities/organisations around the globe like Weizmann Institute of Science, Mayo Clinic Rochester. Many of our bachelor students also obtained job offers from industrial giants such as McKinsey, CommVault, HP Inc, Dell & Cognizant/IRDETO/Byju's, Champions Semiconductors/Lutron Electronics/Encore Capital/L&T Tech.





Admissions Eligibility

Bachelor of Technology

Program	Selection Criteria	Class 12 th Eligibility
Electrical and Computer Engineering	Route 1 - JEE Mains 2024/ 2023	Aggregate of Physics, Chemistry and Maths must be $\geq 65\%$
	Route 2 - SNUSAT Score + APT	
	Route 3 - CUET 2024 Score + Interview	
	Route 4 - Valid College Board SAT Score + Interview	
	Route 5 - Valid ACT Score + Interview	

Scan Here For More Details:



Contact Details

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