Sardar Patel University

Launches a Master's Program

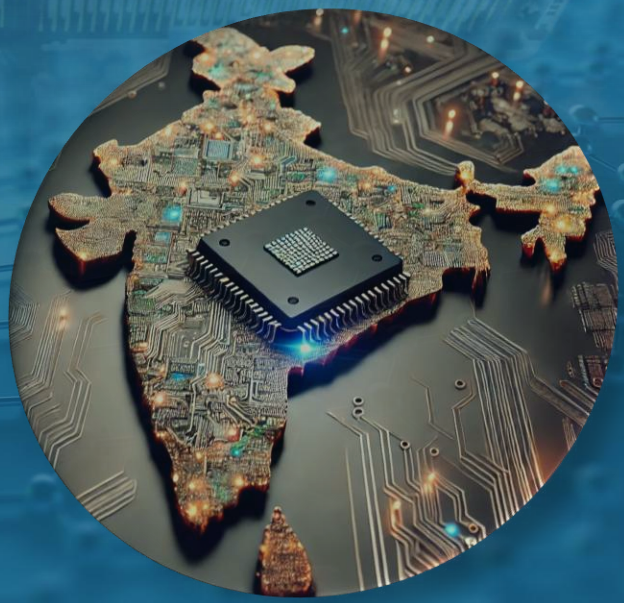
on

Semiconductor Science and Technology

"Shaping India's Future in Semiconductor Technology"

Patron

Prof. Dr. Niranjan P. Patel
Hon'ble Vice Chancellor
Sardar Patel University



About the Course

❑ India's Semiconductor Mission

- Under the visionary leadership of Hon'ble Prime Minister Shri Narendra Modiji and Hon'ble Minister Shri Ashwini Vaishnawji, India is emerging as a semiconductor powerhouse. With initiatives like India Semiconductor Mission-ISM and Indian Design, Semiconductor, Packaging and Systems-IDSPS, India is addressing the manufacturing gap, making way for world-class design, semiconductor, packaging, and systems integration.

❑ Course Vision

- The M.Sc. in Semiconductor Science and Technology at SPU is tailored to produce highly skilled professionals for the semiconductor industry. It combines strong fundamentals in physics, material's science, chemistry, and engineering.

❑ Why This Course?

- India is positioning itself as global hub for semiconductor manufacturing.
- Aligns with ambitious national vision i.e. Atmanirbhar Bharat, Vikshit Bharat-2047, India Semiconductor Mission-ISM and Indian Design, Semiconductors, Packaging and Systems-IDSPS for enhancing the role in domestic and global semiconductor supply chain.
- Industry-focused curriculum.
- Prepares for Fab and OSAT job markets.
- Access to the world-class facilities.

"Explore the thriving opportunities in Semiconductor Ecosystem"

Growing Semiconductor Industry

The global semiconductor market will reach $1 trillion by 2030. India is investing heavily in semiconductor manufacturing (Production Linked Incentive Schemes, India Semiconductor Mission-ISM, Indian Design, Semiconductors, Packaging and Systems-IDSPS). Increasing demand for semiconductors in AI, IoT, 6G, automotive industries, Solar and Wind Energy, Biomedical, Defense and Drone technology, Space Industry etc. will generate tremendous opportunities in the coming time.

Career Opportunities

Diverse Career Opportunities: Direct jobs in the fields mentioned above by skills gained in semiconductor material and device manufacturing, VLSI design, nanotechnology, and optoelectronics, device and systems packaging and reliability. **Research Prospects**: Universities, Private sector/ Government R&D labs, and startups.

Advanced Curriculum and Research Focus

Specialized Course: Semiconductor Physics, Nanoelectronics, Optoelectronics, MEMS, NEMS, Quantum Materials. Hands-On Training: Fabrication, Characterization, and Simulation. Interdisciplinary Learning: Electronics, Physics, and Materials Science.

"Explore the thriving opportunities in Semiconductor Ecosystem"

Government and Industry Initiatives

National initiatives like Make in India, Atmanirbhar Bharat, Vikshit Bharat by 2047 and the PLI Scheme to establish a sustaining semiconductor ecosystem in India. Collaboration with industries, research centers, and academia for internships and projects.

Industrial Internship Opportunity

In the final semester, students will have the opportunity to gain industry/institute exposure through internship at leading semiconductor companies and research institutions.

Why at Sardar Patel University?

Experienced Faculty and Research Excellence

- Expert faculties in semiconductor materials, device physics, nanotechnology, and optoelectronics with more than 25 years of teaching experience. Faculty members with international collaborations and publications with high citation index.
- Faculty at SPU developed first of its kind semiconductor facility in the state university of Gujarat to test semiconductor material and devices at 4 K.
- First to develop 2D TMC materials for Photodetection, Breath, Speech, Pressure and Temperature sensing applications in Gujarat.

Well-Equipped Laboratories

- Crystal Growth, Thin-film deposition, and semiconductor device fabrication labs. Advanced tools like XRD, Czochralski, Bridgman, Vacuum Coating Unit, Keithley 4200-SCS, Keithley 2700-DAQ, Keithley 2400-SMU, Raman Spectroscopy, Hall Effect measurements. Computational resources for SCAPS-1D, Verilog, Python, LabView and MATLAB simulations.

Strong Industry and Academic Collaborations

- Collaborations with semiconductor industry, research labs, universities, and MoU with IIT Bombay. Internship opportunities at IIT-Bombay, SAC-ISRO Ahmedabad and in leading semiconductor firms.

Why at Sardar Patel University?

Interdisciplinary and Application-Oriented Learning

- Curriculum designed in consultation with industry, academia and integrated with hands-on training, live projects, internship and industrial exposure. Focus on emerging areas like 2D Materials for next generation semiconductor devices, AI hardware, photonics, flexible electronics, sustainable semiconductors and packaging.

Research Funding and Project Grants

- Completed many projects under UGC, DST, CSIR, DRDO and other national schemes. Opportunities for students to work on government and industry-sponsored research.

This M.Sc. program aims to bridge the gap between academia and industry, equipping students with the skills and knowledge required for a successful career in the semiconductor sector.

Join us and be a part of the next revolution in semiconductor technology!

State-of-the-Art Facilities @SPU

Sophisticated Instruments Available:

1. Semiconductor Characterization System

Make: Tektronix

Model: Keithley 4200-SCS Parameter Analyzer

2. Vacuum Coating Unit

Make: HIND HIVAC

Model: 12A4D

3. MicroRaman Spectrometer

Make: Horiba

Model: XploRA PLUS

State-of-the-Art Facilities @SPU

4. Hall-Effect Measurement System

Make: Lake Shore

Model: HMS 7504

5. X-Ray Diffractometer

Make: Rigaku

Model: Ultima IV

6. 4K Cryocooler System

Make: CTI-Cryogenics

Model: CCS-350T

State-of-the-Art Facilities @SPU

7. UV-visible Spectrophotometer

Make: JASCO

Model: V-730

8. Dual Zone High-Temperature Furnace for Crystal Growth

9. Bridgman Crystal Growth Set-Up

10. Czochralski Crystal Growth Set-Up

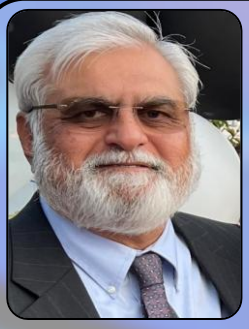
11. Atomic Force Microscope

12. Pulse Laser Deposition System

13. Holography Setup

14. Scanning Electron Microscope

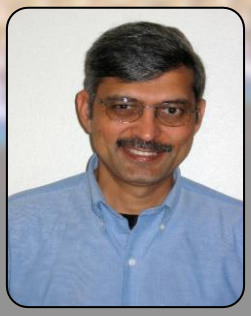
Experts Views



"S. P. University in Vallabh Vidyanagar is initiating a post graduate course in Semiconductor Science and Technology. The curriculum offers fundamental understanding of semiconductor manufacturing technology enabling students to contribute towards the success of Make in India initiative launched by GoI. Skill development is an integral component of semiconductor manufacturing operations. I congratulate the faculty members & administration at S. P. University to launch such a program and hope to see more industry participation in making this program successful."

- Sunil Patel, Semiconductor Packaging Technologist, USA

"The course that SPU is offering is very appropriate for the semiconductor push that is happening in Gujarat. Semiconductor industry is going to need thousands of jobs where technical skills in semiconductor engineering with the fundamental understanding in underlying science, mainly physics and chemistry would be mandatory. This course offers in-depth understanding of such technical details."



- Samir Patel, Guest Professor, IITGN, ex-Sankalp CEO, ex-Rambus VP and GM.

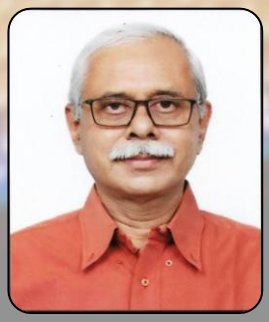
"A course in Semiconductor Science and Technology provides students with a deep understanding of the materials, physics, and processes behind modern electronic devices. It bridges theory and practical application, covering topics like semiconductor fabrication, device physics, and nanotechnology. Students gain valuable insights into how transistors, diodes, and integrated circuits work, preparing them for advanced roles in research, development, and the rapidly growing semiconductor industry."

- Paresh Patel, President & CEO, System Level Solutions, Inc. INDIA

Experts Views

"This course is specifically designed to enhance the semiconductor manufacturing and assembly related skillset and provides the necessary knowledge required to enter into the semiconductor ecosystem. This course has a capacity to make students ready for the demanding Fab and OSAT job market of India."

- Harshwardhan Patel, Global Foundry, New York, USA



"In the current scenario, the Semiconductor device manufacturing will be a major activity which will require motivated and knowledgeable manpower. This course aims to prepare human resources as needed in this sector."

- Dr. S. P. Bhatnagar, Retired Professor and Ex-HoD, Department of Physics, Maharaja Krishnakumarsinhji Bhavnagar University.

"With its industry focused curriculum, this M.Sc. course provides a solid foundation to its students, for a successful career in the semiconductor industry. The right mix of device physics, device fabrication, advanced packaging and reliability concepts, in this course, opens up numerous avenues for its students, in the exciting multi-disciplinary field of semiconductors".

- Santanu Sinha, Head of Division, RF Devices and Package Development Division, MEDG, ESSA, Space Applications Centre, ISRO, Ahmedabad.

Experts Views

"My best wishes to you and your team for enabling this platform, which will help students grasp basic concepts and build skills to achieve India's Semiconductor Mission goals. In the near future, students skilled in Semiconductor Science and Technology will push the boundaries of what is believed to be possible, realizing Atma Nirbhar Bharat in this frontier."

- Malkeshkumar Patel, Principal Researcher, Incheon National University, South Korea

"Technology breakthroughs and large investments are driving the semiconductor processing industry's notable expansion in India and around the world. Through programs like the 'Make in India' initiative and the Production-Linked Incentive (PLI) scheme, India is establishing itself as a global center for semiconductor manufacturing. A degree in semiconductor science and technology would be the right choice to contribute to this significantly growing industry. Best wishes to all who choose to delve into the world of semiconductor science and technology; you're stepping into a field that powers the future!"

- Jolly Joy, Engineer, Analog Devices, Gandhinagar, Gujarat and Department of Physics, SPU-Alumni

"Career prospects in the semiconductor wafer processing sector are bright, particularly in developing nations like India. The industry is expected to grow significantly with government support and large investments. To meet the growing demand for skilled professionals, it will be crucial to close the current skills gap through programs like SPU's Masters in Semiconductor Science and Technology. Best wishes for selecting a route that results in excellence and innovation! "

- Salil Nair, Engineer, Analog Devices, Gandhinagar, Gujarat and Department of Physics, SPU-Alumni

Career Prospects

❑ Booming Industry Opportunities:

- Wafer Processing Engineer
- Device Fabrication Engineer
- Packaging Specialist
- System Integration Expert

❑ Why Now?

- Expanding domestic and global needs for EVs, Defense, Drone, 6G and IoT
- Massive government investments (PLI scheme, Make in India)
- Growing demand for semiconductor professionals
- Opportunity to work with leading global companies

"A degree in Semiconductor Science and Technology opens the door to a future that powers the world."

Admission & Contact

❑ Eligibility Criteria

- B.Sc. / B.S. with physics, applied physics, electronics, material science and instrumentation.
- B.Tech. / B.E. in Electronics, Electronics and Communication, Electrical and Instrumentation Engineering.

❑ Fees and Scholarships

- Fees: 15,000/- per Semester
- Scholarships available from Sanskruti Group of Company, Gujarat, India.

❑ For Admission and Queries:

- Website: **https://www.spuvvn.edu/**
- Email: **coordinator-sst@spuvvn.edu**
- Phone: (+91) 94284 91216
- Intake : 20 students

"Your exciting semiconductor journey starts here"

Venue: Semiconductor Science and Technology,
Department of Physics,
Sardar Patel University,
Vallabh Vidyanagar-388 120.