

M.Sc. Physics

Department of Physics, School of Technology

Specialization:

- Advanced Condensed Matter Physics
- Advanced Electronics
- Advanced Fabrication and Experimental Techniques
- Atmospheric Physics and Oceanography
- Renewable Energy Resources

MISSION

Department of Physics in the School of Technology offers well-designed program curricula to provide in-depth knowledge in the basics of Physics and its applications and inculcates scientific temper in students interested in the Engineering and Technology.

In order to contribute and to provide assistance to PDEU to achieve its mission of academic excellence, the program integrates a judiciously-designed comprehensive curriculum and a research module for a sound academic, professional, and personal development of students.

VISION:

“The Department has a vision to graduate admitted students as life-long learners and accomplished researchers in Physics.”

- To create and maintain the programs of excellence in the areas of research, education and public outreach.
- To promote, inspire and nurture the fundamentals of Physics through M.Sc. courses offered for the basic sciences students.
- To offer research projects with high emphasis on concept-theory-practical training to build up research interest for the transformation of budding Physicists into productive scientists, excellent teachers, entrepreneurs and innovative independent researchers.
- Our specific goal is to become a nationally recognised department of Physical sciences for modern education with a state of art research facility.
- To aspire for excellence in Physical education and research.
- To prepares students for a diverse and changing world.
- Contribute to a literate society through teaching Physics (with classrooms, labs, and research) and service.
- Strong cross-disciplinary collaborations both within and outside the university.
- The Department of Physics aims to be recognised in (1) student success in the Physical sciences, (2) research contributions and impact, and (3) disciplinary engagement. This will be accomplished by leveraging our strengths, urban location, and student, faculty, and staff capabilities.

Philosophy of the program

The Department pursues the following primary objectives:

- Create an academic environment which promotes the intellectual and professional development of students and faculty.
- Develop and maintain a commitment to scholarly activities in research and education which is commensurate with the goals and mission of PDEU.
- Train M.Sc. students in the theoretical and practical skills required for employment or admission to higher education.
- The training of M.Sc. Physics Students in the theory of Physics, the ability to conduct independent research, the clear expression of scientific ideas, and the teaching of Physics.
- Provide programs for all students which meet the educational and technical demands of the sub-disciplines represented in the Department.
- Offer courses in cognate academic disciplines and professional fields which provide the necessary base for the career goals of students and faculty.
- Provide the public with service commensurate with a University.
- Implicit in these objectives is our responsibility as teachers, which includes but is not limited to, educating students and providing continuing education while promoting and clarifying the role and philosophy of education.
- A strong commitment to research means creating and maintaining a rigorous intellectual environment and achieving our broader commitments to the advancement of knowledge and service to the public.

Eligibility Criteria

B.Sc. / B.Sc.(Hons) with Physics /Applied Physics as a major subject or equivalent degree in offered specialization with minimum 50% marks aggregate of all semester/years or CPI 5.5 on 10 point scale or equivalent score from a recognized university/institute.

Strength

- Curriculum based on NET, GATE, JEST.
- Project Based Learning
- Student Research Projects funded by University
- Internship in Start-up Projects
- International Exposure Programme
- Highly qualified team of faculty members graduated from IITs, PRL etc. and with postdoctoral experience abroad (Humboldt-Germany, Fulbright-USA & JSPS-Japan)

Faculties: Department of Physics

Dr. Bhartkumar B. Parekh
Associate Professor, Ph.D. Saurashtra University

Research Interest:

1. Nonlinear Optical Material (Energy conversion materials)
2. ZnO Transparent conducting Oxide (TCO) (Solar Cell)



Dr. Manoj Kumar
Associate Professor, Ph.D. IIT Delhi

Research Interests:

1. Thermoelectric Materials
2. Thin Film Transistor
3. Hybrid Electronic Materials and Devices



Dr. Rohit Srivastava
Associate Professor. Ph.D. PRL

Research Interest:

1. Global warming and climate change
2. Cloud microphysics
3. Remote sensing and modelling of Ocean and Atmosphere
4. Ocean surface water processes



Dr. Satyam M. Shinde
Associate Professor, Ph.D., M. S. Uni. Of Baroda

Research Interests:

1. Computational Material Science
2. Thermoelectric Materials
3. Density Functional theory
4. Half/full Heusler compounds
5. Organic compounds for drug delivery, bio-sensor applications



Faculties: Department of Physics

Dr. Balamurali Krishna Mayya K.
Assistant Professor, Ph.D. PRL, Ahmedabad

Research Interests:

- 1.Modelling and Simulation of nanoscale devices
- 2.Statistical Physics
- 3.Plasma Science and Tokamak



Dr. Brijesh Tripathi
Associate Professor. Ph.D. PDEU

Research Interests:

- 1.Electronic Device Modelling and Simulation
- 2.Quantum Dot/Well Solar Cells
- 3.Thin Films for Opto-electronic Processes



Dr. Prahlad K. Baruah
Assistant Professor, Ph.D. IIT Guwahati

Research Interests:

- 1.Laser-matter interaction
- 2.Synthesis of Plasmonic nanoparticles
- 3.Laser-induced cavitation and shockwave dynamics
- 4.Surface enhanced Raman scattering (SERS)



Faculties: Department of Physics

Dr. Ankur Solanki

Assistant Professor, M.Tech. (IITK), Ph.D. & Postdoc (NTU, Singapore)

Research Interest:

1. Flexible Electronics
2. Organic/inorganic optoelectronic devices
3. Hybrid memory and synaptic devices
4. Nano-materials and photo-physics



Dr. Anup V. Sanchela

Assistant Professor, Ph.D. IIT Bombay, Postdoc Hokkaido Uni. Japan

Research Interest:

1. Thermoelectric materials
2. Transparent conducting oxide
3. Thin film transistor
4. Functional Materials and Devices



Dr. Sheetal Rawat

Assistant Professor, Ph.D. IIT Roorkee

Research Interest:

1. Experimental Nuclear Physics
2. Single crystal growth for Radiation detection



Mr. Abhishek A. Gor

Assistant Professor

Research Interests:

1. Magnetic properties and materials (Ferrites, Hexaferrites and its thin films)
2. Ferroelectrics and Multiferroics
3. Green Synthesis of Hexaferrites.



Our Strength (Laboratory)

1. Physics Laboratory:

Function generator, Michelson interferometer, Newton's ring, Thermal expansion of liquid setup, Thermal conductivity experiment, Solar collector, Measuring vapor pressure, Thermal expansion of solids, Reflections of Ultrasonic Waves, Heat Capacities Experiments, Critical Temperature Experiments, Hot Air Engine Quantitative Experiments, Heat Pump Experiment setup, Viscosity Experiment setup, Planck's Constant & Inverse Square law kit, He-Ne Laser, Hall Effect Experiment kit, Four-Probe Method Kit, Gauss Meter, Forced Oscillator Resonance Setup, Dielectric Constant kit, Bio Saver's law apparatus, Kerr Effect Experiment kit, Optical Fiber Kit, Photo Conductivity Kit, Ultrasonic Interferometer, E / M By Thomson Method, Polarization Of Light Using LASER, Millikan's Oil Drop Method, Holography And Interferometer.

Our Strength (Laboratory)

2. Materials Characterization Laboratory:

Infrared spectroscopy, Atomic Absorption Spectroscopy, Gas Chromatography, Gas Chromatography-Mass Spectrometry, High Performance Liquid Chromatography, X-ray Diffraction analyzer, Scanning Electron Microscopy, BET surface analyzer, Thermo gravimetric analyzer, Keithly 2450 power source, micro-positioner, fumehood, weighing balance, blade coater for thin-film coating, hot air oven, ultrasonic bath.

Research facilities



Laboratory



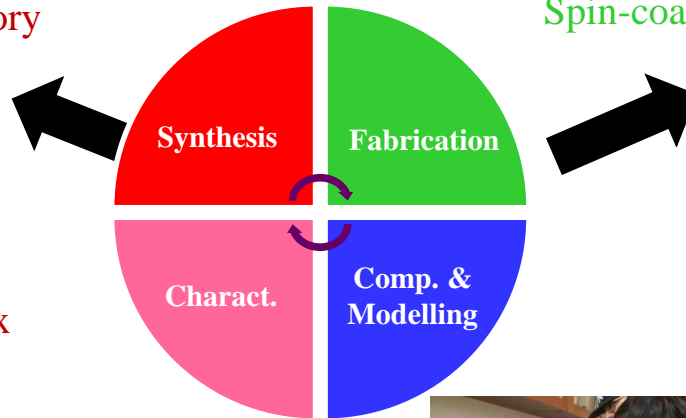
Spin-coater



Electrospinning



Glovebox



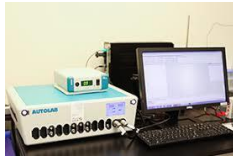
Sputtering and thermal



Research facilities



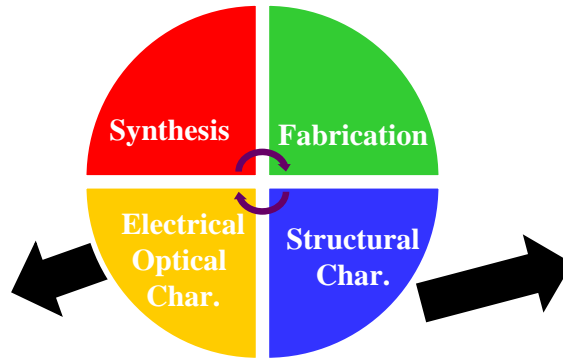
Solar Simulator



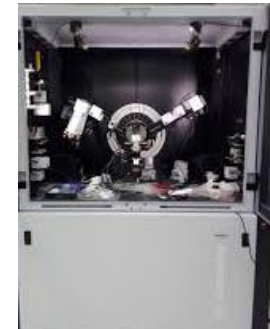
Auto-lab



UV-Vis Spectroscopy



FESEM

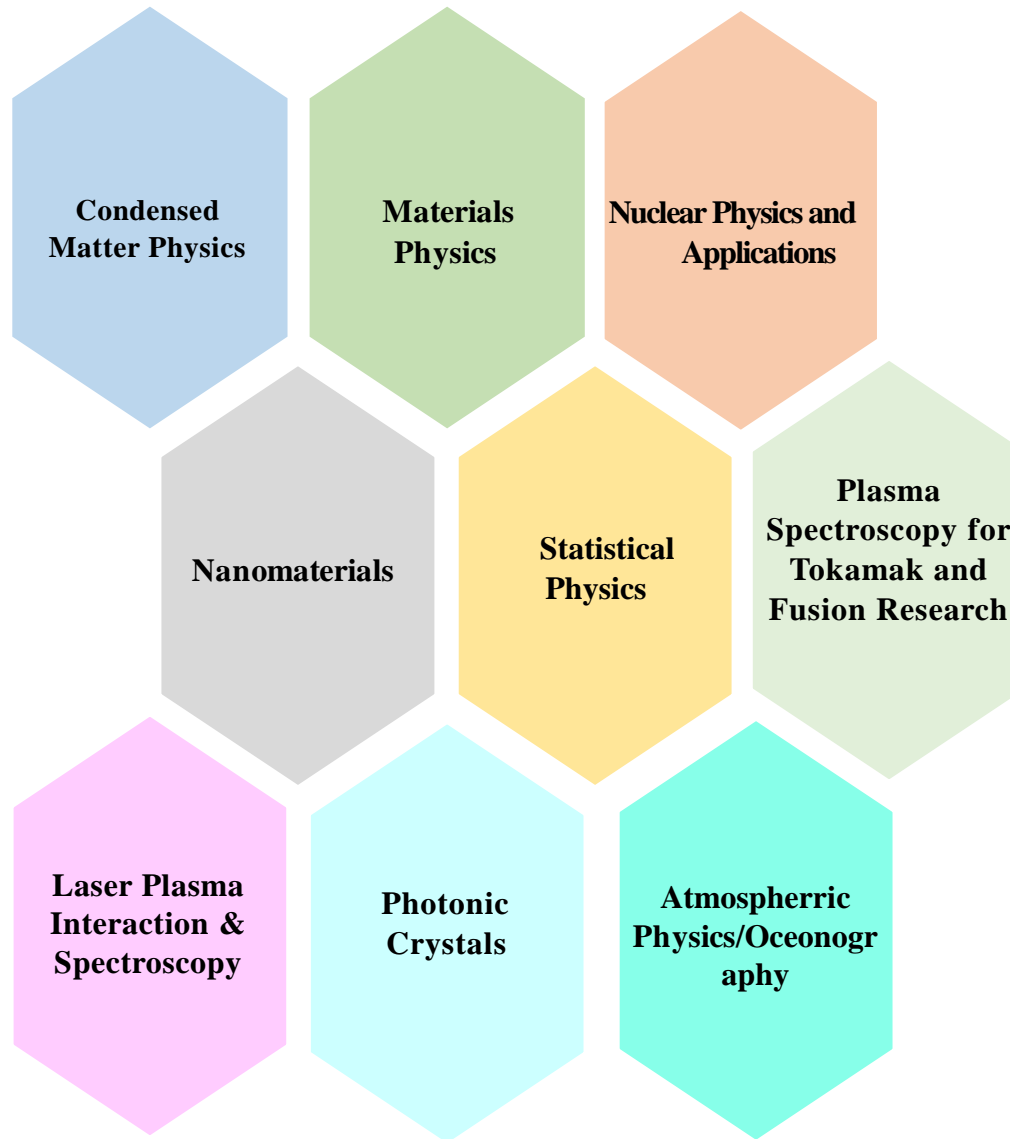


XRD

Department offers:

- Curriculum designed based on current and futuristic industry-academia demand
- Industry oriented specialization in Condensed Matter, Advanced Electronics, Renewable Energy etc.
- Credit based stream elective concept to allow the student have in depth understanding
- Exposure to applied research at early stage of the program
- Scholarships to students
- More than 50 % of lab and research work to train them for future projects in academic research.
- Industry collaboration and internships

Areas of research



Courses offered

Core Course

- Classical Mechanics
- Mathematical Physics
- Solid State Physics
- Numerical Methods & Computer Programming
- Thermodynamics & Statistical Mechanics
- Atomic & Molecular Physics
- Quantum Mechanics
- Nuclear & Particle Physics
- Classical Electrodynamics & Basic Plasma Physics
- Basic electronics and Instrumentation
- Laser Physics & Spectroscopy
- Research Methodology

Core Courses

Stream Elective course

- Advanced condensed matter theory
- Computational Techniques for Solid State Physicist
- Characterization Techniques
- Advanced Condensed matter Physics Laboratory

Advanced Condensed Matter

- Basic Communication Systems
- Organic Electronics
- Semiconductor Physics and Devices
- Advanced Electronics Laboratory

Advanced Electronics

- Paints, pigments & cosmetics
- Polymer Physics & Composite Materials
- Materials and Nano Physics
- Fine Physicals (PetroPhysicals, oil, soap and pesticides)
- Petroleum Physics & Catalysis

Renewable Energy Resources

- Fundamentals of Ocean Sciences
- Instrumentation and modelling of Oceans and Atmosphere
- Physics and dynamics of the atmosphere
- Atmospheric Physics & Oceanography Laboratory

Atmos. Phy. & Ocean.

Lab Course

- Solid State Physics Laboratory
- Computer Programming Lab
- Electronics Laboratory
- Nuclear and Particle Physics Laboratory
- Stream Elective Lab

Lab Course

Project

Research Project & Internship

Contact Us

Department of Physics

School of Technology

Pandit Deendayal Energy University,

Raisan, Gandhinagar - 382007

Gujarat, India

Phone Number: +91 79 23275438

Fax Number: +91 79 23275030

Email: satyam.shinde@sot.pdpu.ac.in