

# **Bajaj College of Science, Wardha**

## **Departmental Profile: Physics**

### **About the Department:**

The department of Physics was established in 1962 which is now one of the best well-equipped center for undergraduate studies in this central part of India. The department aims to stimulate an interest in the social and economic implications of Physics in society. It has three separate laboratories including a dark room with more than 100 experimental set ups. Every year it caters around 300 undergraduate students for regular curricular and co-curricular activities.

### **Highlights of the Department:**

- Well-equipped spacious laboratories with more than 100 experimental set ups, computers
- Blended mode of learning through offline and online virtual classrooms and LMS
- *Astro Club* for sky lovers
- Recognized center for National Graduate Physics Examination (NGPE)
- Guidance center for active participation in various intercollegiate competitions
- Linkage for student Internship programme with recognized national research institutes
- Undergraduate research facilities
- Certificate course in Nanoscience and Nanotechnology (Nanosense)
- Guest lectures and popular talks by eminent personalities of the subject

### **Sophisticated Major Instruments:**

- X-ray diffractometer (XRD) set-up
- G.M. Counter
- Digital Ultrasonic Pulse Echo Velocity Meter
- Hall Effect Measurement set up
- Magnetic Susceptibility apparatus
- Four probe Apparatus
- Dielectric Constant and Curie Temperature apparatus
- Fabry-Perrot Interferometer
- Digital polarimeter
- B-H loop tracer
- Specific charge measurement units

## Teaching Staffs:

| Name               | Qualification           | Designation                | Specialization             | Area of Research   |
|--------------------|-------------------------|----------------------------|----------------------------|--|
| Prof. R.G. Jadhao  | M.Sc.                   | Associate Professor        | Electronics & Spectroscopy | Experimental Physics   |
| *Dr. S.H. Bagade   | M.Sc., Ph.D., SET       | Associate Professor & Head | Digital Electronics & SSP  | Theoretical Physics  |
| Dr. G.V. Lakhotiya | M.Sc., SET, GATE, Ph.D. | Assistant Professor        | Nanomaterials              | Nanomaterials for optoelectronic Applications, Physics Education |
| Dr. S. R. Tiple    | M.Sc., Ph.D.            | Assistant Professor        | Material Science           | Fuel Cells   |
| Dr. M.M. Yerpude   | M.Sc., Ph.D.            | Assistant Professor        | Material Science           | Luminescence   |

\*Recognized PhD Guide of RTM Nagpur University

## Students' Participation and achievements:

- National Graduate Physics Exam (NGPE)
- Rank holders in University (RTMNU)
- Guidance for Joint Admission test for Masters (Physics)
- Internships at National Institutes viz. IIA (Bangalore), C-MET (Pune), University of Pune
- Participation in National conferences, seminars
- Participation in spoken tutorial of IIT Bombay
- Participation in State level/National Students' seminar/project competition
- Educational Tours
- Mini-Projects and learning units

## **Co-curricular programs of the department:**

- **Physics Counseling Center:**

Under this center, students get the information regarding the recent developments in the world of Physics. Students get the information of the career opportunities in Physics through this cell.

Faculty Incharge: Prof. R.G. Jadhao

- **Experiment Fabrication Center:**

Under this unit, students are entertained to design the new experiments for the curriculum. Students are facilitated all the requirements for the fabrication and designing of the experiments. This center organizes some skill-oriented workshops viz. *todu-jodu* workshop in which students used to utilize the parts of old faulty instruments to fabricate new.

Faculty Incharge: Dr. S. H. Bagade & Dr. M.M. Yerpude

- **Center for Physics Entrance Exam for Higher Studies:**

The department conducts weekly extra classes for the preparation of Physics entrance exam for the higher studies viz. JAM (Physics) etc. for advanced learners for free of cost. This programme was started since June 2014 and so many students get benefited from this programme.

Faculty Incharge: Dr. G.V. Lakhotiya

- **Astro Club:**

The Astro Club is an interdisciplinary hobby club started in 2017. It takes care of sky observations, regular events from the world of astronomy. It has a separate students' cell that used to conduct regular seminars, workshops, guest lecturers etc. Students also used to conduct some skill oriented workshops to fabricate viz. telescope under the guidance of some expert.

Visit us at: <https://astroclub.co.in/>

Faculty Incharge: Dr. S.R. Tiple

- **Recognized Center for National Graduate Physics Exam (NGPE) and NAEST**

Bajaj College of Science is the recognized center for the NGPE and NAEST examination conducted by the national body Indian Association of Physics Teachers (IAPT) since last decade.

Faculty Co-ordinator: Dr. G.V. Lakhotiya

## **Highlights of the syllabus under Autonomy:**

The course design ensures that the graduating students with Physics as one of the subjects will have the academic standard pre-requisites to take post-graduation programme in Physics as well as in many allied fields in India and abroad. The multidisciplinary skills they will be acquiring will be of tremendous value to them especially if they choose to enter such cutting-edge research areas; be it in Academia or in Industry. We believe that the graduates with physics will be positioned to face any national competitive exams held for the graduates.

Syllabus contains the core branches including mechanics, oscillations and waves, thermodynamics, electrostatics, electricity and magnetism, electrodynamics, optics, atomic and molecular physics, statistical mechanics, solid state physics, quantum mechanics, electronics and solid-state devices, nanophysics, astrophysics, relativity, nuclear physics. Along with the theory, skill-oriented experiments including some innovative projects will prepare the students to orient themselves to bridge the gap between science and technology.

For more details, kindly visit <http://jbsw.shikshamandal.org/wp-content/uploads/2019/07/BOS-ALL-SEM-Final-Syllabus-as-on-04-July-2019.pdf>

## **Completed Research Projects:**

- 1.** Study of Attenuation of high frequency acoustic waves in pure semiconductors using elastic constants.

Funding Agency: UGC WRO (0.85 Lac)

Principal Investigator: Dr. S.H Bagade

- 2.** Mathematical modelling for thermoelastic behavior of different solid body structures subjected to heating

Funding Agency: UGC WRO (1.5 Lac)

Principal Investigator: Dr. S.H Bagade