

**AMAR SHAHEED BABA AJIT SINGH JUJHAR SINGH MEMORIAL
COLLEGE, BELA (ROPAR) Pb.**

Department of Physical Sciences

Department Profile



1. **Name of the Department:** Physical Sciences

2. **Vision of the Department:** The Physical Sciences department prepares students for a diverse and changing world. We built foundation for excellence and spur development of the Institution by igniting and nurturing and enthusiasm, interests and passion, in the study of science, in professional courses, as a part of curricula.

3. **Mission of the Department:**

- To provide rigorous preparation of students whose career paths require expertise in Science and Technology by using modern educational techniques.
- To provide quality and value based education to the students, a vast majority of which comes from nearby rural areas.
- To foster creativity in the minds of students and leadership qualities so that they develop proper aptitude to become outstanding researchers, scientists, and technical experts.
- Dedication to rigorous standards for content, knowledge, communication skills, research quality and professional behaviour.
- To build interaction with reputed universities/colleges/institutions to focus on new strategies for enhancing employability of students.
- To enable the students to select various options for higher studies like M.Sc. in physics, chemistry, and maths and provide a good platform to create interest in other technical courses.
- To develop educational programs that meet the requirements of society.

4. **Departmental Profile:**

Year of establishment:

Science (Non-medical & Med.)	: 1994
B.Sc. (Non-medical)	: 2004
B.Sc. (Computer Science)	: 2008
B. Voc. (Renewable energy Technology)	: 2019

Names of Programme/ Courses offered: No. of Seats

B.Sc. Non-Medical	: Open
B.Sc. Computer Science	: 50
B. Voc. Renewable energy Technology	: 40

With the advancement in the area of science and technology, this evergreen programme has become one of the highly studied degree course all over the world. The main aim of the course is to develop deeper understanding of natural laws, inquiring about the reason and logic which helps to established methods of experimentations, observations, calculations, etc. Our mission is to give our students the best possible preparation in chemistry, physics as well as mathematics. Besides of this, basic skills and traits of learners should also develop such as observation skills, analytical, scientific, experimental, problem-solving, logical and research skills. Under this department three courses are going very well

which are listed above. After the completion of the B.Sc. degree in Non-medical stream, there are number of options available for the science students. They can go for Master degree (M.Sc.) in Physics, Chemistry and Maths, go in for research and professional job oriented courses and students are also recruited directly by Multinational companies.

Job Opportunities after B.Sc. Non-Medical

There is a great demand for science experts in innumerable government, private and industrial sectors. That's why this course become a very important weapon and opens wide range of opportunities for further studies, research and employments opportunities across the world. It is a broad discipline concerned with natural resources. Following are the fields where science graduate with PCM can use their skills and expertise:

- Air force
- Indian navy
- Defence
- IAS(Indian Administrative Services)
- IPS(Indian Police Services)
- IRS(Internal Revenue Service's)
- IFS(Indian Forest Services)
- SCRA(Special Class Railway Apprentice)
- DRDO(Defence Research And Development Organisation)
- ISRO(Indian Space Research Organisation)
- BPCL(Bharat Petroleum Corporation Limited)
- ONGC(Oil And Natural Gas Corporation)
- BARC(Bhabha Atomic Research Centre)
- SSC(Staff Selection Commission)
- Forensic Science Department
- CIA(Crime investigating Agency)

Area that offers job for B.Sc. degree holders are:

- Merchant navy
- Pharmaceutical Companies (DABUR, RANBAXY, Dr REDDY'S, etc.)
- Testing laboratories
- Biotechnology Firms
- Cosmetic Companies
- Food Firms
- Power Generating Companies
- Chemical Industries and Waste water plants
- Private Petroleum Companies and Oil companies
- Education
- Healthcare and Radiologists
- Research Firms, Agricultural firms
- Environment management and conservation forest services
- Geological survey department
- Engineering firms

A physical science graduate can even join IIT through GATE exam. A PG degree in physical science will lead to do research work in various R&D establishments and government departments. The students of physical sciences have vast scope of recruitment in various fields and wide range of companies. Some of the top recruiters are as follows:

- Tata consultancy services
- Wipro
- IBM
- Infosys
- JP capsule

Job for B.Sc. graduates is not restricted in the field of science, but they can also explore other non-science areas like:


Higher studies:



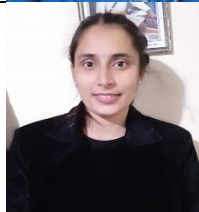


- MBA master of Business
- MCA Master of computer application and IT
- Aviation
- Engineering
- Architecture
- Multi media
- Animation
- Interior designing
- Fashion designing
- Banking sector

The students of computer science can get jobs as web designer, web developer, computer aided design, call centres.

B.voc (RET) is an emerging skill oriented course that aims at providing adequate skills required for a particular trade. Renewable energy particularly solar energy is the most promising alternatives for a cleaner and greener future produced from sources that do not deplete or can be replenished with human life time. There is a huge demand set by Government of India for RE to have skilled manpower in every area of RE including installation, System designing, operations, maintenance, financing, equipment manufacturing and marketing. Top recruiters of B.Voc students are -Bosch solar solutions, HFM solar power private limited, global power industry etc.

5. Faculty of the Department:

S. No.	Name	Qualification	Designation	Specialization	No. of Years of Experience	Phographs of faculty
1.	Dr. Satwant Kaur Shahi	M.Sc., B.Ed., M.Phil, Ph.D.	Associate professor	Organic Chemistry	29 years 7 months	

2.	Dr. Baljit Singh	M.Sc., Ph.D	Associate professor	Nuclear Physics	27 years 6 months	
3.	Jaspreet Kaur	M.Sc. , B.Ed.	Assistant Professor	Experimental physics and electronics	5 years 5 months	
4.	Ramanjeet Kaur	M.Sc. , B.Ed	Assistant Professor	Inorganic and Organic Chemistry	3 years 2 month	
5.	Himani Saini	M.Sc.	Assistant Professor	Physical Chemistry	2 years 2 months	
6.	Neha Chouhan	M.Sc.	Assistant Professor	Nano physics	1 years 2 months	

6. Achievements/Publications of Faculty:

Paper Published: Dr. Satwant Kaur Shahi

1. Synthesis, characterization and photocatalytic activity of magnetically separable γ -Fe₂O₃/N,Fecodoped TiO₂heterojunction for degradation of Reactive Blue 4 dye Navneet Kaur, **Satwant Kaur Shahi**, Vasundhara Singh, **RSCAdvances**, **2015,5, 61623-61630. Citations:10.**
2. Green synthesis of photoactive nanocrystallineanatase TiO₂ in recyclable and recoverable acidic ionic liquid [Bmim]HSO₄, **Satwant Kaur Shahi**, Navneet Kaur, Amanpreet Kaur, Vasundhara Singh,**J. Mat. Sci.**, **2015, 50 (6), 2443-2450. Citations :14**
3. Anomalous behavior of visible light active TiO₂ for photocatalytic degradation of different Reactive dyes, Navneet Kaur, **Satwant Kaur Shahi** and Vasundhara Singh, **Photochemical and Photobiological Sciences**, **2015, 14, 2024-2034. Citations :19**

4. Fabrication of phase and morphology controlled pure rutile and rutile/anatase TiO₂ nanostructures in functional ionic liquid/water, **Satwant Kaur Shahi**, Navneet Kaur, Vasundhara Singh, **Applied Surface Science**, **360 (B)**, 2016, 953-960.

Citations :18

5. Choline chloride assisted synthesis of N and metal co-doped TiO₂ and their photocatalytic activity under visible light" Navneet Kaur, **Satwant Kaur Shahi**, Vasundhara Singh, **Photochemistry and Photobiology**, **92**, 2016, 69–75.

Citations : 05

6. Preparation, characterization and photocatalytic degradation kinetics of Reactive Red dye 198 using N, Fe codoped TiO₂ nanoparticles under visible light, Navneet Kaur, **Satwant Kaur Shahi** and Vasundhara Singh, **Desalination and Water Treatment** **57(20)**, 2016 ,9237-9246. **Citations :11**

7. Influences of a new templating agent on the synthesis of coral-like TiO₂ nanoparticles and their photocatalytic activity, **Satwant Kaur Shahi**, Navneet Kaur, Sofia Sandhu, J.S. Shahi, Vasundhara Singh, **Journal of Science: Advanced Materials and Devices** **2**, 2017, 347-353. **Citations :01**

8. Investigation of morphologies, photoluminescence and photocatalytic properties of ZnO nanostructures fabricated using different basic ionic liquids, **Satwant Kaur Shahi**, Navneet Kaur, J.S. Shahi, Vasundhara Singh, **Journal of Environmental Chemical Engineering**, **6**, 2018, 3718-3725. **Citations :03**

9. Acidic ionic liquids: an alternate to HF for (001) reactive facet controlled synthesis of anatase titania, Sofia Sandhu, **Satwant Kaur Shahi** and Vasundhara Singh, **New Journal of Chemistry**, 2018, **42**, 12762-12765. **Citations: 02**

10. Green synthesis of nano-sized Calcium titanate using solid state mechanochemical solventless method and its characterization, Pawanpreet Kaur, Rama Arora, **Satwant Kaur Shahi** and J S Shahi, **IJREAM**, **4**, 2018, 106-110.

Paper Published: Dr. Baljit Singh

1. Literature review on disciplinary research on Environmental development, baljit Singh, Panchibati Sandesh (Interdisciplinary Research Journal), **40**, 2018, 99-104.

Paper Published: Ramanjeet Kaur, Himani Saini, Jaspreet Kaur

1. Global and Indian scenario of child sex abuse, Ramanjeet Kaur, Himani Saini, Jaspreet Kaur, Journal of emerging technologies and innovation, **6**, 2019, 1-6.

PAPERS PRESENTED IN CONFERENCES: Dr. Satwant Kaur Shahi

International Conferences

- Paper presented as “Green synthesis of biphasic TiO₂ nanoparticles using acidic deep eutectic solvents: Characterization and photocatalytic activity” at **international conference on Green Chemistry Engineering and Technologies for sustainable development (GCET-2017)** held from April 20-22, **2017** at Chandigarh, organized by Department of Chemistry, PU Chandigarh and Florida Technical University, Lakeland, USA.
- Paper presented at **fourth International Conference on Advanced Oxidation Processes AOP-2016** held from 17th-20th Dec. **2016** at BITS Pilani, K. K. Birla Goa Campus, Goa.
- Paper presented as “Phase-selective preparation of TiO₂ nanoparticles from sulphonic acid ionic liquid”, at **third International Conference on Advanced Oxidation Processes AOP-2014** held from 25th-28th Sept. **2014** at Munnar, Kerala.

Short term course/ Faculty development Programme

- Participated in **Global Initiative for Academic Networks (GIAN) ‘X-ray Absorption Spectroscopy: Materials inside- Analysis Tool’** held at Chandigarh (**Oct. 3-8, 2017**) by Panjab University, Chandigarh in collaboration with Institute of Inorganic Chemistry SB RAS, Novosibirsk, Russia.
- Participated in **Shortterm course “Instrumental Techniques for Chemical and Materials Analysis” (ITCMA-2015, Dec. 21-25, 2015)** held at PEC University of Technology, Chandigarh.

National Seminar/ Workshops:

- Presented paper **National seminar on “Advancement in Science and Technology (ONSAT-2017)”** (March 4, **2017**) held at PEC University of Technology, Chandigarh.
- Attended **National Workshop on “X-Ray Techniques for characterization of materials”** (Feb 11-13, **2015**) held at SAIF/CIL, Panjab University, Chandigarh.
- Attended **National Workshop on “Recent Developments in Functional Materials”** (April 13, **2013**) held at PEC University of Technology, Chandigarh.

International/National Symposium:

- Paper presented as “Ionic liquid assisted synthesis of thermally stable nanosized anatase TiO₂ with enhanced photocatalytic activity” at **international symposium on functional materials** held from April 13-15, **2018** at Chandigarh, organized by IIT Kanpur, PU Chandigarh and University of Illinois at Chicago.
- Paper presented titled “Facile synthesis of shape tunable small sized nanostructures with opticles properties and photocatalytic activities” **National Symposium on Triumphs of Sustainable progress in Chemistry** (22-23 Feb., **2018**) held at Department of Chemistry, PU Chandigarh.
- Paper presented titled “**Effect of phase change behavior of nano crystalline TiO₂ using functional Ionic liquid**” at 16th **CRSI National Symposium in Chemistry (NSC-16)** held from 7th-9th Feb. **2014** at IIT Bombay.

Paper Presented/Workshop/FDP : DR. Baljit Singh

- Paper presented in National Seminar on” Science-Technology and Human Rights “National Seminar held at A.S.B.A.S.J.S.M.College Bela College on 27-28 Feb. 2015.
- Participated in workshop “Computer Interfaced Science Experiments” at Sri Guru Teg Bahadur Khalsa College Sri AnandpurSahib,Distt. Ropar on 12-04-2016.
- Attended FDP “A Step towards Enhancement of efficiency & Excellence” at A.S.B.A.S.J.S.M. College Bela on 28-07-2016.
- Attended FDP “Classroom Teaching, Attitude of Teachers & General strategies to increase the Effectiveness of Classes” at A.S.B.A.S.J.S.M.College Bela on 20-07-2018.
- Participated in FDP “Teaching Pedagogy in digital age: Opportunities & Challenges” at Maharishi Markaneshwar University, Sadopur. Ambala (Haryana) on 04-05-2019.

Achievements of Faculty

Faculty as members in

- a) **Member in National committees: Dr. Satwant Kaur Shahi**
 - **Member of Faculty of Physical Sciences**, Punjabi University, Patiala from Aug 2000 to May 2002 via letter No. 4443 dated 29/8/2000
 - **Member of Faculty of Physical Science** Punjabi University, Patiala from Mar 2003 to Jan 2005 via letter No. 2274 dated 6/3/2003
 - **Member of Faculty of Physical Sciences**, Punjabi University, Patiala from Feb 2009 to Jan 2011 via letter No. 1396 dated 20/2/2009

- **Member of Faculty of Physical Sciences, Punjabi University, Patiala** from Mar 2015 to March 2017
- **Member of Board of Studies, Physical Sciences, Punjabi University, Patiala** from Mar 2015 to March 2017
- **Member of Faculty of Physical Sciences, Punjabi University, Patiala** from Feb 2019 to 11 Jan 2021 via ref. letter no. 381 dated 01/02/ 2019.

Member in National committees: Dr. Baljit Singh

- Member of Board of Study in Physical Sciences 09-08-2001 to 11-01-2003 ref. letter no. 6933 dated 09.08.2001.
- Member of Board of Study in Physical Sciences 06-03-2003 to 11-01-2005 ref. letter no. 2273 dated 06.03.2003.
- Member of Board of Study in Physical Sciences 22-03-2013 to 11-01-2005 ref. letter no. 868 dated 22.03.2013.
- Member of Board of Study in Physical Sciences 06-03-05 to 11-01-2005 ref. letter no. 2273 dated 06.03.2005.
- Member of Board of Study in Physical Sciences 28-02-2005 to 11-01-2007 ref. letter no. 949 dated 28.02.2005.
- Member of Board of Study in undergraduate in Physics 20-01-15 to 31-12-2016 ref. letter no. 413 dated 20.01.2015.
- Member of Board of Study in Physical Sciences 08-02-2017 to 11-01-2019 ref. letter no. 5426-94 dated 08.02.2017
- Member of Board of Study in undergraduate studies in Physics 03-01-19 to 31-12-2020 ref. letter no. 11 dated 03.01.2019.

7. Academic Calendar of the Department

Sr. No.	DATE	ACTIVITY
1	25-7-2019-26-7-2019	Orientation program
2	09-8-2019	Poster making competition
3	20/09/2019	Industrial visit
4	10-10-2019	Paper reading
5	11-10-2019	Notice board
5	11-11-2019	Expert talk
6	14/11/2019	Children day celebration
7	24/01/2020	Science spectacular
8	02-07-2020	Health and Nutrition
9	20/02/2020	Science day celebration

10	03-06-2020	Educational tour
11	20-03-2020	Science outreach Program
12	17-4-2020	Workshop

8. SWOC:

Strengths:

- Department has a well-qualified dedicated faculty, out of which two faculty members are Doctorate of Philosophy.
- One faculty member has received major project of Rs. 24.22 Lakh from DRDO in collaboration with PEC Chandigarh.
- Faculty members are on the panel of Board of studies in the affiliating university.
- Faculty holds responsible positions in the college such as exam. Registrar, Convener of different committees in the college and in charge of various college activities.
- Many students passed out from the department are well placed and holds important positions in different fields.
- Adequate, smart classrooms and well-equipped laboratories with necessary equipment and apparatus to cater to needs of the students.
- Library and Internet facility for academic improvement of students.
- Good Departmental library in which books are issued to the needy students on yearly basis.
- Department organizes student oriented activities such as quiz, notice board competition, seminars, lectures, science exhibition, declamation, education and industrial visits etc.

Weaknesses:

- Most of the students come from rural areas and have poor educational and economically weak background.
- Lack of more sophisticated instruments and space for research activities.

Opportunities:

- Growing demand for science courses.
- The level of academic excellence which department has acquired makes it possible for the students to get entry into higher education institutes of global repute.

- The students are encouraged to participate in workshops, seminars, exhibitions to expose them to the latest developments in the field.

Challenges:

- To create research environment and to explore collaborative research.
- To make students job market oriented.
- To maintain the level of moral and ethical values among the students.
- To make students globally competent, skilled and competent to crack competitive exams.

Future Plans:

- To start in house projects for students so as to develop research potential of the students.
- To encourage students to attend summer courses, trainings and internships.
- To organize international/national academic activities.
- To establish renewable energy system.
- To establish collaboration with industries for training and placements of the students.
- To organize seminars, workshop, lectures etc.by inviting eminent scientists.

9. Activities of the Department:

Students and teachers at Nobel Museum Exhibition, NABI



Students getting knowledge about working of Thermal Power Plant, Ropar



Science students exhibiting their models with theme *“science for people and people for science”*



Interclass Notice Board competition



Students celebrating green Diwali in Rangoli and diya making competition



10. Shining Stars of the Department:



Balwinder Kaur
CSIR-JRF- NET,
Ph.D. from IIT
Ropar, Research
Fellow at Boston,
USA



Employed at
Forensic Science
laboratory,
Mohali



Mandeep Singh
Employed at
Forensic Science
Laboratory, Ropar,
Punjab



Gurpreet Singh
employed in
Warehousing
Corporation, Punjab



Varinder Rai placed
at Talwandi Sabo
Power Ltd.



Harpreet Kaur
B.Sc. CA,
employed in
Punjab police



Jagmohan Singh
Employed in
Indian navy

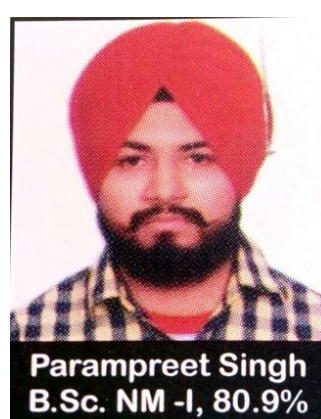
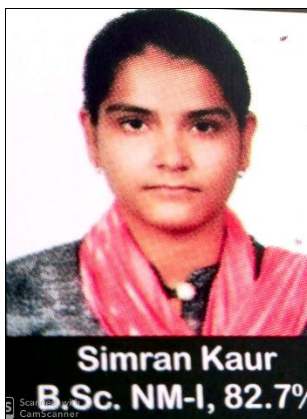


Tarlochan Singh
Employed in
Indian navy



Amritpal Singh
Employed in Punjab
police

Meritorious students:





Pooja
B.Sc. NM-II, 82%



Kamaljeet Kaur
B.Sc. (N.M.) 80%



Priyanka
B.Sc. (N.M)-II, 82%



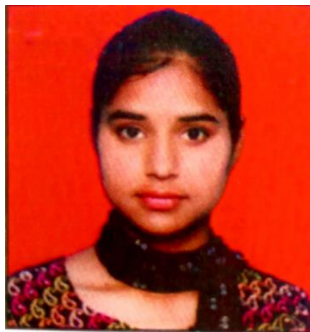
Gurleen Kaur
B.Sc. NM-II, 81%



Daljeet Kaur
B.Sc. NM-II, 79.3%



Parminder Kaur
B.Sc. (N.M.) 86%



Kulvir Kaur
B.Sc NM-III, 82%



Ruchika
B.Sc. (CA) 78%



Ratinder Singh
B.Sc. CA-III, 80%



Kirandeep Kaur
B.Sc. NM-III, 81%



Amanpreet Kaur
B.Sc. NM-III, 76.9%



Manpreet Kaur
B.Sc. NM-III, 76.9%



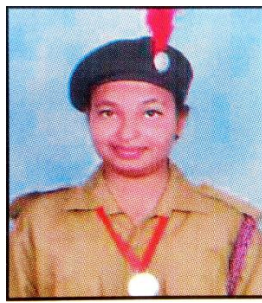
Manjeet Kaur
BSc. NM-82 %



Manjeet Kaur
BSc. NM-81.5%



Mandeep Singh
B.Sc. (CA)-II, 1st in
cultural activity and
position in firing



Kiranjeet Kaur,
BSc. (NM)-II, 1st in
cultural activity