Biodata



Dr. Popat Savaleram Tambade

IQAC Coordinator & Vice Principal

Prof. Ramkrishna More Arts, Commerce and Science College, Akurdi, Pune 411 044. India (NAAC Accredited A+ with CGPA 3.46)

Previous positions

Convener

Board of Studies-Science and Technology Maharashtra State Board of Secondary and higher Secondary Education, Pune (2014-2017)

Member,

Board of Studies in Physics, Syllabus committee Savitribai Phule Pune University, Pune 411007 (2010-2015)

Residential Address

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Chinchwad, Pune 411019. (India)Email:pstam3@rediffmail.comMobile:8605529031/8459427151☎ Office:YouTube : PST EduMediawww.slideshare.net/popattambade

Educational Qualifications

- B. Sc. Physics (1989) : Pune University : First Class with distinction with **Third Rank** in Pune University.
- M. Sc. Physics (1991): Pune University: First Class with specialization in Astrophysics
- SET Physics (1995)
- Ph. D. (2009) : Yashwantrao Chavan Open University, Nashik on Subject Communication (Physics)

Teaching Experience

- B. Sc. (Physics): Since June 1992
 Subjects Taught: Quantum Mechanics, Classical Mechanics, Computational Physics, Mathematical Physics, Electronics, Waves and Oscillations, Optics, Heat and thermodynamics
- M. Sc. (Physics): Since July 2005
 Subjects Taught: Quantum Mechanics, Classical Mechanics, Computational Physics

Awards

- "Outstanding Paper Award" for the paper "Investigating effect of Computer Simulations in Physics Teaching at Undergraduate Level" presented in E-Learn 2008 World Conference on E-Learning in Government, Corporate, Health care and Higher education held at Las Vegas, Nevada, USA from 21st Nov. to 25th Nov. 2008.
- Amrut Pratibha Award for best Educational Services on the 75th Birthday of Hon. President Pratibha Patil from Amruta Pratibha Foundation.
- Dipastambha Award for best Educational Services on 18th July 2010 by Sahakary Seva Sanstha, Manor, Dist- Thane : NGO working in the field of tribal in India.

Research Activities, Publications and Inivted Talks

| Research Guide: | Ph.D. and M. Phil. In Physics-Savitribai Phule Pune University |
|------------------------|--|
| | Ph.D. declared : 03 candidates |
| | Ph.D. registered : 04 candidates |
| | M. Phil. Registered : 01 Candidates |

Research Area: Nanotechnology, Computational Physics, Quantum computing and Physics Education

Research Project: Completed one research project entitled 'Investigation of Computer Based Teaching Methods in Physics for Classroom Teaching' funded by University of Pune in the period 2006-07 to 2008-09.

Research Publications

- **1.** D.R. Shinde, **P.S. Tambade***, M.G. Chaskar, K.M. Gadave (2017). Photocatalytic degradation of dyes in water by analytical reagent grades ZnO, TiO₂ and SnO₂: a comparative study. *Drinking Water Engineering and Science* 10 (2), 109-117
- 2. D. Shinde, P. Tambade*, H. Pathan, K. Gadave (2017). Experimental and theoretical study of 1, 4-naphthoquinone based dye in dye-sensitized solar cells using ZnO photoanode. *Materials Science-Poland* 35
- **3.** S Arya, H Sonawane, S Math, **P Tambade** (2021), M Chaskar, D Shinde. Biogenic titanium nanoparticles (TiO₂ NPs) from Tricoderma citrinoviride extract: synthesis, characterization and antibacterial activity against extremely drug-resistant ...*International Nano Letters*. 11 (1), 35-42.
- 4. DR Shinde, P. S. Tambade, KM Gadave, KS Pawar, M Naushad (2017). Dye-sensitised solar cells with a naturally occurring pigment lycopene as a photosensitiser for zirconium dioxide: an experimental and theoretical study. *Journal of Materials Science: Materials in Electronics*. 28 (15), 11311-11316.
- **5.** RA Pawar, DR Shinde, **PS Tambade** (2016). Synthesis of ZnO photocatalyst via ZnO2 precursor and its application for dye degradation from effluent under solar irradiation. *Desalination and Water Treatment*. 57 (35), 16514-16521
- 6. I.S. Quirishi, RA Pawar, DR Shinde, **PS Tambade**, MG Chaskar (2019). Solar Photocatalytic Activity of Nanocrystalline ZnO Obtained from different Precursors. *Asian Journal of Chemistry* 32(5), 1-6
- 7. Nilanjan Dasgupta* and P. S. Tambade. Effect of Initial Phase on Short Time Limit of Noisy Quantum Walk. IJSRST | Volume 4 | Issue 2.
- 8. Nilanjan Dasgupta* and P. S. Tambade. First Moment of Non Interacting Discrete Type Quantum Walkers: Effect of Non Local Initial States. *International Journal of Engineering Technology Science and Research*, 5(4).
- **9. P. S. Tambade** (2012). Visualizing superposition principle in Infinite Square well potential. *Lat. Am. J. Phys. Educ.* Vol 6 (3), 362
- **10. P. S. Tambade** (2011). Spreadsheet Implementation for Momentum Representation of Gaussian Wave Packet and Uncertainty Principle. *European J Of Physics Education* 3 (1)
- **11. P. S. Tambade** and B. G. Wagh (2011). Assessing the Effectiveness of Computer Assisted Instructions in Physics at Undergraduate Level. *Eurasian Journal of Physics and Chemistry Education* 3 (2), 127-136.
- **12. P. S. Tambade** (2012). Use of Spreadsheet for the Perturbation theory in Quantum Harmonic Oscillator. *European Journal of Applied Sciences* 3 (4), 117-124
- **13.** P. S. Tambade (2011). Harmonic oscillator wave functions and probability density plots using spreadsheets. *Latin American Journal of Physics Education*, 5(1), 43-48.
- **14. P. S. Tambade** (2011). Trajectory of Charged Particle in Combined Electric and Magnetic Fields Using Interactive Spreadsheets. *European J. of Physics Education*, 2(2), 49-59.
- **15. P. S. Tambade(2010).** Effectiveness of Computer assisted Instructions and Cooperative Learning on Students' Conceptual Understanding about Electrostatics. *World Applied Science Journal*, 10(12), 1432-1437.

- **16. P. S. Tambade** and B. G. Wagh,(2007). Numerical Solution of two mutually perpendicular simple harmonic Motion: Lissajous Figures A case Study, *Physics Education*, Vol-24(3).
- **17. P. S. Tambade** and B. G. Wagh,(2010) "Investigation of Students' Understanding in Simple Harmonic Motion" IAPT Bulletin, 2(3), 229-233.
- **18.** VD Kulkarni, **P. S. Tambade.** (2013). Enhancing the Learning of Thermodynamics using Computer Assisted Instructions at Undergraduate Level. *Eurasian Journal of Physics & Chemistry Education 5 (1)*
- **19.** VD Kulkarni, **P. S. Tambade.** (2013). Assessing the conceptual understanding about heat and thermodynamics at undergraduate level. *European J. of Physics Education*, 4(2).
- **20. P. S. Tambade** (2009) "Computer Simulations in Physics Teaching" Shiskhan Sankraman, July 2009.
- **21.** S.D. Aghav and P. S. Tambade. Investigating effects of Geopathic Stress on Health Parameters in Young Healthy Volunteers. *International Journal of Chemical and Physical Sciences* 4 (Special Issue ETP).

Paper presented in International Conference

- P. S. Tambade and B. G. Wagh (2008), "Investigating effect of Computer Simulations in Physics Teaching at Undergraduate Level." Paper presented in E-Learn 2008 – World Conference on E-Learning in Government, Corporate, Health care and Higher education held at Las Vegas, Nevada, USA from 17th Nov. to 21st Nov. 2008.
- P. S. Tambade (2013) Paper presented in E-Learn 2008 World Conference on E-Learning in Government, Corporate, Health care and Higher education held at Las Vegas, Nevada, USA from 21th Nov. to 24st Oct. 2013.
- L. V. Rane and P. S. Tambade (2013) Paper presented in E-Learn 2008 World Conference on E-Learning in Government, Corporate, Health care and Higher education held at Las Vegas, Nevada, USA from 21th Nov. to 24st Oct. 2013.

(The same papers present on the website <u>www.editlib.org</u>)

- **4.** P. S. Tambade (2011). Assessing the Effectiveness of Multimedia in Physics at Undergraduate Level. Paper presented in International Educational Technology Conference 2011, Istanbul University, Istanbul, Turkey, 25-27 May 2011.
- 5. V. D. Kulkarni and P. S. Tambade (2011). *Effectiveness of Multimedia on Conceptual Understanding About Thermodynamics at Undergraduate Level*. Paper presented in International Educational Technology Conference 2011, Istanbul University, Istanbul, Turkey, 25-27 May 2011.
- **6. P. S. Tambade** (2016). *Computational Study of Napthaquinone based dye for dye sensitized solar cells.* Paper presented in International Conference on Functional Eco-friendly Smart Emerging Materials 12-16 March 2016, B. G. College, Pune

Paper presented in National Conference

- P. S. Tambade and B. G. Wagh. (2005). "Simulation of Simple Pendulum on Computer and Study of its Characteristics." Paper presented in UGC sponsored National Symposium on Impact of Information Technology on Physics Education held at Bhubaneshwar from 21st -23rd Oct 2005.
- P. S. Tambade and B. G. Wagh. (2007). "Investigation of Students' understanding in Electrostatics." Paper presented in IAPT Convention Simla, Himachal Pradesh from 23rd – 25th Nov. 2007.

- 3. **P. S. Tambade** and V. D. Kulkarni (2010). "Investigating Effectiveness of Computer assisted Instruction in Electrostatics " Paper presented in 25th IAPT Convention, Saurashtra University, Rajkot, Gujrat from 21st Oct to 23rd Oct 2010.
- 4. **P. S. Tambade (2011).** "Spreadsheet simulations in Physics Teaching learning at college level" Paper presented in National Conference on Opportunities and Challenges in Higher Education-2011 organized by H. V. Desai College, Pune. 30 Nov. 2 Dec. 2011.
- 5. **P.** S. Tambade (2011). "Use of Interactive Spreadsheets in One dimensional Infinite Potential well problem". Paper presented in 26th Annual Convention of IAPT, University of Rajasthan, Jaypur, 9-12 October 2011.

Books Published

Co-author of Following Text books published according to syllabi of Pune University

- 1. Mathematical Methods in Physics (T. Y. B. Sc.) (1998) Nirali Prakashan, Pune.
- 2. Classical Electrodynamics (T. Y. B. Sc.)(1998) Nirali Prakashan, Pune.
- 3. Physics I (F. Y. B. Sc.) (2002) Nirali Prakashan, Pune
- 4. Physics I (F. Y. B. Sc.)(2002) Nirali Prakashan, Pune
- 5. Oscillations, Waves and Sound (S. Y. B. Sc.) (2003) Nirali Prakashan, Pune(Rev. Edition 2009, 2014, 2020).
- 6. Electricity and Magnetism (S. Y. B. Sc.) (2003) Nirali Prakashan, Pune (Rev. Edition: 2009, 2014)
- 7. Mathematical Physics (S. Y. B. Sc.) (2003) Nirali Prakashan, Pune. (Revised Edition 2009,2014, 2019)
- 8. Electronics (S. Y. B. Sc.) (2003) Nirali Prakashan, Pune. (Revised Edition -2009, 2014, 2020)
- 9. Mathematical Methods in Physics (T. Y. B. Sc.) (2004) Nirali Prakashan, Pune.(Revised Edition -2010, 2015, 2021)
- 10. Classical Electrodynamics (T. Y. B. Sc.) (2004) Nirali Prakashan, Pune.(Revised Edition -2010, 2015,2021)
- Quantum Mechanics (T. Y. B. Sc.) (2004) Nirali Prakashan, Pune. (Rev. Edition: 2010, 2015)
- 12. Nuclear Physics (T. Y. B. Sc.) (2004) Nirali Prakashan, Pune. Rev. Edition: 2010, 2015)
- Solid State Physics (T. Y. B. Sc.) (2004) Nirali Prakashan, Pune. Rev. Edition: 2010, 2015)
- 14. Computational Physics (T. Y. B. Sc.) (2004) Nirali Prakashan, Pune. Rev. Edition: 2010, 2015, 2021)
- 15. Jigar's (MHT-CET) Physics (2007) Pragati Prakashan, Pune. .(Revised Edition -2010)
- 16. All in One Physics –II (2008) Nirali Prakashan, Pune.
- 17. Mechanics and Emerging Physics (F. Y. B. Sc.) (2008) Nirali Prakashan, Pune.
- 18. Heat and Thermodynamics, electricity and Magnetism (F. Y. B. Sc.) Nirali Prakashan, Pune.
- 19. Mathematical Methods in Physics (S. Y. B. Sc.) (2009) Nirali Prakashan, Pune. (According to revised syllabus).
- 20. Instrumentation (S. Y. B. Sc.) (2009) Nirali Prakashan, Pune. .(Rev. Edition 2014, 2020)
- 21. Optics (S. Y. B. Sc.) (2009) Nirali Prakashan, Pune.(Rev. Edition 2014, 2020)

Resource Person and Invited talks

1. Delivered talk on "Programme outcomes and Course outcomes-Development and attainment" in National Conference on Best Practices in Higher Education, organized by Loknete Vinayakrao Hiray College, Nashik. 30-31 January 2020.

- 2. Delivered talk in National Conference on "Role of Physics in sustainable development" organized by Sangamner Mahapalika's Malpani College, Sangamner. 7 9 Feb 2013.
- 3. National Webinar on Physics Education Post Covid Era organized by Indian Association of Physics Teachers 21-22 July 2020. Topic: E-content Development for Physics.
- 4. National webinar talk on "Policy Documents for NAAC Accreditation" organized by Bharat College Badlapur, Thane, Maharashtra on 15th June 2020.
- Webinar talk on E-Content Development" organized by A. E. Kalsekar Degree College, Mumbra Thane on 17th March 2021.
- 6. Guest lecture on "Programme Outcomes, Course Outcomes and attainment methods" in State level seminar organized by T. C. College Baramati on 14 -15 Feb 2020.
- 7. Guest Lecture in Webinar on "Measuring the Attainment of Learning Outcomes" organized by Justice Basheer Ahmed Sayeed College, Chennai on 11th July 2020.
- 8. Guest Lecture on "Policy Procedures and Accreditation" in Faculty Development programme organized by Dnyan Ganga Education Trust's Degree College, Thane 27-29 May 2020.
- 9. Guest Lecture on NAAC Accreditation: Policy and Procedures"in National Webinar on "Sharing Experiences of NAAC Accreditation Process: Affiliated Colleges with grade A+/A++ in NAAC RAF" organized by Sanatan Dharma College, Ambala Cantt. Haryana, on July 24, 2021
- 10. National level lecturer series "Capacity Building Programme in Physics" organized by KTHM College, Nashik on 24th August 2021.
- Guest Lecture in Lecture Series on "Preperation of National Physics Graduate Examination (NGPE)" organized by Indian Association Of Physics Teachers SRC08C 04 – 11 January 2021.
- 12. One day workshop on "Use of Computer Simulations and Information Technology for Physics Teaching at UG level" held on 18th Dec. 2008 organized by Arts, Commerce and Science College, Saikheda, Nashik.
- 13. One day workshop on "Computer Applications in F. Y. B. Sc. Chemistry Syllabus" held on 14th Sept. 2002 organized by Arts, Commerce and Science College, Akurdi, Pune.
- 14. Resource person in One day seminar on "Impact of IT on Physics Education" organized by C. T. Bora College, Shirur, Pune.
- 15. Resource person in one day workshop on Use of ICT in Teaching Physics organized by Dada Patil College, Karjat (Ahmednagar) on 12th Feb. 2012.
- Resource person in one day workshop on "Teaching and learning of Physics by Co-operative and Participatory Approach" organized by Adv. M. N. Deshmukh ACS College, Rajur, Dist – Ahmednagar on 3rd Feb. 2007.
- 17. State level workshop on "Connectivity between University and the College through online Network for Virtual Classroom", 23-24 January 2009 organized by K. A. A. N. M. Sonawane ACS College, Satana, Nashik. Delivered talk on 'Pedagogical Content Knowledge and Virtual Classroom.'
- 18. Resource person in Teacher Training Program for Junior College Teachers at Shardabai Pawar College, Shardanagar, Baramati, Dist-Pune in May 2009.
- 19. One day workshop on "Framing the syllabus for T. Y. B. Sc. Physics", CT Bora College, Shirur, Pune on 12th Dec. 2009.
- 20. Resource person in One day workshop on "Simulation Tools for Physics and Electronics" organized by Arts, Commerce and Science College, Saikheda, Nashik on 16th Jan. 2010.
- Resource person in One day workshop on "Use of Computer Simulations and Information Technology for Physics Teaching at UG level" organized by Arts, Commerce and Science College, Saikheda, Nashik on 18th Dec. 2006.

- 22. Invited Plenary lecture on "Upgraded Syllabus of XIIth Science" organized by Annasaheb Magar College, Hadapsar, Pune. 6 7 July 2012.
- 23. Delivered lectures on physics in different colleges as guest lecture.
- 24. Delivered lecture on Use of Computers in Teaching in Refresher Course on Information and Technology.

Teaching Learning and Practices

As a Physics Educator actively involved in curriculum design, innovations in teaching and learning.

Programme Outcomes/Course Outcomes/ Curriculum design

- Developed programme outcomes and course outcomes for UG and PG programmes in physics based on Bloom's Taxonomy,
- Developed attainment method for course outcomes and programme outcomes as per Learning Outcome based curriculum framework of UGC,
- Delivered lectures on design and development of Programme and Course Outcomes,
- Actively participated in curriculum development of B.Sc./M.Sc. Physics as Syllabus committee member of Savitribai Phule Pune University, Pune;
- Acted as resource person on syllabus revision workshops organized by different colleges as per university guidelines;
- Designed curriculum for B. Voc. Automotive electronics in college.

Teaching Learning Methods used

In addition to classroom teaching-learning different learning approaches used

Experiential Learning:

- Industrial visits are arranged for students.
- Student visits are arranged to Research Laboratories and Research Institutes such as IUCAA, NCL, IISER
- Student visits are arranged to Science Park.
- Study tours are arranged at different locations.
- In addition to regular practicals, hands on training activities are arranged for students to give learning experience that includes the possibility to learn from natural consequences, mistakes, and successes. For this purpose, new experiments designed through student activities.
- Some of these workshops are like Telescope making workshop, Power supply making workshop, LED bulb making, and Arduino based sensors and experiments are arranged to give hands on experiences.

Participative Learning:

- Students are motivated and guided to participate in Science Exhibitions.
- Students are guided to participate in AVISHKAR research competition. One of my students has received awards at state level competition.
- Student seminars are arranged and observed and students are guided to make PowerPoint presentations.
- Project works are given to students to develop experiments and equipments and computer interfaced experiments. These developed experiments and equipments are used for regular practical in laboratories.

Scientific tinkering:

- In this activity the student chooses from a wide selection of recycled materials, easily available materials and low-tech tools to develop experiment. Students are taught about laws that should be verified by building experiments from these materials. Through their explorations, students may engage in engineering, making and 'tinkering' i.e. wilfully experimenting with the different materials as they develop their thinking and set new experiments.
- Experiments like freely falling body, damped oscillator pendulum, forced oscillator pendulum, experiment on electromagnetic induction, dc motor demonstration etc. are developed through this technique.

Problem solving activity:

- Problem sets are given to students and they were asked to solve problems either individually or in group. In order to solve problems, students are asked to define end goal.
- This step is crucial to successful learning of problem-solving skills. Enough time is given for understanding the problem and defining the goal, both individually and as a group. Help is given to them wherever necessary.
- Some problems are given to students to predict "what would happen if …" or explain why something happened. This helps them to develop analytical and deductive thinking skills.

Creativity & Innovations in Teaching Learning

As a physics educator I have made some innovations in teaching and learning. Following are some glimpses of innovations.

Online Education

YouTube Channel: PST EduMedia

Started YouTube Channel **PST EduMedia.** On this channel following types of videos are uploaded.

- Videos on topics of Physics like Mathematical Methods in Physics, Computational Physics, Quantum Mechanics etc. In this video each concept is explained with animations and simulations.
- Videos on Virtual Labs in Physics.
- Videos on Multiple choice questions subjects like Mathematical Methods in Physics, Computational Physics, Quantum Mechanics, Classical Mechanics, Waves and Oscillations, Electronics, Nuclear Physics etc. are uploaded. In this video physics concepts are explained with using MCQs. These videos are useful for online University examinations, competitive examinations like IIT JAM, UPSC, NET etc.
- Videos for teachers on development of simulations, animations and video lectures for online teaching.
- Videos for Guidance on NAAC accreditations for teachers and colleges.
- Live lectures are taken on YouTube

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LMS: Google Clasroom

Screenshots of some videos on YouTube:

Google classroom used to share ideas and resources with Students. Notes, PowerPoint presentations, video lectures assignments, practical manuals are shared using classroom app. Online examinations for internal evaluation is done through this platform.

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Development of Virtual Labs

For better understanding of experiments in Physics and conceptual understanding Virtual experiments are developed and made available to the students.

Following are screenshots of some virtual lab experiments.





Development of computer Simulations

For better understanding of Physics and conceptual understanding computer simulations are developed using MS Excel spreadsheets and C programming. These simulations are used during classroom and made available to the students. Topics covered in subjects : Quantum Mechanics, Waves and Oscillations, Classical Mechanics, electrostatics etc.

In addition to this Animations are developed using PowerPoint on the topics of Mathematical Methods in Physics, Quantum Mechanics, Waves and Oscillations, Electronics, Computational Physics, Solid State Physics, Classical mechanics. All these animations are made available to the students through different platforms.

Following are screenshots of some simulations in Physics.



Innovativaions in Laboratory

Computer Interface Experiments:

Following Computer Interface experiments in Physics are developed

- 1. Spring mass system
- 2. Driven pendulum
- 3. Damped pendulum
- 4. Solar cell characteristics
- 5. LCR circuit
- 6. Freely falling body

In addition to these available computer interfaced experiments.





In addition to these available interactive computer interfaced experiments used in the laboratory.

Innovative Experiments Developed:

Research based equipments are developed and used in research

- 1. Cyclic votameter
- 2. Conductivity of ferrite
- 3. Gas sensor





Community Services:

Visited to villages for survey of energy conservation and counseling of energy conservation through NSS of the college.

Help is provided to the teachers to develop PowerPoint presentations for teaching.

Guided students and teachers for NET/SET examinations and students for Medical and engineering entrance tests.

Remedial coaching classes are arranged for SC/ST and minority students.

Help is provided for teachers and researchers in statistical analysis of their results.

Memberships:

Reviewer: European journal of Physics Life Member of Indian Association of Physics Teachers.

Life Member of Parner Taluka Mitra Mandal – the social organization working in the field of social services.

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