# Dr. Haribhau Gholap, Ph.D. (Physics)

## Present position

Associate Professor in Physics, Department of Physics, Fergusson College (Autonomous) Pune

## Contact Details


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## Work Experience

- Teaching: 20 years
- Research: 12 years (after award of PhD degree)

## Personal Profile

I am working as Associate Professor in Physics in Department of Physics, Fergusson College (Autonomous) Pune, India.

I have obtained my Ph.D. (Physics) majored in Materials Science under the mentorship of Prof. Satishchandra B. Ogale, Senior scientist, National Chemical Laboratory in Pune, India and was awarded with PhD Physics degree (June 2013) under the guidance of Prof. Arun G. Banpurkar, and Dr.Gauri Kulkarni, Department of Physics, Savitribai Phule Pune University (formerly University of Pune), Pune.

Being a PhD recognized guide at Fergusson College (Autonomous) Pune in affiliation with Savitribai Phule Pune University, currently Two scholars pursuing PhD degree under my guidance at the Physics Department research center, Fergusson College (Autonomous) Pune.

Presently, we are working on the experimental study of nanomaterials specially semiconductor quantum dots, graphitic carbon nitride, metal oxides, metal nanoparticles, earth abundant materials and doping of CZTS as well as nanocomposites based on these all nanomaterials. Energy, environmental, biological and biomedical applications, Nanobiotechnology: Antibiofilm, Antibiotics degradation, Thermoelectric

applications of quantum dots-bulk nanocomposites, Theoretical: Density Functional Theory (DFT) approach for nanomaterials, Green Synthesis of nanomaterials: Metal, metal oxides, metal sulphides etc.

## Course(s) Taught

- Nuclear Physics
- Solid State Physics
- Material Science
- Experimental techniques in Physics
- Physics of Nanomaterials
- Optics
- Heat and thermodynamics
- Atoms, Molecules and Solids
- Mathematical Methods in Physics
- Statistical Mechanics
- Vacuum technology and Thin film Physics
- Physics of Semiconductor Devices
- Physics principles and applications
- Mechanics and properties of matter
- Modern Physics
- On job training (OJT)
- UG, PG practical laboratories

## Field of Specialization/ Research Areas of Interests

- Experimental (Nanomaterials): Study of nanomaterials specially semiconductor quantum dots, graphitic carbon nitride, metal oxides, metal based and earth abundant materials (CZTS) and doping and nanocomposites based on all these materials
- Energy, Environmental biological and biomedical applications
- Nanobiotechnology: Antibiofilm, Antibiotics degradation
- Thermoelectric applications of quantum dots-bulk nanocomposites
- Theoretical: Density Functional Theory (DFT) Molecular Dynamics (MD) approach for materials
- Green Synthesis of nanomaterials: Metal, metal oxides, metal sulphides ect.

## Education

- **Ph.D. (Physics):** from May 2010 to June2013
  **Title of the Thesis:** Bifunctional Nanoparticles based on Semiconductor Quantum dots: Synthesis & Applications.
  **Name of University / Institution:** Department of Physics, University of Pune, Pune.
  **Date of PhD Award:** 8th June 2013
- **Master of Science- (Physics)**: 2004
- Department of Physics, Savitribai Phule Pune University (formerly University of Pune), Pune
  **Bachelor of Science- (Physics):** 2002
  Jijamata College, Bhende, Newasa, A.nagar, Savitribai Phule Pune University

## Fellowship/Awards/ Certifications/Achievements/Recognitions

1. One year **UGC Raman Post-Doctoral Fellowship at USA**, which was awarded by UGC, New-Delhi (Govt. of India) for an academic year **2016-2017**.
2. **Recognized guide in Physics** for M.Phil. and Ph.D. degree with Savitribai Phule Pune University from the year 2014 and 2024 onwards.
3. Recognition as Permanent Post-Graduate **(PG) Teacher** of Savitribai Phule Pune University, Pune
4. **Visiting Fellowship** by Jawaharlal Nehru Centre for Advanced and Scientific Research (JNCASR), Bangalore in 2013-2014 (three months).
5. **Research fellowship** from Indian Academy of Science, Bangalore awarded at International Center of Materials Science (ICMS), Jawaharlal Nehru Center for Advanced Scientific Research (JNCASR), Bangalore under guidance of Dr.Ranjan Datta in 2014 (two months).
6. Prof.P.S.Damble Prize for the "**Best Oral Presentation**" in Raman Memorial Conference (RMC) in 2012 at Department of Physics, University of Pune
7. **"Best Poster Presentation**" award in National Level Seminar on Nanoscience at Sinnar, Nashik on January 2010.
8. IISER Pune awarded travel grant for Level One Workshop on Researched Based Pedagogical Tools (RBPT) organized by IISER Pune as well as Sheffield Hallam University, UK and sponsored by Department of Biotechnology (DBT), India as well as British Council, India at Jaipur, Rajasthan in 2018.
9. **"Best paper award"** at 4th International Conference on "Global Trends in sustainable technology and its application in Applied Sciences" on 24th and 25th of October 2024 Organized by REVA University in collaboration with INTI University, Bangalore during October 24-25,2024.
10. **Faculty Improvement Programme** (FIP) fellowship for the completion of PhD degree by UGC, New-Delhi (Govt. of India) from Jan- 2011 to Jan-2013.
11. **Qualified State Eligibility Test (MH-SET) in Physical Science,** accredited by U.G.C. & conducted by Savitribai Phule Pune University state Agency in February 2005.

## Member of College Committees/ Professional Bodies and Others

| College Level | Professional Bodies | Others |
|---|---|---|
| Students Welfare Officer (SWO)<br>2015-2016 | Life member: IPA, MRSI, IAPT Indian Biophysical Society | On Job training (OJT), Co-ordinator Research Co-ordinator at Department level |
| Member of NAAC criterion-III upto June 2016 | | Board of Study (BOS), member, Department of Physics, Fergusson College (Autonomous), Pune**.** |
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## Employment History

**Organization :** New Arts, Science, Commence College, Ahmednagar
**Role :** Lecturer (full time)
**Duration :** 13th July 2005 to 30th October 2005
**Organization :** Fergusson College, (Autonomous) Pune

**Role** **:** Associate Professor
**Duration** **:** 21st November 2005 to till the date

## Research Projects

| Title of the Project | Name of Funding Agency | Amount (Rs) | Duration (Year) (From To) | Type (Minor / Major) | Outcome |
|---|---|---|---|---|---|
| Graphitic carbon nitride-based semiconductor quantum dots/metal oxide for photoelectrochemical and antibiofilm applications | DES Fergusson College (Autonomous) Pune in | Rs.1 lacs | 2023-2024 | Minor | Completed |
| Synthesis of semiconductor Quantum Dots-Metal oxide nanocomposite by chemical route | BCUD, Savitribai Phule Pune University | Rs. 2.7 lacs | 2013 -2015 | Minor | Completed |
| Organometallic Synthesis of Semiconductor Quantum Dots | BCUD, University of Pune | Rs. 2.5 lacs | 2009-2012 | Minor | Completed |
| Quaternary semiconductor nanostructure for inhibition of bacterial biofilm formation | University Grant Commission College with Potential Excellence(UGC-CPE) **Amount Rs. 20000/-** | | 2014-2015 Minor Completed | | |
| Effect of ZnO nanostructures on seed germination, nodulation and growth in chickpea. (**Department of Botany, Fergusson College, Pune-4**) | University Grant Commission College with Potential Excellence(UGC-CPE) **Amount Rs. 20000/-** | | 2014-2015 Minor Completed | | |
| Inhibition of bacterial biofilm formation by silver based metal oxide nanocomposites | University Grant Commission - Basic Scientific Scheme (UGC-BSR) **Amount Rs. 5000/-** | | 2014-2015 Minor Completed | | |
| Nanomaterials for Bio-medical & Environmental Applications (Theme Based Poster) | University Grant Commission College with Potential Excellence(UGC-CPE) **Amount Rs. 5000/-** | | 2014-2015 Minor Completed | | |

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| Hand on experiment on short duration course "Introduction to Nanomaterials and Nano-science for undergraduate students" | DBT STAR College Scheme Amount **Rs.200000/-** | 2014-15 Minor Completed |

## Research Publications in National and International Journals

1. Magnetite/CdTe magnetic–fluorescent composite nanosystem for magnetic separation and bio-imaging, A. Kale, S. Kale, P. Yadav, **H. Gholap**, R. Pasricha, J. Jog, B. Lefez, B. Hannoyer, P. Shastry and S. Ogale , Nanotechnology 22 (2011) 225101 (12pp).
2. Quantum dot bio-conjugate: as a western blot probe for highly sensitive detection of cellular protein S. Kale, A. Kale, **H. Gholap**, A. Rana, R. Desai, A. Banpurkar, S. Ogale, P. Shastry J Nanopart Res (2012), 14:732.
3. CdTe-$TiO_2$ nanocomposite: An impeder of Bacterial Growth and Biofilm, **H. Gholap**, R. Patil, P. Yadav, A. Banpurkar, S. Ogale and W. Gade, Nanotechnology 24 (2013) 195101pp.
4. Fluorescent CdTe QDs Embedded Chitosan Nanoparticles : a stable, biocompatible preparation for bioimaging, V. Ghormade, **H. Gholap**, S. Kale, V. Kulkarni, S. Bhat, K. Paknikar, J Biomater Sci Polym Ed. 2015 Jan;26(1):42-56.
5. Quantum dots conjugated Zinc oxide nanosheets: An agent impeding microbial growth and biofilm, R. Patil, **H. Gholap***, S. Warule, A. Banpurkar, G. Kulkarni and W. Gade, Applied Surface Science 326 (2015) 73–81.
6. Synthesis and bio-film inhibition activity of Betulinan C and its analogs, N. Firke, A. Markandeya, R. Patil, **H. Gholap**, R. Deshmukh, S. Pingale, Research J. Pharm. and Tech. 8(1): January 2015, page 54- 58.
7. Stable p-type conductivity in B and N co-doped ZnO epitaxial thin film, R. Sahu, **H. Gholap**, G. Mounika, K. Dileep, B. Vishal, S. Ghara, and R. Datta, Phys. Status Solidi B 253, No. 3, 504–508 (2016).
8. Hierarchical nanostructures of Au@ZnO: antibacterial and antibiofilm agent, **H. Gholap*** S. Warule, J. Sangshetti, G. Kulkarni, A. Banpurkar, S. Satpute and R. Patil, Appl Microbiol Biotechnol 100:5849– 5858, (2016).
9. In situ fabrication of highly crystalline CdS decorated Bi2S3 nanowires (nano-heterostructure) for visible light photocatalyst application, R. Panmand, Y. Sethi, R. Deokar, D. Late, **H. Gholap**, J. Baeg and B. Kale, RSC Adv, 6, 23508-23517, (2016).
10. The interactions between CdTe quantum dots and proteins: Understanding nano bio interface, S. Joglekar, **H. Gholap**, P. Alegaonkar, A. Kale, AIMS Materials Science 4(1): 209-222 (2017).

11. Study to elucidate effect of titanium dioxide nanoparticles on bacterial membrane potential and membrane permeability, M. Khater, G. Kulkarni, S. Khater, **H. Gholap**, R. Patil, Materials Research Express, 7 (3), 035005, (2020).
12. ZnO/CdS Nanocomposite: An Anti-Microbial and Anti-Biofilm Agent, **H. Gholap***, A. Gholap, R Patil, Advances in Microbiology, 10 (4), 166-179, (2020).
13. Comparative studies on measurement of membrane potential of bacterial cells treated with ZnO nanoparticles by Spectrofluorometry, fluorescence microscopy and flowcytometery M. Khater, S. Khater, **H. Gholap**, R. Patil, G. Kulkarni, Journal of Microbiological Methods, Volume 173,105920.
14. Photocatalytic degradation of antibiotics by Titanium Dioxide ($TiO_2$) Nanoparticles, P. Yeole, S. Khater, **H. Gholap** and Maya Khater, ES Energy Environ., **2024**, 26, 1277.

**International Conferences Proceeding:**

1. **H. Gholap**, A. Kale, Synthesis of water soluble Te nanorods and CdTe nanoparticles: The influence of precursors Cd/Te molar ratio, **Proceeding in International Conference on Nanotechnology for Human Welfare (ICNHW- 2018)** at H.V.Desai College, Pune on February 1st-3rd, 2018. (**ISSN: 978-93-87317-98-7**).
2. M. Mamun, A. Pelton, B. Paul, M. Reaz, **H Gholap**, K. Ghosh, Fabrication and characterization of ferroelectric-ferromagnetic heterostructures BZT-BCT/LSMO/LAO using pulsed laser deposition, American Physical Society (APS) Meeting March 2017, Volume 62, Number 4, **March 13–17, 2017** at New Orleans, Louisiana, USA.
3. B. Paul, M. Reaz, M. Mamun, A. Wanekaya, R. Delong, **H.Gholap**, K. Ghosh, Synthesis and characterization of polypeptide-$Co_3O_4$ nano-conjugates, American Physical Society (APS) Meeting March 2017, Volume 62, Number 4, **March 13–17, 2017** at New Orleans, Louisiana, USA.

## Participation in Conferences/Seminars/Symposia/Workshop:

1. Superparamagnetic ($Fe_3O_4$) CdTe (Core) Shell Bifunctional Nanoparticles" MRS Fall Meeting, held at **Boston, Massachusetts, USA during November 30-December 4, 2009**.
2. Magnetic –Fluoroscent nanoparticles for Bioimaging and Bioseparation Applications" International Workshop on Nanotechnology and Advanced Functional Materials (NTAFM) held at **National Chemical Laboratory (NCL) Pune, India during July 9-11, 2009**.
3. Research paper presented as minor research project (**Innovation- 2009)** in regional Conference for Pune University College Teachers, BCUD, University of Pune at New Arts, Commerence and Science College, Ahmednagar on **Dec 9-10, 2009.**

4. National Seminar on **"NANOSCIENCE"** sponsored by University Grant Commission (UGC) G.M.D and B.V Arts, Science and Commerce College, Sinner, Dist. Nashik **Jan 21-23, 2010**.
5. Superparamagnetic ($Fe_3O_4$) CdTe (core) shell Nanoparticles, in Raman Memorial Conference **(RMC-2010)** organized by IPA (Pune Chapter) and Department of Physics, University of Pune-7 during **Feb 24-25, 2010.**
6. Research paper presented as part of minor research project (**Innovation- 2010)** in the regional Conference for Pune University College Teachers, BCUD, University of Pune at H.V Desai College Pune-2 during **November 22-23, 2010.**
7. Research paper presented as a part of National Science day and International year of Chemistry (IYC 2011) National Chemical Laboratory (NCL), Pune on **Feb 24, 2011**.
8. Quantum dot bio-conjugate: as a western blot probe for highly sensitive detection of cellular proteins" in National Chemical Laboratory (NCL) " Science Day" organized by NCL Pune-8 during **Feb 27-28, 2012.**
9. Antiquorum sensing studies of ZnO , ZnO - CdS and ZnO -CdTe nanocomposites in Raman Memorial Conference **(RMC- 2012)** organized by IPA (Pune Chapter) and Department of Physics, University of Pune-7 during **March 2-3, 2012.**
10. Research paper presented as part of minor research project (**Innovation- 2012)** Regional Conference for Pune University College Teachers, BCUD, University of Pune at Bhartiya Jain Sanghtana College Wagholi, Pune d on **March 26-27, 2012.**
11. Bifunctional Nanoparticles based on Semiconductor Quantum Dots: Synthesis & Application" in Raman Memorial Conference **(RMC- 2013)** at Department of Physics, University of Pune in association with IPA, Pune Chapter on **Feb 22-23, 2013.**
12. Advanced Functionality of quantum dots based nanocomposites as quorum sensing inhibitor of biofilm formation" International Conference of Materials for Advanced Technology **(ICMAT-2013),** held at Suntech, Singapore during June **30-July 5, 2013**.
13. CdTe-$TiO_2$ Nanocomposite: An impeder of Bacterial Growth and Biofilm" International Workshop on Nanotechnology and Advanced Functional Materials **(NTAFM-2013),** held at National Chemical Laboratory (NCL) Pune, India during July **24-25, 2013**.
14. Research paper presented as part of minor research project (**Innovation - 2014)** Regional Conference for Pune University College Teachers, BCUD, University of Pune at H. V. Desai College, Pune on **April 26, 2014.**
15. CdTe quantum dots conjugated zinc oxide nanosheets: An agent impeding microbial growth and biofilm, International Conference on Recent Advances in Nanoscience and

Nanotechnology **(ICRANN)-2014** held at Jawaharlal Nehru University, New Delhi on **December 15-16, 2014**.

16. National Conference on 'Advances in Chemical Sciences with Special References to Molecular spectroscopy, Materials Science and Organic Electronics' **(NCACS-2014)** sponsored by University Grant Commission (UGC), New Delhi at **Department of Chemistry, Fergusson College, Pune-4 on December 19-20, 2014.**
17. Advanced functionality of Au-ZnO nanocomposite as a quorum sensing inhibitor of Biofilm formation, 2nd International Symposium on Physics and Technology of Sensors **(ISPTS-2)** held at YASHDA, Pune on **March 8-10, 2015**.
18. Synthesis, characterization and biological evaluation of CdTe and CdTe/ZnS quantum dots embedded chitosan nanoparticles for their application in bioimaging, in National Symposium on Medical Biophysics (**NSMB-2015**) at **Department of Physics, Savitribai Phule Pune University during September 24-25, 2015.**
19. Research paper presented as part of minor research project (**Innovation - 2015)** Regional Conference for Pune University College Teachers, BCUD, University of Pune at Fergusson College, Pune-4 on **June 17-18, 2015.**
20. Advanced functionality of ZnO/CdS nanocomposite for inhibition of quorum sensing mediated bacterial biofilm formation, International Conference on Nanoscience and Technology **(ICONSAT 2016)** at IISER, Pune during **Feb 29-March 2, 2016.**
21. Stable p-type conductivity in B and N co-doped ZnO epitaxial thin film by PLD, in National Conference on Advanced materials and Applications (**NCAMA-2016**) at Fergusson College, Pune during **March 4-5, 2016.**
22. Nanocomposite g-C3N4/CdSe as an Anti Quorum-Sensing Molecule in *Candida albicans* Biofilm, The **National Academy of Sciences, India (NASI), 87th Annual Session of NASI** & Symposium on "Basic Research- Its Role in National Development" at SPPU, Pune on **December 8-10, 2017.**
23. Synthesis of water soluble Te nanorods and CdTe nanoparticles: The influence of precursors Cd/Te molar ratio, (International Conference on Nanotechnology for Human Welfare (**ICNHW-2018**) at
    H.V. Desai College, Pune during **Feb 1-3, 2018.**
24. Participated in workshop on "Startup Prospects in On the Job training and Internships" organized Research Park Foundation, Savitribai Phule Pune University, Pune on **January 16, 2024**.
24. Participated in conference on "Careers in Science & Technology 2024 organized by S & T digitals at IISER, Pune on **February 3, 4 2024**.

25. Research paper presented in International Conference on Current Trends in Physics and Photonics (ICCTPP) at Department of Physics, MIT World Peace University, Kothrud, Pune during **July 9-11, 2024**.
26. Research paper presented in 4th International Conference on "Global Trends in sustainable technology and its application in Applied Sciences" on 24th and 25th of October 2024 Organized by REVA University in collaboration with INTI University, Bangalore during **October 24-25,2024**. (**Best oral paper award**).
27. Invited talk given on" Ag/g-$C_3N4$ nanocomposite for antibiofilm: An experimental and density functional theory (DFT) studies at International Conference on "Advances in Nanomaterials and Nanotechnology" (ICANN – 2025) Organized by the Department of Physics, Rajdhani College, University of Delhi, New Delhi 110015 Venue: Auditorium, Rajdhani College, University of Delhi during March 5-6,2025.

## Events Organized/Coordinated:

| Sr. No. | Name of the Event | Name of organizing Institute/ College/ University | Nature of contribution | Dates |
|---|---|---|---|---|
| 1. | National Conference on Advanced Materials and Applications (NCAMA-2016) | Department of Physics, Fergusson College with the support from BCUD, Savitribai Phule Pune University and Department of Biotechnology (DBT), Govt. of India | Member | 4th & 5th March 2016 |
| 2. | Hands on training Course : Introduction to Nanomaterials and Nanoscience | Department of Physics, Fergusson College under DBT-STAR College Scheme | Course co-ordinator | 18th December 2014to 27th December 2014 |
| 3. | Lecture Workshop on "Nanotechnology: Energy & Health" held at | Fergusson College, Pune Sponsored by three Science Academies' (Bangalore, Allahabad, Delhi) | Co-ordinator | October 10-11, 2014 |
| 3. | Vedic Science and Technology Day | jointly organized by Deccan Education Society, Pune & FROST Pradnya Vikas Shikshan Sanstha, Pune | Member | January 10th & 11th 2014 |
| 4. | Innovation- 2015 | Fergusson College, Pune | Organizing committee Member | June 17-18, 2015 |
| 5. | National Conference on "Ancient Science and Technology: Retrospection and Aspiration (ASTRA-2015) | Fergusson College, Pune | Member | January 10th & 11th 2015 |
| 6. | Magical Nanoworld | Fergusson College Pune | Course Coordinator | Feb 9, 2016 |

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| 7. | State Level Elocution Competition-2016 | Students Welfare Board, Savitribai Phule Pune University at Fergusson College, Pune- 4 | Co-ordinator | January 20th , 2016 |
| 8. | One day workshop on NET/SET Examination Guidance for M.Sc Physics Students | Students Welfare Board, Savitribai Phule Pune University (SPPU), Pune | Co-ordinator | Feb 23rd 2016 |
| 9. | One day Girl Students Personality Development Programme | Students Welfare Board, Savitribai Phule Pune University (SPPU), Pune at Fergusson College, Pune-4 | Co-ordinator | August 25th 2015 |
| 10. | Introductory workshop of Quantum Computating | I-Hub Quantum Technology IISER, Pune. | Co-ordinator | January 31st 2025 |

## Additional skills/Activities

Resource Person in workshop/symposia:

1. Orientation Course for **Trained Graduate Teachers in Science** as a Resource Person organized at Jawahar Navodaya Vidyalaya, Pune on **May 8th 2011.**
2. UGC sponsored State Level Workshop on "**Nanotechnology and its applications in Polymaterials and Biomaterials**" held at Department of Physics, New Arts, Commerce and Science College, Shevgaon, Dist. Ahmednagar from 12th to 13th January 2011.
3. Resource Person for taking Scholarship Interviews for B.Sc & M.Sc Physics students sponsored by

   **Malhotra Weikfield Foundation**, Pune on **August 8-9th 2013.**
4. Guest lecture delivered on **"Frontiers in Material Science and Nanomaterials"** for T.Y.B.Sc students at Department of Physics, H.V. Desai College, Pune held on **December 24th 2013.**
5. Guest lecture delivered on**"** Semiconductor Quantum Dots based Nanocomposites for Biomedical Applications" at Centre for Materials for Electronics Technology (C-MET), Pune on **January 31st 2014.**
6. Guest lecture delivered on" Structural and Optical characterization of BN: ZnO and Li, BN: ZnO thin film grown by Pulsed Laser Deposition**"** at Centre for Materials for Electronics Technology (C-MET), Pune on **July 11th 2014.**
7. Resource person for **NET/SET workshop for M.Sc Physics** Students organized by Prof. Ramakrishna More Arts, Commerce & Science College Akurdi, Pune-44 on **January 19th 2015.**

8. Resource person at Center for Centre for Development of Advanced Computing, Pune (CDAC), Panchavati, Pune-411008 on "Density Functional Theory (DFT) as theoretical approach to study Nanomaterials" on **July 12, 2024**.

**Participation in Orientation/ Refresher courses:**

1. **General Orientation Programme**" sponsored by UGC held at UGC-ASC from 27th July to 22th August 2010.
2. UGC sponsored "**Refresher Course in Physics**" held at the Department of physics, University of Pune, Pune from 16th November to 6th December 2010.
3. UGC sponsored "**Refresher Course in Physics**" held at the Department of physics, University of Pune, Pune from 11th November to 1st December 2013.
4. Completed **two week Interdisciplinary Refresher Course** in "ADVANCED RESEARCH METHODOLOGY" from 22 September – 06 October, 2023 under faculty development programme (FDP) at Teaching Learning Centre, Ramanujan College University of Delhi under the aegis of Ministry of education Pandit Madan Mohan Malaviya national mission on teachers and teaching.
5. Completed two week refresher course on **"Materials for energy and sustainability"** organized by IISER Bhopal and Malviya Mission Teacher Training Programme (MM-TTP), Centre for Science and Society (C), IISER Bhopal during November 04-18, 2024.
6. Completed five days Faculty Development Programme (FDP) on **"Python Programming for Data Analysis"** conducted by Electronics and ICT academy, C-DAC, Hyderabad from November 20-24, 2024. This programme was supported by Ministry of Electronics and Information Technology, Govt. of INIDA.
7. Completed five days Faculty Development Programme (FDP) on **"Fundamentals of Machine Learning"** conducted by Electronics and ICT academy, C-DAC, Hyderabad from December 20-24, 2024. This programme was supported by Ministry of Electronics and Information Technology, Govt. of INIDA.
8. Completed five days Faculty Development Programme (FDP) on **"Fundamentals of Blockchain"** conducted by Electronics and ICT academy, C-DAC, Hyderabad from January 20-24, 2025. This programme was supported by Ministry of Electronics and Information Technology, Govt. of INIDA.

**Date: 4th March 2025** **(Dr.) Haribhau Gholap**
**Place: Pune**