

International Summer School- Manipal University Jaipur [ISSMUJ]-2024

[Hybrid Mode]



Course Overview

Name of Course- Research Impact: From Planning to Publishing

Name of Instructor: Dr. Shikha Awasthi

Session: June-July 2024

Language of instruction: English

Number of contact hours: 36

Credit awarded: 03

Pre-requisite: *(write NA if no pre-requisite required)*

Objective of Course/Project

1. Introduction to Research
2. Planning and Getting Novel Ideas
3. Fundamentals of Scientific Writing
4. High-impact Publishing
5. Beyond the Scientific Articles: PowerPoint Presentations, Thesis, Grants Proposals

Syllabus:

Research: An introduction to the meaning of research, Motivation in research, Significance of research, Criteria of good research, Problems encountered by researchers in India. **Defining the Research**

Problem: What is a research problem? Selecting the problem, Necessity of defining the problem.

Introduction to Effective Scientific Writing: The influence of clear scientific writing, Parts of scientific writing like title, abstract, introduction, materials and methods, results and discussions, conclusions and bibliography, Identifying reasons why clear scientific communication is important for your career advancement, occupation, or field of study, Difference between simple and complex writing, Crafting powerful paragraphs, Connectivity in writing, Writing for better readability.

Impactful Publishing: Authorship and role of authors, Selecting a journal, Submitting your paper, Understanding peer review, Journal decisions, Plagiarism. **Writing and Thinking Beyond the**

Scientific Articles: Skills for PowerPoint presentation, Poster presentation, Thesis writing, and writing impressive proposals for availing research grants.

Organization of Course

| | | |
|-------------------------|--------------------|--|
| Total contact Hours: 36 | | |
| 1st week: | 5 hrs (classes) | 4 hrs (self-study/project) |
| 2nd week: | 5 hrs (classes) | 4 hrs (Mid-term exam/assessment/discussion) |
| 3rd week: | 5 hrs (classes) | 4 hrs (self-study/project) |
| 4 th week: | 5 hrs (Classes) | 4 hrs (End term exam) |

Mode of lectures: Hybrid mode lecture/videos/case study/ discussion/ workshop/ hands-on

Course/Project Plan

| Lecture no. | Topic | Lecture mode | Instructor |
|-------------|---|--------------|--------------------|
| L: 1-3 | Introduction to the meaning of research, Motivation in research | Online | Dr. Shikha Awasthi |
| L: 4-5 | Significance of research, Criteria of good research, Problems encountered by researchers in India | Online | Dr. Shikha Awasthi |
| L: 6-7 | What is a research problem? Selecting the problem | Online | Dr. Shikha Awasthi |
| L: 8-9 | Necessity of defining the problem | Online | Dr. Shikha Awasthi |
| L: 10-11 | The influence of clear scientific writing, Parts of scientific writing like title, abstract, introduction, materials and methods, results and discussions, conclusions and bibliography | Online | Dr. Shikha Awasthi |
| L:12-13 | Identifying reasons why clear scientific communication is important for your career advancement, occupation, or field of study | Online | Dr. Shikha Awasthi |
| L:14-15 | Difference between simple and complex writing, Crafting powerful paragraphs, Connectivity in writing, Writing for better readability | Online | Dr. Shikha Awasthi |
| L: 15-19 | Authorship and role of authors, Selecting a journal, Submitting your paper | Online | Dr. Shikha Awasthi |
| L:20-21 | Understanding peer review | Online | Dr. Shikha Awasthi |
| L: 22-25 | Journal decisions, Plagiarism | Online | Dr. Shikha Awasthi |
| L: 26-30 | Skills for PowerPoint presentation, Poster presentation, Thesis writing | Online | Dr. Shikha Awasthi |
| L: 31-34 | Writing impressive proposals for availing research grants | Online | Dr. Shikha Awasthi |
| L: 35-36 | Conclusions and course summarizations | Online | Dr. Shikha Awasthi |

Brief profile of the instructor with a Photograph

Personal Information:

Dr. Shikha Awasthi

Assistant Professor (Senior Scale)

Department of Chemistry,

Manipal University Jaipur, India

E-mail: shikha.awasthi@jaipur.manipal.edu

awas.shikha2212@gmail.com

Date of Birth: 22/12/1988



Education & Qualifications:

❖ Doctorate:

Institute- IIT Kanpur/Babu Banarasi Das University, Lucknow

Subject: Chemistry

Registered year- 28th March 2016

Thesis submitted- 19th April 2018

Defended- 2nd May 2019

Grade- A

Thesis supervisor: Dr. Chandra Prabha Pandey (BBDU, Lucknow)

Thesis co-supervisor: Dr. Kantesh Balani (IIT Kanpur)

Thesis title: Electrophoretic Deposition of Carbonaceous Reinforcements in Nickel Matrix

Research interests-

- Materials chemistry
- Thin film deposition by electrochemical/electrophoretic deposition
- Corrosion studies of the materials
- Tribological, mechanical, and magnetic characterizations of materials
- Hydrogels and their characterizations for cartilage applications
- Hydroxyapatite coatings on Ti alloys for bone tissue engineering

❖ Post Graduation:

University- M. Sc. in University of Lucknow.

Year-2010

Subjects- Chemistry

Percentage- **73.06%**

❖ Graduation:

University- B. Sc. in University of Lucknow.

Year- 2008



Subjects- Zoology, Botany, Chemistry

Percentage- **74.60%**

❖ **Intermediate:**

College- Lucknow Public Inter College, Lucknow, Uttar Pradesh.

Year- 2005

Subjects- Hindi, English, Physics, Chemistry, Biology.

Percentage- **72.0 %**

❖ **High School:**

College- Lucknow Public Inter College, Lucknow, Uttar Pradesh.

Year-2003

Subjects- Hindi, English, Commerce, Science, Social Science, Mathematics.

Percentage- **68.03 %**

Teaching and Research Experience:

- ❖ Working as **Assistant Professor-Research** in the Department of Chemistry, **Manipal University Jaipur** from 05/02/2024 to till now.
- ❖ Worked as **Assistant Professor (Senior Scale)** in the Department of Chemistry, **Manipal University Jaipur** from 27/01/2023 to 31/01/2024.
- ❖ Worked as **Kothari-Post Doctoral Fellow (DSKPDF)** in the Department of Materials Engineering, **Indian Institute of Science** from 28/02/2020 to 26/01/2023.
- ❖ Worked as **Post-Doctoral Fellow** in the Department of Mechanical Engineering, **Indian Institute of Science** from 10/06/2019 to 27/02/2020.
- ❖ Worked as **CSIR-Senior Research Fellow** in the Department of Material Science and Engineering, **Indian Institute of Technology Kanpur** from 01/04/2017 to 03/05/2019.
- ❖ Worked as **Project Scientist** in the Department of Material Science and Engineering, **Indian Institute of Technology Kanpur** from 05/02/2014 to 31/03/2017.
- ❖ Worked as project assistant from 27/08/2013 to 31/01/2014 in Medicinal Chemistry Department of **CSIR-CIMAP**, Lucknow.
- ❖ Worked as project assistant from 15/03/2011 to 15/03/2013 in Mass Lab, **Sophisticated Analytical and Instrument Facility division, CSIR- Central Drug Research Institute** Lucknow.

Research Grants:

1. A research proposal (PI) titled "**Carbonaceous Allotropes Decorated Nickel-Zinc Composite Coatings with Hierarchical Structure for Aerospace and Automotive Applications**" was submitted to SERB POWER on 25/01/2024.

2. A research proposal (Co-PI) titled “**Advancing Circular Economy: Eco-Friendly Synthesis of Nanobiomagnetic Composites for Industrial Water Remediation**” was submitted to SERB POWER on 31/01/2024.
3. A research proposal (PI) titled “**Developing Double-Layered Theranostic Ferrogels for Orchestration of Articular Cartilage Repair and Diabetic Wound Healing**” was submitted to SERB SURE on 27/11/2023.
4. A research proposal (Co-PI) titled “**Developing Polyacrylamide Hydrogel-Deferoxamine Based Nanocomposites to Target Ferroptosis-Induced Neurodegenerative Diseases**” is approved for MRB seed-grant on 21/09/2023. PI: Dr. Sudarshan Prabhu (Manipal School of Life Sciences, Bengaluru, 3.4 lakhs), Co-PIs: Dr. Shikha Awasthi and Dr. Sarvesh K Pandey (4 lakhs).
5. A research proposal (PI) titled “**Multi-functional surface modifications of hydrogel**” is submitted to CSIR-ASPIRE on 18/04/2023.
6. A research proposal (PI) titled “**Designing of High Strength, Strongly Bonded Hydroxyapatite Nanocomposite Coatings for Bone Repair**” is submitted to DST Rajasthan on 18/09/2023.

Patents:

1. **Shikha Awasthi**, J. K. Gaur, S. K. Pandey, M. S. Bobji and C. Srivastava, “Reinforced Hydrogel, Methods and Applications Thereof”, **Patent published (202241016585)**, 22 July 2022, FER Filled on 10 March 2023.

Book Chapters:

1. **Shikha Awasthi***, S. Dey and S. K. Pandey, Handbook of Functionalized Carbon Nanostructures, Springer Nature, Chapter 28: “Surface Grafting of Carbon Nanostructures”, Accepted (2023).
2. A Srivastava, **Shikha Awasthi**, and S. K. Pandey, Sustainable Materials in Supercapacitors: New Developments in Green Energy Storage, Elsevier, Chapter 15: “Green Supercapacitors in Transportation Systems”, submitted October 2023.

Research Publications (Citations 491, h-index 13, i10-index 19):

1. **Shikha Awasthi***, “Ferrogels towards Nanotheranostics”, **Materials Today Chemistry (IF 7.3)**, Vol. 35 (2024) pp 101877. <https://doi.org/10.1016/j.molliq.2023.123661>.
2. **Shikha Awasthi*** (*corresponding author*) and S. K. Pandey, “Recent Advances in Smart Hydrogels and Carbonaceous Nanoallotropes Composites”, **Applied Materials Today (IF 8.3)**, Vol. 36 (2024) pp 102058. <https://doi.org/10.1016/j.apmt.2024.102058>.
3. **Shikha Awasthi*** (*corresponding author*), Blanca Prior Palomero, A. Srivastava, Sankar Selvaraj and S. K. Pandey, “Nanodiamond-structured Zinc Composite Coatings with Strong Bonding and High Load-bearing Capacity”, **Nanoscale Advances (IF 4.7)**. Vol. 6 (2024) pp 1001-1010. <https://doi.org/10.1039/D3NA00809F>
4. A. Ram Kumar, S. Selvaraj, P. Rajkumar, M. Selvaraj, J. Dhanalakshmi, M. Kumar, S. K.

- Nagarajan, P. Jayaprakash, G. P. Sheeja Mol, **Shikha Awasthi** and S. K. Pandey, “Insights into structural, vibrational, and chemical shift characteristics, solvents impact (polar and nonpolar) on electronic properties and reactive sites, ADMET predictions, and ligand-protein interactions for antiviral drugs safole and isosafrole: An *in-silico* approach”, **Chemical Physics Impact (IF 2.2)**, Vol. 8 (2024) pp 100443. <https://doi.org/10.1016/j.chphi.2023.100443>.
5. A. Ram Kumar, S. Selvaraj, G. P. Sheeja Mol, M. Selvaraj, L. Ilavarasan, S. K. Pandey, P. Jayaprakash, **Shikha Awasthi**, O. Albormani and A. Ravi, “Synthesis, solvent-solute interactions (polar and non-polar), spectroscopic insights, topological aspects, Fukui functions, molecular docking, ADME, and donor-acceptor investigations of 2-(trifluoromethyl)benzimidazole: A promising candidate for antitumor pharmacotherapy”, **Journal of Molecular Liquids (IF 6.0)**, Vol. 393 (2024) pp 123661. <https://doi.org/10.1016/j.molliq.2023.123661>.
 6. **Shikha Awasthi*** (*corresponding author*), S. K. Pandey, J. K. Gaur and C. Srivastava, “**Load Bearing Studies and Interfacial Interactions of Hydroxyapatite Composite Coatings for Bone Tissue Engineering**”, **RSC Materials Chemistry Frontiers (IF 7.0)**, Vol. 6 (2022) pp 3731-3747. <https://doi.org/10.1039/D2QM00898J>.
 7. Jagadeeshanayaka N, **Shikha Awasthi*** (*corresponding author*), Sudhakar C. Jambagi and C. Srivastava, “**Bioactive Surface Modification through Thermally Sprayed Hydroxyapatite Composite Coatings: A Review over Selective Reinforcements**”, **RSC Biomaterials Science (IF 6.6)**, Vol. 10 (2022) pp 2484–2523. <https://doi.org/10.1039/D2BM00039C>.
 8. **Shikha Awasthi*** (*corresponding author*), J. K. Gaur, M. S. Bobji and C. Srivastava, “Nanoparticles Reinforced Polyacrylamide Hydrogel Composites for Clinical Applications: A Review”, **Journal of Materials Science (IF 4.5)**, Vol. 57 (2022) pp 8041–8063. <https://doi.org/10.1007/s10853-022-07146-3>.
 9. **Shikha Awasthi*** (*corresponding author*), J. K. Gaur, S. K. Pandey, M. S. Bobji and C. Srivastava, “High Strength, Strongly Bonded Nanocomposite Hydrogels for Cartilage Repair”, **ACS Applied Materials & Interfaces (IF 9.5)**, Vol. 13 (2021) pp 24505–24523. <https://doi.org/10.1021/acsami.1c05394>.
 10. **Shikha Awasthi*** (*corresponding author*) “**A Review on Hydrogels and Ferrogels for Biomedical Applications**”, **Journal of Minerals, Metals, and Materials (JOM, IF 2.6)**, Vol. 73 (2021) pp 2440–2451. <https://doi.org/10.1007/s11837-021-04734-7>.
 11. **Shikha Awasthi*** (*corresponding author*), S. K. Pandey, E. Arunan and C. Srivastava, “A Review on Hydroxyapatite Coatings for Biomedical Applications: Experimental and Theoretical Perspectives”, **RSC-Journal of Materials Chemistry B (IF 7.0)**, Vol. 9 (2021) pp 228-249. <https://doi.org/10.1039/D0TB02407D>.
 12. **Shikha Awasthi*** (*corresponding author*), Jeet Kumar Gaur, and M. S. Bobji, “Advanced Ferrogels with high Magnetic Response and Wear Resistance Using Carbon Nanotubes,” **Journal of Alloys and Compounds (IF 6.2)**, Vol. 848 (2020) pp. 156259-156269. <https://doi.org/10.1016/j.jallcom.2020.156259>.

13. **Shikha Awasthi**, S. K. Pandey, C. P. Pandey and K. Balani, “Progress in electrochemical and electrophoretic deposition of nickel with carbonaceous allotropes: A Review,” **Advanced Materials Interfaces (IF 5.4)**, Vol. 7 (2019) pp. 1901096-1901129. <https://doi.org/10.1002/admi.201901096>.
14. **Shikha Awasthi**, S. K. Pandey and K. Balani “Tuning the Magnetism and Tribological Behaviour of Electrodeposited Ni/Cu Bi-layer by Selective Reinforcement of Carbon Nanotubes” **Journal of Alloys and Compounds (IF 6.2)**, Vol. 818 (2020) pp. 153287-153299. <https://doi.org/10.1016/j.jallcom.2019.153287>.
15. **Shikha Awasthi**, C. P. Pandey and K. Balani, “Synergistic role of carbonaceous reinforcements on multi-length scale tribology of electrophoretically deposited nickel-boron nitride coatings,” **Materials Research Bulletin (IF 5.4)**, Vol. 99 (2018), pp 61-72. <https://doi.org/10.1016/j.materresbull.2017.10.030>.
16. **Shikha Awasthi**, S. K. Pandey, A. Juyal, C. P. Pandey and K. Balani, “Synergistic effect of carbonaceous reinforcements on microstructural, electrochemical, magnetic and tribological properties of electrophoretically deposited nickel,” **Journal of Alloys & Compounds (IF 6.2)**, Vol. 711 (2017), pp 424-433. <https://doi.org/10.1016/j.jallcom.2017.04.003>.
17. **Shikha Awasthi**, R. Maurya, C. P. Pandey and K. Balani, “Interfacial mechanics carbonaceous reinforcements in electrophoretically deposited nickel coatings,” **Surface and Coatings Technology (IF 5.4)**, Vol. 310 (2017), pp 79-86. <https://doi.org/10.1016/j.surfcoat.2016.12.039>.
18. **Shikha Awasthi**, S. Goel, C. P. Pandey and K. Balani, “Multi-length scale tribology of electrophoretically deposited nickel-diamond coatings,” **Journal of Minerals, Metals, and Materials (JOM, IF 2.5)**, Vol. 69 (2017) pp. 227-235. <https://doi.org/10.1007/s11837-016-2142-4>.
19. **Shikha Awasthi**, V. Pal and S. K. Choudhury, “Effect of surface modifications by abrasive water jet machining and electrophoretic deposition on tribological characterization of Ti6Al4V alloy,” **International Journal of Advanced Manufacturing Technology (IF 3.4)**, Vol. 96 (2018) pp. 1769-1777. <https://doi.org/10.1007/s00170-017-1164-6>.
20. V. Pal, **Shikha Awasthi**, (equally contributed as first author), S. K. Choudhury and Kantesh Balani, “Hydrophobicity and tribology of large area textured Cu with nanogrown CuO,” **Surface Innovations (IF 3.5)**, Vol. 4 (2016) pp. 205-213. <https://doi.org/10.1680/jsuin.16.00016>.
21. S. Kanhed, **Shikha Awasthi** (equally contributed as first author), Swati Midha, J.Nair, A. Nisar, A. K. Patel, A. Pandey, R. Sharma, S. Goel, A. Upadhyaya, S. Ghosh, and K. Balani “Microporous hydroxyapatite ceramic composites as tissue engineering scaffolds: an experimental and computational study,” **Advanced Engineering Materials (IF 4.12)**, Vol. 20 (2018) pp. 1701062-1701073. <https://doi.org/10.1002/adem.201701062>.
22. P. Shukla, **Shikha Awasthi**, J. Ramkumar and K. Balani, “Protective Trivalent Cr-Based

Electrochemical Coatings for Gun Barrels” **Journal of Alloys & Compounds (IF 6.2)**, Vol. 768 (2018) pp. 1039-1048. <https://doi.org/10.1016/j.jallcom.2018.07.170>.

23. S. Kanhed, **Shikha Awasthi**, S. Goel, A. Pandey, R. Sharma, A. Upadhyaya and K. Balani, “Porosity distribution affecting mechanical and biological behaviour of hydroxyapatite bioceramic composites,” **Ceramics International (IF 5.2)**, Vol. 43 (2017) pp. 10442-10449. <https://doi.org/10.1016/j.ceramint.2017.05.083>.
24. S. Dubey, **Shikha Awasthi**, A. Nisar and K. Balani, “Role of Interfaces in Damage Initiation and Tolerance of Carbon Nanotube-Reinforced HfB₂-ZrB₂ Ceramics”, **Journal of Minerals, Metals, and Materials (JOM, IF 2.5)**, Vol. 72 (2020) pp. 2207-2218. <https://doi.org/10.1007/s11837-020-04164-x>.
25. K. Singh, A. Kumar, **Shikha Awasthi** and S. K. Pandey, P. Mishra, “Adsorption Mechanism of Carboxymethyl Cellulose onto Mesoporous Mustard Carbon: Experimental and Theoretical Aspects”, **Colloids and Surface A: Physicochemical and Engineering Aspect (IF 5.2)**, Vol. 581 (2019) pp. 123786-123802. <https://doi.org/10.1016/j.colsurfa.2019.123786>.
26. K. Singh, A. Kumar, S. K. Pandey, **Shikha Awasthi**, S. P. Gupta and P. Mishra, “Interpretation of Adsorption Behaviour of Carboxymethyl Cellulose onto Functionalized Accurel Polymeric Surface”, **ACS Industrial and Engineering Chemistry Research (IF 4.2)**, Vol. 59 (2020) pp. 19102–19116. <https://doi.org/10.1021/acs.iecr.0c03894>.
27. Sayed Hasan Mehdi, Raza Murad Ghalib, **Shikha Awasthi** (equally contributed as first author), S. F. Alshahateet, R. Hashim, O. Sulaiman, S. K. Pandey, “Synthesis, Characterization, Crystal Structure, and Stability of 2-(5, 5-dimethyl-3-oxocyclohex-1-en-1-yl) Hydrazinecarbothioamide: A Combined Experimental and Theoretical Study,” **ChemistrySELECT (IF 2.1)**, Vol. 2 (2017) pp. 6699-6709. <https://doi.org/10.1002/slct.201700799>.
28. S. K. Pandey, M. F. Khan, **Shikha Awasthi**, R. Sangwan and S. Jain, “A Quantum Theory of Atoms-in-Molecules Perspective and DFT Study of Two Natural Products: Trans-Communic Acid and Imbricatolic Acid,” **Australian Journal of Chemistry (IF 1.1)**, Vol. 70 (2016) pp. 328-337. <https://doi.org/10.1071/CH16406>.
29. Pankaj K. Tripathi, **Shikha Awasthi**, Sanjeev Kanojiya, Vineeta Tripathi, Dipak K. Mishra, “Callus culture and in vitro biosynthesis of cardiac glycosides from *Calotropis gigantea*,” **In Vitro Cell. Dev. Biol.-Plant (IF 2.6)**, Vol. 49 (2013) pp. 455-460. <https://doi.org/10.1007/s11627-012-9481-9>.

Research Publications (Submitted/under process):

1. **Shikha Awasthi*** (corresponding author), S. K. Pandey, H. J. Shwetha and J. K. Gaur, “Silver and Hydroxylated Boron Nitride Reinforced Tough Hydrogel Composite for Soft Tissue Regeneration”, Revision received from **ACS Applied Polymer Materials (IF 5)**.
2. **Shikha Awasthi*** S. Dey and S. K. Pandey, “Electrodeposited Carbon Nanostructured Nickel Composite Coatings: A Review”, Revision submitted in **Heliyon (IF 4)**, September 2023.

3. **Shikha Awasthi***, S. Dey and S. K. Pandey. "Advanced Techniques for Materials Characterizations", Under review in **ACS Omega (IF 4.1)**, December 2023.
4. Aarcha Appu Mini, Arghya Chakravorty, Sudip Das, **Shikha Awasthi**, Andrews Nirmla Grace and Sarvesh Kumar Pandey, "CuO Nanoparticles Passivated 2D MXene-based Voltammetric Sensor for Detecting Environmental Hazardous Pollutant", Submitted in **Ceramics International (IF 5.2)**, January 2024.
5. **Shikha Awasthi***, et al. "Ag₂S Quantum Dots Embedded in Molecular Imprinted Polymer Matrix with High Photocatalytic Activity for Dye Removal", Submitted in **Chemical Engineering Journal (IF 15.1)**, September 2023.
6. **Shikha Awasthi***, et al. "Hydrothermally Synthesized PbS Doped Bismuth Titanate Perovskites as Highly Photocatalyst for Hydrogen Production", Submitted in **International Journal of Hydrogen Energy (IF 7.2)**, December 2023.
7. **Shikha Awasthi***, P. Dawar and S. Dey, "Double-layered Hydrogels for Cartilage Regeneration", under preparation for the invitation received from the journal **Materials Advances (IF 5)**.
8. **Shikha Awasthi*** and M. Sachdeva, "Surface Treatment of Hydrogels for Biomedical Applications", under preparation.
9. **Shikha Awasthi***, A. Srivastava and S. K. Pandey, "Zinc Based Biocomposite Coatings", under preparation.
10. **Shikha Awasthi*** et al. "Multi-layered Structures of Hydrogels for Clinical Applications", under preparation.
11. **Shikha Awasthi*** et al. "Translational Applications of Magnetic Nanocellulose Composites", under preparation.
12. **Shikha Awasthi*** et al. "Designing of Zinc-hydroxyapatite Coatings for Clinical Applications", under preparation.
13. **Shikha Awasthi*** et al. "Preparation and Characterizations of Zinc-hexagonal Boron Nitride Coatings", under preparation.

Teaching Experience:

B.Sc.

CY1205 Stereochemistry and Reaction Mechanisms

CY2104 Main Group Elements II and Introduction to Group Theory

B.Tech.

CY1001 Engineering Chemistry

Labs

CY6231 Advanced Chemistry Laboratory (M.Sc.)

CY3133 Chemistry Lab V (B.Sc.)

CY1030 Engineering Chemistry Lab (B.Tech.)

Seminar and Conferences:

(Paper presented in International: 7 National: 3)

1. Oral presentation (**Invited**) in Webinar on Materials Technology and Nanotechnology, October 23, 2020, Meetings International, Singapore.
2. Paper presented on the theme Frontier in Young Scientist Conference as a part of Indian International Science Festival-2019 on November 5-8, 2019, Biswa Bangla Convention Centre, Kolkata, India.
3. Oral presentation (**Best Oral Presentation Award**) in Global Conference on the Control of Green House Gasses at the Source by Physical and Chemical Technology (GCGHGSPCT), April 22-24, 2019, BBAU Lucknow, India.
4. Oral presentation in National Conference on Chemical Sciences: Advancing Frontiers, March 15-16, 2019 at Department of Chemistry, University of Lucknow, India.
5. Oral presentation (**Invited**) in Young scientist Category in International Symposium on Advances in Functional & Biological Materials, February 28, 2019, Humboldt Academy, Lucknow and University of Lucknow, India.
6. Oral presentation in ISCB International Conference, January 12-14, 2019, CSIR-CDRI Lucknow, India
7. Oral presentation (**Invited**) in International Conference on Chemical Science: National and Global Prospective, October 29-31, 2018, at Lucknow Christian College, Lucknow, India.
8. Poster presentation in International conference on Materials Engineering (ICME), June 2-4, 2017, IIT, Kanpur, India.
9. Poster presentation in NMD-ATM, 2016, 54th National Metallurgist Day and 70th Annual Technical Meeting, November 11-14, 2016, IIT, Kanpur, India.
10. Presented poster in National Symposium on Innovative methods in Chemistry Education organized by Department of Chemistry, University of Lucknow on 8-10 Oct 2015 (**Best Poster**).
11. Participated in Summer Radio Workshop organized by Media Technology Centre, IIT Kanpur on 20-25 May 2014.
12. Participated in Seminar on Organometallic Chemistry organized by Special Assistance Program (UGC) and Department of Chemistry, University of Chemistry on March 31, 2010.
13. Participated In Seminar on DIABETES in Endocrinology dept., S.G.P.G.I.M.S, Lucknow on February 22-23, 2003.
14. Participated in Five Days International Course on Novel Exploration in Research Writing, October 12-16, 2020, Department of Chemistry, PSNA College of Engineering and Technology, Dindigul, India.
15. Participated in National Webinar on National Education Policy: Features and Prospects in Higher Education, September 14, 2020, Department of Chemistry, Dr. Harisingh Gour University in Collaboration with Bharatiya Shikshan Mandal, Mahakoshal Praant, India.

16. Participated in National Webinar on Instrumental Techniques and their Applications in Chemistry, August 25, 2020, Department of Chemistry, Government P. G. College, Datia in Collaboration with Higher Education Government of M. P, Bhopal, India.
17. Participated in the National Level Online Quiz on Recent Trends in Chemistry, August 1, 2020, Seshasayee Institute of Technology, Trichy, India.
18. Participated in the National Level Online Quiz on The Cherishable Wisdom of Chemistry, July 21, 2020, Dayanand Anglo-Vedic College, Kanpur, India.
19. Participated in the two days international e-seminar on Chemistry, Biology and Covid 19, June 25-26, 2020, University of Lucknow, Lucknow, India.
20. Participated in Tenth National Frontier of Engineering Symposium held at Department of Material Science and Engineering, IIT Kanpur on 23-25 June, 2016.
21. Participated in National Seminar on Ancient India Science and Technology held at IIT Kanpur on 14th Oct 2015.

Reviewer of the Journals:

1. Reviewed manuscript from Journal of Materials Science (Springer) on 01 January 2024.
2. Reviewed manuscript from Universal Journal of Materials Science on December 07, 2023.
3. Reviewed manuscript from Materials Research Express (IOP) on November 16, 2023.
4. Reviewed manuscript from Universal Journal of Materials Science on September 14, 2023.
5. Reviewed manuscript from Universal Journal of Materials Science on August 24, 2023.
6. Reviewed manuscript from Journal of Materials Science (Springer Nature) on December 05, 2022.
7. Reviewed manuscript from Journal Coatings (MDPI) on November 04, 2022.
8. Reviewed manuscript from Journal Cogent Engineering (Taylor & Francis) on July 11, 2022.
9. Reviewed manuscript from Journal Lubricants (MDPI) on May 24, 2022.
10. Reviewed manuscript from Journal Membranes (MDPI) on April 15, 2022.
11. Reviewed manuscript from Journal Lubricants (MDPI) on March 08, 2022.
12. Reviewed manuscript from Journal Materials (MDPI) on February 06, 2022.
13. Reviewed manuscript from Journal Gels (MDPI) on November 23, 2021.
14. Reviewed manuscript from The 10th Global Conference on Materials Science and Engineering (CMSE 2021) on April 06, 2021.
15. Reviewed manuscript from International Journal of Magnetics and Electromagnetism on March 25, 2021.
16. Reviewed manuscript from Universal Journal of Materials Science on December 31, 2020.
17. Reviewed manuscript from Chinese Physics Letter on December 01, 2020.

18. Reviewed manuscript from World Journal of Engineering on November 19, 2020.
19. Reviewed manuscript from RSC Materials Advances on October 23, 2020.
20. Reviewed manuscript from RSC Analytical Methods on August 22, 2020.
21. Reviewed manuscript from Journal of Alloys and Compounds on July 8, 2019.
22. Reviewer of Universal Journal of Materials Science (Horizon Research Publishing, USA).
23. Reviewed manuscript from Journal Materialia on December 10, 2019.

Extracurricular Activities:

1. Received certificate from Manchester University for the online course (Coursera) ‘Introduction to Molecular Spectroscopy’, September 2023.
2. Received certificate from University of Hong Kong for the online course (Coursera) ‘Materials in Oral Health, September 2023.
3. Received certificate from University of California for the online course (Coursera) ‘Writing Skills for University Success, September 2023.
4. Alumni Coordinator for the academic year 2023-2025 at Manipal University Jaipur.
5. Laboratory In-Charge for the academic year 2023-2025 at Manipal University Jaipur.
6. B.Sc. 3rd year coordinator for the academic year 2023-2025 at Manipal University Jaipur.
7. Anti-ragging committee member August-September 2023 at Manipal University Jaipur.
8. Admission committee member January-May 2023 at Manipal University Jaipur.
9. Organized a summer camp on 11th May 2023 at Manipal University Jaipur.
10. Worked as a Volunteer in the International conference on Materials Engineering (ICME), June 2-4, 2017, IIT Kanpur, India
11. Worked as a Buddy, Counselling Service, PG Wing IIT Kanpur 2016-17
12. Worked as a Mentor, Counselling Service, PG Wing IIT Kanpur 2015-2016.
13. Worked as Orientation Team Member, Counselling Service, PG Wing IIT Kanpur 2014-2015.
14. Worked as a Volunteer of Hall day of the Hall-7, IIT Kanpur during 2012-2013.

Membership:

1. Joined as a MEMBER (Membership No-559593) of the TMS—The Minerals, Metals & Materials Society from 30/06/2020.
2. Joined as a LIFE MEMBER (Membership No-RULE015) of the World Research Council from 03/01/2019.
3. Joined as a LIFE MEMBER (Membership No-1773) of the Association of Chemistry Teachers from 23/11/2015.

4. Joined as a LIFE MEMBER (Membership No-LF-881/2018) of the Association Indian Society of Chemists and Biologists from 09/07/2018.
5. Joined as a LIFE MEMBER (Membership No-L30308) of the Indian Science Congress from 15/07/2019.

Awards, Scholarships and Medals:

1. Selected for SERB National Post-Doctorate Fellowship (**N-PDF**).
2. Selected for Kothari Post-Doctorate Fellowship (**DSKPDF**).
3. **Best Oral Presentation Award** in a Global Conference on the Control of Green House Gasses at the Source by Physical and Chemical Technology (GCGHGSPCT), April 22-24, 2019, BBAU Lucknow, India.
4. **Best Researcher in Surface Engineering Award** by RULA (Research Under Literal Access) International awards 2019, Powered by World Research Council for the excellence in research work of "Protective trivalent Cr-based electrochemical coatings for gun barrels (Journal of Alloys & Compounds) on 26th February, 2019.
5. **Young Scientist Award** in International Conference on Chemical Science: National and Global Prospective on 29-31 October, 2018 at Lucknow Christian College, Lucknow.
6. **CSIR-SRF** from 1st April, 2017 to 31st March 2019.
7. **Bharat Jyoti Award** for Meritorious Services, Outstanding Performance and Remarkable role given by Dr. Bishma Narain Singh (Former Governor of Tamilnadu and Assam), organised by Indian International Friendship Society at New Delhi on 9th June 2016.
8. **1st prize in Best Poster Award** in national symposium on "Innovative Methods in Chemistry Education", in University of Lucknow (2015).
9. Received Letter of Intent by Jubliant Chemsys Limited, Noida as Trainee Research Associate on July 1, 2010.
10. Achieved silver medal in B.Sc. II Year, having overall second rank (2007).
11. Topper in first semester of M.Sc (University of Lucknow) and overall second topper.

Achievements in News:

- A research highlight on the work related to **Cartilage Repair (ACS Applied Materials & Interfaces)** was published by Dainik Jagran, Lucknow on 3rd March 2022.
- A research highlight on the work related to **Cartilage Repair (ACS Applied Materials & Interfaces)** was published by Times of India, Bangalore on 16th August 2021 (<https://timesofindia.indiatimes.com/city/bengaluru/researchers-develop-hybrid-hydrogels-to-repair-cartilage/articleshow/85354437.cms>).
- An interview related to research on cartilage replacement material was published by ETV Bharat news channel on 31st July 2021 (<https://www.etvbharat.com/english/bharat/iisc-develop-high-strength-hydrogels-for-cartilage-repair/na20210731101743882>).

- A research highlight on the work related to ***Cartilage Repair (ACS Applied Materials & Interfaces)*** was published by IISc News on IISc main website on 20th July 2021 (<https://iisc.ac.in/cartilage-repair-using-high-strength-hydrogels/>).
- A short biography was published by Hindi newspaper Dainik Jagran, Ambedkar Nagar (a small district in Uttar Pradesh) on 28th February 2021 for outstanding research activities.
- A detailed solo biography was published by Hindi newspaper Dainik Jagran, Ambedkar Nagar (a small district in Uttar Pradesh) on 17th October 2020 for outstanding research activities.
- **Awareness thoughts** on Covid-19 were published by Hindi newspaper Dainik Jagran, Lucknow and Ambedkar Nagar (a small district in Uttar Pradesh) on 2nd September 2020.
- **Young Scientist Award** was published by Hindi newspaper Dainik Jagran (Ambedkar Nagar district, India) on 7th November 2018.
- **Bharat Jyoti Award** was published by Hindi newspaper Dainik Jagran (Ambedkar Nagar and Lucknow district, India) on 7th and 8th June, 2016.
- **Trainee Research Associate**, placed directly from M.Sc. (Lucknow University) was published by Hindi newspaper ‘‘i-next’’ on March 09, 2010.