

Dr. PRABHAT KUMAR PATEL

Ph.D. (Centre for the Environment)
Indian Institute of Technology Guwahati

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EDUCATIONAL QUALIFICATIONS

DEGREE	INSTITUTE/UNIVERSITY	CGPA/%	YEAR OF PASSING
Ph.D. (Centre for the Environment)	Indian Institute of Technology Guwahati	-	2023
M.Tech (Environmental Engineering)	Motilal Nehru National Institute of Technology, Allahabad (Prayagraj)	8.65	2017
B. Tech (Civil Engineering)	Noida Institute of Engineering and Technology, Gr. Noida	81.2	2014
Higher Secondary	Uttar Pradesh Board, UP	65.0	2009
Secondary	Uttar Pradesh Board, UP	78.6	2007

ACADEMIC TRAINING

Analytical Equipment Expertise

- Atomic Absorption Spectroscopy (AAS) (5 years)
- Material Characterization Techniques: XRD, FESEM-EDX, BET, TGA,
- UV-Vis Spectrophotometer (2 years)
- Fourier transform-infrared spectrophotometry (FTIR) (4 years)
- pH Meter, Orbital Shaker Incubator, Laminar Hood, Autoclave, Muffle Furnace, Hot Air Oven and Sonicator

TEACHING PROFICIENCY

	Courses	Labs
UG Core	PG & Electives	
<ul style="list-style-type: none">• Fluid Mechanics• Building Materials and Construction• Environmental Engineering• Surveying• Transportation Engineering• Open Channel Flow	<ul style="list-style-type: none">• Physicochemical Processes in Water and Wastewater Treatment• Air Pollution Control• Solid and Biomedical Waste Management• Design of Water and Wastewater System• Industrial Wastewater Treatment and Reuse• Environmental Impact Assessment	<ul style="list-style-type: none">• Fluid Mechanics Lab• Surveying Lab• Transportation Lab• Geoinformatics Lab• AutoCAD Lab• Environmental Engineering Lab• Building Materials Lab

MENTORING SKILLS

Name of the students	Programme and Tenure	Project
Ayush Verma	M.Tech (2021-2023)	Bacteriological & Physico-Chemical analysis of water quality at Lucknow city
Mrigank Dixit	M.Tech (2021-2023)	Utilization of treated dry sludge for lightweight concrete and the use of treated wastewater as a curing medium
Mohammad Zeeshan Ansari	M.Tech (2021-2023)	Removal of heavy metals from industrial effluents using low cost natural adsorbents
Satyam Saxena	B.Tech (Feb 2018-June 2018)	Design and development of water treatment plant for a township having population of 2 lakh.

Ankit Pandey	M.Tech (Feb 2018-June 2018)	Leachate characteristics and its impact on groundwater quality near municipal solid waste management plant Shivari, Lucknow.
Ankit Kumar	M.Tech (Feb 2018-June 2018)	Vehicular emission at major intersections and roads of Lucknow and dispersion modelling of pollutants.
Tapas Jyoti	Internship (June-July 2019)	Synthesis and characterization of chitosan-TETA derivative.
Neelakshi Gogoi	Internship (June-July 2019)	Synthesis and characterization of chitosan-Melamine derivative

RESEARCH INTERESTS

Doctoral	UG/PG
<ul style="list-style-type: none"> • Synthesis of bio-polymer derivatives • Remediation of dyes, noble metals and heavy metals • Treatment of water and wastewater streams • Synthesis of low-cost adsorbents 	<ul style="list-style-type: none"> • Improvement of road pavements • Synthesis of bio-polymer derivatives • Adsorptive removal of metal ions from wastewater solutions

Work Experience

<ul style="list-style-type: none"> • Working as Assistant Professor at Institute of Engineering and Technology, Lucknow (Present) • Served as Guest Lecturer at Institute of Engineering and Technology, Lucknow (5 Months) • Appointed as student mentor under Rashtriya Avishkar Abhiyan (RAA) (3 Months) • Teaching Assistantship for various courses like Solid Waste Management (6 months), Environmental Engineering (6 months), Air Pollution (6 Months), Surveying lab (6 Months), AutoCAD lab (4 months), WaterCAD lab (6 months), Air Pollution (6 Months) 	<ul style="list-style-type: none"> • Mentoring students in various projects • Editorial Assistant in Books: “Conservation of Biodiversity in the North Eastern States of India” and “Agro and Food Processing Technologies” • Atomic Absorption Spectroscopy (AAS) Teaching Assistant Operator at Centre for the Environment of Indian Institute of Technology Guwahati • Holding group meetings through online platforms • Coordinating online classes and examinations • Coordinating seminars, conferences and workshops
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TOOLS PROFICIENCY

- Oral and Written Communication Tools: Microsoft Word, Excel and PowerPoint, Origin Pro
- Design Software: Design Expert 7.0, AutoCAD 2017, WaterCAD, Edraw Max, Visual MINTEQ 3.0
- Online Teaching and Meeting Platforms: Zoom, Google Meet and Microsoft Teams

FUTURE ADMINISTRATIVE SKILLS

- PhD student representative at department level
- Key member to organize seminars, workshops and conferences
- Encouraging art, holistic views and physical fitness for recreation of student community

PUBLICATIONS

Google Scholar ID: <https://scholar.google.com/citations?user=Fiu9jIAAAAJ&hl=en> (H-index: 3, i10-index: 1)
Scopus ID: <https://www.scopus.com/authid/detail.uri?authorId=57776018400>
Orcid ID: <https://orcid.org/my-orcid?orcid=0000-0002-9001-8516>
LinkedIn ID: <https://www.linkedin.com/in/prabhat-patel-2976ab123/>

International Refereed Journals/Book Chapter

1. **Patel, P.K.**, Pandey, L.M., Uppaluri, R.V.S., 2023. Adsorptive removal of Zn, Fe, and Pb from Zn dominant simulated industrial wastewater solution using polyvinyl alcohol grafted chitosan variant resins. **Chemical Engineering Journal** 459,141563. <https://doi.org/10.1016/j.cej.2023.141563>. (IF:15.1)
2. **Patel, P.K.**, Pandey, L.M., Uppaluri, R.V.S., 2023. Cyclic desorption based efficacy of polyvinyl alcohol-chitosan variant resins for multi heavy-metal removal, **International Journal of Biological Macromolecules** 242, 124812. <https://doi.org/10.1016/j.ijbiomac.2023.124812> (IF: 8.2)

3. **Patel, P.K.**, Pandey, L.M., Uppaluri, R.V.S., 2023 Synthesized carboxymethyl-chitosan variant composites for cyclic adsorption-desorption based removal of Fe, Pb, and Cu. *Chemosphere* 340, 139780. <https://doi.org/10.1016/j.chemosphere.2023.139780> (IF: 8.8)
4. **Patel, P.K.**, Pandey, L.M., Uppaluri, R.V.S., 2024 Highly effective removal of multi-heavy metals from simulated industrial effluent through an adsorption process employing carboxymethyl-chitosan composites. *Environmental Research* 240, 117502. <https://doi.org/10.1016/j.envres.2023.117502> (IF: 8.3)
5. **Patel, P.K.**, Nagireddi, S., Uppaluri, R.V.S., Pandey, L.M., 2022. Batch adsorption characteristics of Dowex Marathon MSA commercial resin for Au (III) removal from synthetic electroless plating solutions. *Materials Today Proceedings* 68, 824–829. <https://doi.org/10.1016/j.matpr.2022.06.258>. (CS: 2.3)
6. **Patel, P.K.**, Pandey, L.M., Uppaluri, R.V.S. Multi-metal Adsorption and Cyclic Desorption Characteristics of Zn⁺² and Cu⁺² Constituting Multi-component Synthetic Wastewater System Using Commercial Resins, D. Deka, S.K. Majumder, M.K. Purkait (Eds.), *Sustainable Environment, Springer Nature*, 2023: pp. 3–27. https://doi.org/10.1007/978-981-19-8464-8_1.
7. **Patel, P.K.**, Pandey, L.M., Uppaluri, R.V.S. Cyclic adsorption-desorption based Cu, Fe, and Pb removal with citric acid-chitosan variant derivatives. *Environmental Pollution (Under Review)* (IF: 8.9)
8. **Patel, P.K.**, Pandey, L.M., Uppaluri, R.V.S. The role of chitosan-citric acid variant derivatives on Zn, Pb, and Fe cyclic adsorption-desorption removal from Zn dominant adsorbate system. *Science of the Total Environment (Under Review)* (IF: 9.8)
9. Patel, Swati, Jena, Sujata, Said, Prashant, Nayak, Prakash, **Patel, P.K.** Characterization of gluten free composite flour from underutilized buckwheat and sprouted Pabelo dal (*Vigna mungo ssp. viridis*) suitable for bakery products. (Under Review) (IF: 1.832)

Conferences and Workshops

1. North-East Research Conclave towards Sustainable Science and Technology (NERC-2022).
2. National conference on Issues and Challenges in Water Treatment and Allied Research for Sustainable Environment (WATER 2020).
3. 49th Annual Convention on Smart Water Management Indian Water Works Association (IWWA- 2017).
4. International Conference on Modelling of Environmental and Water Resources Systems (ICMEWRS-2017).
5. 3rd International Seminar on Sources of Planet Energy, Environmental and disaster Science: Challenges and strategies (SPEEDS-2016).
6. National Workshop on Sustainable Wastewater and Sanitation Management for Rural Areas: Strategies, Issues and Challenges 2015.
7. Indo-US International Conference on Materials & Sustainable Engineering in Chemical and Allied Industry (MSECAI-2022).
8. Workshop on Market scenario in Built Environment- real estate, construction and infrastructure 2014.

ACADEMIC PROJECTS

PhD Thesis Title: Multi Heavy Metal Cyclic Adsorption-Desorption Characteristics of Commercial Resins and Chitosan Derivatives

July 2018-Oct 2023

Prof. Ramagopal V.S. Uppaluri (IIT Guwahati) & Dr. Lalit Mohan Pandey (IIT Guwahati)

Abstract: My PhD research focuses on the adsorptive removal of heavy metals from industrial wastewater systems and the regeneration of resin using simplistic eluents. Chitosan is a bioproduct, which is notable due to meeting all necessary conditions for heavy metals removal such as amine and hydroxyl functional groups. It offers some of the most impressive characteristics, including bioactivity, biodegradability, non-toxicity, antimicrobial activities, high structural strength, and good film-forming qualities. But it is not suitable for acidic wastewater streams. Hence, to make chitosan suitable for acidic conditions, this needs to be modified using techniques such as crosslinking and grafting. Additionally, my research includes the development and application of low-cost chitosan derivatives for the removal of hazardous metal ions present in water and wastewater streams. Understanding the kinetic, equilibrium and adsorption mechanisms forms the gist of my PhD topic. The following objectives have been set for my PhD thesis:

- ✚ Multi-metal adsorption, desorption and cyclic efficacy of commercial Lewatit TP260, Amberlite IRA 120H for complex Zn and Cu based synthetic wastewater solutions.
- ✚ Effect of chitosan molecular weight on the polyvinyl alcohol-chitosan derivative performance attributes (adsorption, desorption and cyclic efficacy) for complex Zn and Cu based synthetic wastewater solutions.

- ✚ Effect of chitosan molecular weight on the citric acid-chitosan derivative performance attributes (adsorption, desorption and cyclic efficacy) for complex Zn and Cu based synthetic wastewater solutions.
- ✚ Effect of chitosan molecular weight on the carboxymethylated chitosan derivative performance attributes (adsorption, desorption and cyclic efficacy) for complex Zn and Cu based synthetic wastewater solutions.
- ✚ Conceptual resin and processing cost analysis for the quantification of suitable cost based benchmarks and identification of best performing resin for the multi-heavy metal ion removal from complex adsorbate systems.

M. Tech Thesis: Removal of chromium (VI) and iron (II) from the wastewater using glutaraldehyde cross-linked chitosan and modified chitosan adsorbents

July 2015-June 2017

Dr. Nekram Rawal (Motilal Nehru National Institute of Technology, Allahabad (Prayagraj))

Abstract: The overall aim of this project is to synthesize and characterize the glutaraldehyde cross-linked chitosan and modified chitosan adsorbents developed for the removal of chromium (VI) and iron (II) from the wastewater and check for its reusability. The specific objectives include:

- ✚ Synthesizing glutaraldehyde crosslinked chitosan and further modification
- ✚ Characterization of prepared adsorbents using various analytical techniques
- ✚ Adsorptive removal of Chromium (VI) and Iron (II) by synthesized adsorbents
- ✚ Optimization of process parameters
- ✚ To study various kinetic and equilibrium models to understand the removal mechanism

B. Tech Project: Mitigation of cracks and potholes from existing road pavements using Asphalt

July 2010-July 2014

Mr. Maan Singh (Noida Institute of Engineering and Technology, Greater Noida)

Abstract: The overall aim of this project was to increase the strength of road pavements to withhold cracking.

- ✚ Characterization and optimization of asphalt.
- ✚ Execution on existing road pavement.

REFERENCES

Prof. Ramagopal V.S. Uppaluri
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DECLARATION

I hereby declare that the information given above is true to the best of my knowledge.

Name: Prabhat Kumar Patel

Date: 20 November 2023

Signature: 

Place: Lucknow