SUJATA MANDAL, Ph.D.
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EDUCATION

- **Ph.D. in Mechanical and Energy Engineering** | 2021
  University of North Texas, Denton, Texas, USA
  Dissertation Topic: "Lignocellulose based Nanobiocomposites for Water Purification"
- **M.S. in Sustainable Energy Systems**
  State University of New York (SUNY) Cortland, New York, USA
- **B.Ed. in Physical Science and Mathematics**
  University of Calcutta, India
- **B.S. in Physics (Major), Mathematics, and Chemistry (Minor)**
  University of Calcutta, India

RESEARCH INTERESTS

Engineering and characterization of advanced composites and nanostructured materials for circular, energy-efficient water purification and resource recovery systems. Development of sustainable, high-performance materials for environmental remediation, precision agriculture, biomedical technologies, energy storage, and resilient infrastructure.

PROFESSIONAL EXPERIENCE

Job Positions

- **Assistant Professor** | Fall 2026–Present
- **Assistant Professor of Instruction** | Fall 2024–Spring 2026
  Ingram School of Engineering, Texas State University, USA
- **Lecturer** | *Fall 2021–Spring 2024*
  Ingram School of Engineering, Texas State University, USA
- **Faculty Fellow** | September 2024–Present
  Translational Health Research Center, Texas State University, USA
- **Research Assistant** | Summer 2020, Summer 2021
  Department of Chemistry, University of North Texas, USA
- **Teaching Fellow** | Spring 2019–Spring 2021
  Department of Mechanical & Energy Engineering, University of North Texas, USA
- **Teaching Assistant** | Fall 2017–Fall 2018

Department of Mechanical & Energy Engineering, University of North Texas, USA

- **Full-Time Visiting Assistant Professor** | July 2016–May 2017
  Department of Physics and Chemistry, State University of New York (SUNY) Onondaga, NY, USA
- **Energy Engineering Intern** | October 2015–May 2016
  Department of Energy–Intertek, Cortland, NY, USA
- **Adjunct Instructor** | January 2015–May 2017
  Department of Chemistry, State University of New York (SUNY) Cortland, NY, USA
- **Environmental & Safety Compliance Intern** | May 2015–August 2015
  Environmental Health and Safety Office, SUNY Cortland, NY, USA
- **Teaching Assistant** | September 2014–December 2014
  Department of Physics, State University of New York (SUNY) Cortland, NY, USA
- **High School Head of Science & Mathematics** | March 2011–August 2014
  Sewhag International School, India
- **Science Coordinator (Physics)** | February 2010–March 2011
  Sanskaar Valley School, India
- **Coordinator (Physics & Mathematics)** | November 2009–February 2010
  Vidyasanskaar International School, India
- **High School Coordinator & Management Representative (MR)** | March 2005–2009
  Ashok Hall Residential School, India
  Note: Served as Management Representative (MR) for ISO-9001 Quality Management System and ISO-14001 Environment Management System.

GRANTS & PROJECT CONTRIBUTIONS

External & Federal Funding

1. **Principal Investigator**, *NSF I-Corps: Translation Potential of an Economically Friendly Water Purifier Using Biobased Nanocomposites* | National Science Foundation (NSF) | **$50,000** (Funded: Dec 2024–Nov 2025).
2. **Co-Principal Investigator**, *Assisting Food Waste Monitoring and Management in Central Texas Rural Communities* | United States Department of Agriculture (USDA) | **$163,000** (Funded: Oct 2024–Dec 2025).
3. **Co-Principal Investigator**, *Multidisciplinary Research and Workforce Development on Fate and Transport of PFAS* | Department of Energy (DOE) | **$3,520,000** (Funded: April 2024–Mar 2027).
4. **Principal Investigator**, *AquaSipWater LLC*| Buda Economic Development Corporation | **$2,500** (Funded: Nov 2024).
5. **Co-Principal Investigator**, *Climate impact on resiliency and safety of in-situ remediation for recalcitrant contaminants* | Department of Energy (DOE) | **$3,50000** (Funded: Jan 2024–Jan 2025).

Proposals Under Review

1. **Principal Investigator**, *NSF TTP-T: Market-Driven Biowaste Nanotechnology for Decentralized Emergency Water Remediation* | National Science Foundation (NSF) | **$1,199,842** (Submitted: May 19, 2026).

Internal & Institutional Funding (Texas State University)

1. **Principal Investigator**, *Agrogel (project name): Sustainable Solution for Smart Agriculture* | The BobCatalyst Innovation Accelerator Program (BIAP) Phase II | **$5,000** (Funded: May 2026–Dec 2026).
2. **Principal Investigator**, *AquaSplash (project name): Smart Nanotech Water Purification* | BobCatalyst Proof of Concept (POC) Grant | **$30,000** (Funded: Jan 2026–Dec 2026).
3. **Principal Investigator**, *Biochar Earth (project name)* | Materials Application Research Center (MARC) | **$11,000** (Funded: Sep 2025–Aug 2026).
4. **Principal Investigator**, *AquaShield (project name): A unique smart packaging solution* | Faculty Innovation Accelerator Program (FIAP) | **$1,000** (Funded: May 2025–Aug 2025).
5. **Principal Investigator**, *Hydrogel (project name): A Smart Investment for Sustainable Agriculture* | Innovation Showcase Award | **$1,000** (IDC Funded: Mar 2025).
6. **Principal Investigator**, *Ecofriendly Nanocomposites for Portable Water Purification (project name)* | Faculty Innovation Accelerator Program (FIAP) | **$11,000** (Funded: Dec 2024–Dec 2025).
7. **Principal Investigator**, *A unique global solution for sustainable agriculture (project name)* | Faculty Innovation Accelerator Program (FIAP) | **$11,000** (Funded: May 2024–April 2025).
8. **Principal Investigator**, *AquaSip (project name)* | New Venture Competition | **$10,000** (Funded: June 2023).
9. **Principal Investigator**, *Guar gum, a versatile polymer to improve human health and water quality* | Translational Health Research Center | **$10,000** (Funded: August 2023–July 2024).
10. **Co-Principal Investigator**, *Health Education, Awareness, and Literacy Through Older Adults Support with Incontinence Supplies* | TXST I-Corps | **$7,800** (Funded: May 2022–April 2023).
11. **Principal Investigator**, *Development of sustainable, affordable, guar gum-based composite adsorbent for the efficient removal of industrial dyes and oil from wastewater* | Ingram School of Engineering | **$2,000** (Funded: June 2022–April 2024).

PUBLICATIONS

Google Scholar Page: https://scholar.google.com/citations?hl=en&user=6plFBTAAAAAJ

Patent Publications

1. **Mandal, S**., et al. (2025). Ecofriendly Skin Safe Absorbent. U.S. Utility Patient Publication. US-

20250276106-A1.

2. **Mandal, S**., et al. (2025). Sustainable Superabsorbent Hydrogels. U.S. Utility Patient Publication. US-20250250212-A1.
3. **Mandal, S**., et al. (2025). Ecofriendly Nanocomposites for Portable Water Purification. U.S. Utility Patient Publication US-20250250441-A1

Patents Pending

1. **Mandal, S**. (2026). Biochar derived from plum biomass. US Utility Non-Provisional Patent Application No. 19/570,68.
2. **Mandal, S**. (2026). Biopolymer- enabled Self cured pervious concrete, Tech ID No. 2026-019
3. **Mandal, S**. (2026). Harnessing Woody biomass for Multifunctional Nano Composites Advanced Filtration with Enhanced Anti-bacterial properties for Industrial Applications, Tech ID No. 2026-001
4. **Mandal, S**. (2025). Biochar - a sustainable solution for soil amendment and water pollution control. US Patent Application No. 63/774,051.
5. **Mandal, S**. (2025). Green synthesis of zinc oxide nanoparticles and application. US Patent Application No. 63/773,996.
6. **Mandal, S**. (2024). Development of Advanced Materials with Superior Energy Density for Supercapacitors. Tech ID No. 2024-006.
7. **Mandal, S**., et al. (2021). Porous and hydrophobic biomass substrate with stabilized silver nanoparticles and uses thereof. Patent filed with the University of North Texas.

Peer-Reviewed Journal Articles

1. Agyemang, P., Mandal, S., & Hwang, S. (2026). Sustainability of biodegradable superabsorbent hydrogels in agriculture. A review: P. Agyemang et al. *Agronomy for Sustainable Development*, *46*(4), 51.
2. Gurav, R., Babatunde, E. O., **Mandal, S**., Gore, A. H., & Bhatia, S. K. (2026). Bamboo biomass-derived biochar for advanced water treatment: A comprehensive review of synthesis routes and perspectives on the removal of emerging contaminants. *Advances in Bamboo Science*, 100245.
3. **Mandal, S**., Shah, K., Morales, D., Kim, D., & Park, C. (2026). Valorization of agro-waste into smart biosorbents: ANOVA and Random Forest-guided removal of hazardous dyes. *Biomass and Bioenergy*, 208, 108820.
4. Gurav, R., Hwang, S., Bhatia, S. K., Kshirsagar, A. D., **Mandal, S**., & Yang, Y. H. (2025). Exopolysaccharide production using pinewood hydrolysate as a substrate. *Biomass Conversion and Biorefinery*, 1-11.
5. **Mandal, S**., Chi, H., Moss, R., Dhital, P., Babatunde, E., Gurav, R., & Hwang, S. (2024). Seed gum-based polysaccharides hydrogels for sustainable agriculture: A review. *International Journal of Biological Macromolecules*, 130339.
6. Gurav, R., **Mandal, S**., Smith, L. M., Shi, S. Q., & Hwang, S. (2023). The potential of self-activated

carbon for adsorptive removal of toxic phenoxyacetic acid herbicide from water. *Chemosphere*, 339, 139715.

7. **Mandal, S**., Hwang, S., Marpu, S. B., Omary, M. A., Prybutok, V., & Shi, S. Q. (2023). Bioinspired Synthesis of Silver Nanoparticles for the Remediation of Toxic Pollutants and Enhanced Antibacterial Activity. *Biomolecules*, 13(7), 1054.
8. Khondoker, M., **Mandal, S.,** Gurav, R., & Hwang, S. (2023). Freshwater shortage, salinity increase, and global food production: A need for sustainable irrigation water desalination—A scoping review. *Earth*, *4*(2), 223-240.
9. **Mandal, S**., Hu, J., & Shi, S. Q. (2022). A Comprehensive Review of Hybrid Supercapacitor from Transition Metal and Industrial Crop Based Activated Carbon for Energy Storage Applications. *Materials Today Communications*, 105207.
10. **Mandal, S**., Hwang, S., & Shi, S. Q. (2022). Guar gum, a low-cost sustainable biopolymer, for wastewater treatment: A review. *International Journal of Biological Macromolecules*.
11. **Mandal, S**., Marpu, S. B., Omary, M. A., Dinulescu, C. C., Prybutok, V., & Shi, S. Q. (2022). Lignocellulosic-Based Activated Carbon-Loaded Silver Nanoparticles and Chitosan for Efficient Removal of Cadmium and Optimization Using Response Surface Methodology. *Materials*, 15(24), 8901.
12. Smith, L. M., **Mandal, S**., Cao, Y., Hu, J., Xia, C., Shi, S. Q., ... & Calderon, J. (2022). Impact of gas concentrations on the self-activation of southern yellow pine during the pyrolysis process. *Biomass Conversion and Biorefinery*, 1-14.
13. **Mandal, S**., Alankar, T., Hughes, R., Marpu, S. B., Omary, M. A., & Shi, S. Q. (2022). Removal of hazardous dyes and waterborne pathogens using a nanoengineered bioadsorbent from hemp–Fabrication, characterization, and performance investigation. *Surfaces and Interfaces*, 29, 101797.
14. **Mandal, S**., Calderon, J., Marpu, S. B., Omary, M. A., & Shi, S. Q. (2021). Mesoporous activated carbon as a green adsorbent for the removal of heavy metals and Congo red: Characterization, adsorption kinetics, and isotherm studies. *Journal of Contaminant Hydrology*, 103869.
15. **Mandal, S**., Marpu, S. B., Hughes, R., Omary, M. A., & Shi, S. Q. (2021). Green synthesis of silver nanoparticles using Cannabis sativa extracts and their anti-bacterial activity. *Green and Sustainable Chemistry*, 11(1), 38-48.
16. **Mandal, S**., & Shi, S. Q. (2020). Agricultural Plants and Their Antimicrobial Activities - A Mini Review. *American Journal of Biomedical Science and Research*, 11(1), ID.001615.
17. Kamras, B. L., Mirzanasiri, N., Korir, D. K., **Mandal, S**., Hariharakumar, S. L., Petros, R. A., ... & Omary, M. A. (2020). Formula-Driven, Size-Tunable Synthesis of PMMA Nanoparticles by Varying Surfactant Concentration. *Materials*, 13(8), 1834.
18. **Mandal, S**., & Shi, S. Q. (2019). Application of nanotechnology in water and wastewater treatment - A short review. *Sustainable Communities Review*, 12(1).
19. Hubbe, M. A., Becheleni, E. M., Lewis, A. E., Peters, E. M., **Mandal, S**., & Shi, S. Q. (2018). Recovery of inorganic compounds from spent alkaline pulping liquor by eutectic freeze crystallization and supporting unit operations: A review. *BioResources*, 13(4), 9180-9219.

Books & Book Chapters

1. Babatunde, E. O., Kim, Y., & **Mandal, S**. (2025). 8 Drop-in Fuel Production. In *Microbial Biofuel: A Sustainable Source of Renewable Energy* (p. 213). Taylor & Francis.

Articles Under Review

1. **Mandal, S**., et al. (2026) Machine Learning based Prediction of Hydrochar Yield from Lignocellulosic Biomass: Experimental Validation with Walnut Feedstocks. Submitted to *Biomass Conversion and Biorefinery*.
2. **Mandal, S**., et al. (2026) Magnetic NanoBiochar-Based Composites for Trichloroethylene (TCE): An Integrated Review of Sources, Environmental Toxicity, and Advanced Remediation Strategies. Submitted to *the Journal of Groundwater for Sustainable Development*.
3. **Mandal, S**., et al. (2025) Pyrolysis-Derived Lignocellulosic Biochar for Pesticide and Pharmaceutical Soil Remediation: A Review. Submitted to *Journal of CLEAN - Soil, Air, Water*.

Articles Under Preparation with students' co-authorship

1. Green Synthesis and Characterization of Nano particles.
2. Density Functional Theory–Assisted Synthesis of Nano-Adsorbents for Optical Property Prediction and Molecular Interaction Analysis
3. Hydrochar Synthesis Characterization and Process Optimization
4. Life Cycle Assessment of Biocomposites for Soil Amendment

TECHNOLOGY TRANSFER & ACTIVE INDUSTRIAL PARTNERSHIP

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1. VISTAR VENTURE PARTNERS LLC: Capital Firm Supporting Entrepreneurs, May 2026
2. TEXSAR (Texas Search and Rescue): Emergency Response, May 2026
3. A.O. SMITH CORPORATION: Water Treatment, June 30, 2025
4. U.S.-Indo Austin Chamber of Commerce, June 2025
5. U.S.-Trade Consult LLC: Bilateral Trade and Business Development Services, May 2025

SEMINARS, PRESENTATIONS, & DEMONSTRATIONS

Panels & Innovation Demonstrations

1. **Panelist:** TXST-Innovation Round Up, SXSW, Austin, TX | March 13, 2026.
2. **Panelist:** Revolutionizing Stormwater and Floodwater Management, SXSW, Austin, TX | March 12, 2025.
3. **Panelist:** TXST Sustainability Panel, SXSW, Austin, TX | March 9, 2025.
4. **Innovation Demonstration:** TXST BobCat Innovation Lab, SXSW, Austin, TX | March 9, 2025.

5. **Innovation Demonstration:** Gel for Sustainable Agriculture, New Veterans Housing, St Louis. Missouri |Feb 2025.
6. **Innovation Demonstration:** TXST New Venture Competition, San Marcos, TX | July 2024.

Conference Presentations

1. Pitch Finalist: AquaSplash (project name)-Fast-Acting Nanotech Water Purification, TechConnect World Innovation Conference & Expo, Raleigh, NC | March 2026.
2. Presenter: "Kenaf-Based Silver Nanoparticles for Antibacterial Activity and Antibiotic-Tetracycline (TCL) Removal from Wastewater," Health Scholar Showcase, TXST| 2026
3. Presenter: The Power of Biochar: Sustainability Meets Human Health, TechConnect World Innovation Conference & Expo, Raleigh, NC | March 2026.
4. Presenter: Guar to the Future: Biodegradable Hydrogels for Clean Water and Sustainable Living, TechConnect World Innovation Conference & Expo, Raleigh, NC | March 2026.
5. Pitch Finalist: AquaSipWater LLC: Portable Water Purification with Nanotech for Crisis Relief, TechConnect World Innovation Conference & Expo, Austin, TX | June 2025.
6. Presenter: Biochar: Bridging Sustainability and Health for a Better Tomorrow, Health Scholar Showcase, TXST| 2025
7. Presenter: Biochar: Enhancing Urban Resilience: Mitigating the Urban Heat Island Effect with Biochar from Biowaste., International Sustainability Conference on Health, Safety, Fire and Environmental Advances, India| 2025
8. Spotlight Showcase: Agrogel (project name) TechConnect World Innovation Challenge, Austin TX |June 2025.
9. Spotlight Pitch Finalist: Design for Eco friendly Nano technology-based purification system (project name) TechConnect World Innovation Conference & Expo, Austin TX | June 2024.
10. Presenter**:** Texas Life Sciences Summit, Austin, TX | April 2024.
11. Spotlight Innovation Showcase: Hydrogel (project name) Defense TechConnect Innovation Challenge Summit, Austin TX |Dec 2024.
12. Presenter: Latest innovations in natural gum-based polymer, Health Scholar Showcase, TXST| 2024
13. Presenter: Biopolymer and Application, 7th Virtual Edition of POLYMERS, PLASTICS and COMPOSITES | March 2023.
14. Presenter, Society of Wood Science and Technology (SWST) Annual International Convention | July 2023
15. Presenter: Guar gum, a versatile natural polymer to improve human health and water quality, Health Scholar Showcase, TXST| 2023
16. Presenter, 53rd Annual Meeting, American Chemical Society, TX DFW | 2021.
17. Presenter, Graduate Research Symposium, UNT | 2021.
18. Presenter, Society of Wood Science and Technology (SWST) Annual International Convention | 2021
19. Presenter, Society of Wood Science and Technology (SWST) Annual International Convention | 2020

20. Presenter, National Meeting-Green Chemistry & the Environment Symposium, American Chemical Society, Annual Meeting | 2020.
21. Presenter, International Water Conference, Norman, OK | September 2019.
22. Track Chair & Presenter, National Decision Sciences Institute, Chicago, IL | November 2018.

Invited Talks & Seminars

1. **Technology Demonstration:** Young Southeast Asian Leaders Institute, Thailand & Philippines | March 31, 2026.
2. **Speaker for Research & Student Exchange Collaboration:** Prince Royal College, Thailand| April 2025.
3. **Seminar Lecturer:** TXST Graduate Seminar ENGR 5100 | Fall 2025.
4. **Seminar Lecturer:** TXST Graduate Seminar ENGR 5100 | Spring 2025.
5. **Speaker:** Water scarcity, access, and sustainability. Rotary Club, Denton, TX | 2021.

TEACHING AND PEDAGOGY EXPERIENCE

Texas State University (Fall 2021–Present)

- **Courses Developed:**
  - Fluid Mechanics - Lab (**ENGR 3380**)
  - Computer Aided Design and Digital Manufacturing - Lab (**MEE 3361**)
  - Engineering Graphics - Lecture and Lab (**ENGR 1304**)
- **Courses Taught:**
  - Fluid Mechanics Lecture and Lab (**ENGR 3380**)
  - Materials Engineering - Lecture (**ENGR 2300**)
  - Material Selection & Manufacturing Processes - Lecture (**MFGE 2332**)
  - Precision & Digital Engineering (**MFGE Lab 2132/2332**)
  - Engineering Graphics Lecture and Lab (**ENGR 1304**)

University of North Texas (Fall 2017–Spring 2021)

- **Courses Developed:**
  - Discover MEE (**MEEN 1000**)
- **Courses Taught as Teaching Fellow/Instructor of Record:**
  - Alternative Energy (**MEEN 4100**)
  - Engineering Data Analysis (**MEEN 2100**)
  - Discover (**MEEN 1000**)
- **Courses Assisted as Graduate Teaching Assistant:**
  - Combustion Science Engineering - Graduate (**MEEN 5330**)

- Combustion Science Engineering - Undergraduate (**MEEN 4330**)
- Thermodynamics (**MEEN 2210**)

State University of New York (SUNY) Onondaga, NY (Fall 2016–Spring 2017)

- **Courses Developed as Full Time Assistant Professor (Visiting):**
  - Electricity & Magnetism (**PHY 205**)
  - General Mechanics Lecture & Lab (**PHY 103**)
- **Courses Taught:**
  - Wave Mechanics - Lecture (**PHY 203**)
  - General Mechanics Lecture & Lab - Honors (**PHY 103**)
  - General Mechanics Lecture & Lab (**PHY 102**)
  - General Mechanics Lecture & Lab (**PHY 101**)

State University of New York (SUNY) Cortland, NY (Spring 2015–Spring 2017)

- **Courses Developed:**
  - Elementary Chemistry Laboratory Curriculum.
- **Courses Taught as Instructor of Record (Adjunct):**
  - General Chemistry-2 (**CHEM 222**)
  - General Chemistry-1 (**CHEM 221**)
  - Elementary Chemistry (**CHEM 122**)
- **Voluntary Teaching Assistant (Physics Dept):**
  - Elementary Electricity **(PHY 106)**
  - Introductory Astronomy **(PHY 150)**

STUDENT ACCOMPLISHMENTS AND MENTORING

Graduate Students Dissertation Committees, TXST

- **Ph.D. Committee Member:**
  1. Eunice Babatunde (Civil Engineering, Spring 2024–Present).
- **M.S. Committee Member / Co-Chair:**
  1. Kindness Etu (2025–2026)
  2. Portia Agyemang (2025–Present)
  3. Eunice Babatunde (Spring 2022–2023)
  4. Marufa Khondoker (Spring 2022–2023)

Student Researchers Mentored

- **Graduate & Undergraduate Research Supervisor, TXST:**

1. Pallavi Jogi, MS (Fall 2025–Present)
2. Komal Shah, MS -Non-Thesis (Summer 2025–Present)
3. Aviyan Dhital, BS (Summer 2026-Present)
4. Everett Rees Eissler, BS (Spring 2026–Present)
5. Ananya Barua, BS (Spring 2026–Present)
6. Denisse Morales, BS (Fall 2024–Present)
7. Olsan Karki, BS (Summer 2025–Present)
8. Aaditya Jha, BS (Fall 2024–Present)
9. Rosie Ruiz, BS (Fall 2025–Spring 2026)
10. Rhiannon Moss, BS (Fall 2024–2025)
11. Carlos Quinto, BS (Fall 2023–2025)
12. Prabin Dhital, BS (Fall 2023–2025)
13. Xaritzy Cadena, BS (Fall 2024-2025)
14. Rachel Cooling, BS (Fall 2024)
15. Abraham Colin, BS (Fall 2024)
16. Noah Richardson, BS (Fall 2024)
17. Sam Utay, BS (Fall 2024)
18. Junior Segura, BS (Fall 2024)
19. Chloe Hinojosa, BS (Fall 2024)

- **International Student Interns**
    1. Yunseo Cha (The Catholic University of Korea), April 2026-July 2026
    2. Seungmin Yu (Jeonbuk National University), April 2026-June 2026
    3. Yoojin Kim (Soongsil University), Oct 2025-Dec 2025
    4. Dongik Kim (Yeungnam University), April 2024-Nov 2024
    5. Yura Kim (Pukyong National University), Oct 2023-Mar 2024
    6. Hyemin Chi (Yonsei University). Mar 2023-July 2023

- **Student Research Fellowships**
    1. Undergraduate Research Fellowship (2026) *Project:* "Engineered Hydrochar for Sustainable Soil Reinforcement and Predictive Stability Modeling in Energy Infrastructure Sites" *Student:* Olsan Karki (BS-ME) | *In Progress*
    2. Undergraduate Research Fellowship (2025) *Project:* "Green Cleanup: Innovating Biochar Adsorbents for Selective Oil Absorption" *Student:* Olsan Karki (BS-ME) | *In Progress*
    3. Quanta Research Fellowship (2025) *Project:* "Biochar-Based Filtration Systems for Industrial Wastewater in the Energy Sector" *Student:* Aaditya Jha (BS-ME) | *In Progress*
    4. Quanta Research Fellowship (2025) *Project:* "Harnessing Biochar and Biopolymers for Sustainable Curing and Energy Efficiency" *Student:* Denisse Morales (BS-CE) | *In Progress*

- **Student Research Awards & Competitions**
    1. *Best Student Abstract Award*, TechConnect World Innovation Conference, Raleigh, NC (2026) Project*:* "EcoSmart Concrete: An Energy-Efficient and Cost-Effective Solution for

Sustainable Construction "Student*:* Denisse Morales (BS-CE)

2. *Third Position*, Pitch Competition, Bobcat Innovation Competition, Star Park (2026) Project*:* "Greensorb, a sustainable solution for oil spill remediation on land" *Student:* Olsan Karki (BS-ME)

- **Student Presentations**

1. Jogi, P. (MS-CE). "Mechanical Behavior of Concrete with Ceramic and Metal Waste Additives," *TechConnect World 2026 Conference*, Raleigh, NC (2026).
2. Jha, A. (BS-ME). "Biochar-Based Filtration Systems for Industrial Wastewater in the Energy Sector," *TechConnect World 2026 Conference*, Raleigh, NC (2026).
3. Karki, O. (BS-ME). "From Waste to Wonder: Tailored Carbon Composites for Next-Level Effluent Purification," *TechConnect World 2026 Conference*, Raleigh, NC (2026).
4. Shah, Q. (MS Engineering Management). "Waste Valorization and AI-driven Optimization for Industrial Application," *TechConnect World 2026 Conference*, Raleigh, NC (2026).
5. Jha, A. (BS-ME). "Biochar Enhanced Filtration Technology for Removing Industrial Pollutants from Energy Sector Wastewater," *STEM Conference* (2026).
6. Morales, D. (BS-CE). "Energy-Efficient Biochar-Based Sustainable Concrete for Enhanced Curing and Performance," *STEM Conference* (2026).
7. Karki, O. (BS-ME) & Pantoja, J. (BS-CE). "Transforming Waste into Solutions: Modified Avocado Biochar for Dye and Pb (II) Removal," *STEM Symposium* (2026).
8. Barua, A. (BS-CE). "Green Synthesis of Silver Nanoparticles Using Citrus Fruit Peels," *Research Conference* (2026).
9. Moss, R. (BS-CE). "Application of Biochar for Protecting Human Health and the Environment," *Research Symposium* (2024).
10. Dhital, P. (BS-IE), Dangol, P. (BS-CE), & Kim, Y. (BS-Chem Eng). "Sustainable low-cost adsorbent for efficient removal of toxic dye," Poster Presentation, Undergraduate *Research Conference* (2024).

- **Co-Authored Student Publications**

1. Mandal, S., **Shah, K., Morales, D., Kim, D., & Park, C.** (2026). Valorization of agro-waste into smart biosorbents: ANOVA and Random Forest-guided removal of hazardous dyes. *Biomass and Bioenergy*, 208, 108820.
2. **Babatunde, E. O., Kim, Y**., & Mandal, S. (2025). 8 Drop-in Fuel Production. *Microbial Biofuel: A Sustainable Source of Renewable Energy*, 213.
3. Mandal, S., **Chi, H., Moss, R., Dhital, P., Babatunde, E**., Gurav, R., & Hwang, S. (2024). Seed gum-based polysaccharides hydrogels for sustainable agriculture: A review. *International Journal of Biological Macromolecules*, 130339.
4. **Khondoker, M**., Mandal, S., Gurav, R., & Hwang, S. (2023). Freshwater shortage, salinity increase, and global food production: A need for sustainable irrigation water

desalination—A scoping review. *Earth*, *4*(2), 223-240.

PROFESSIONAL ACTIVITIES AND SERVICES

Institutional Service – Texas State University

1. PhD Dissertation Committee Member, Ingram School | Spring 2024–Present.
2. MS Dissertation Committee Member, Ingram School | Spring 2022–Present.
3. Civil Engineering MS - Curriculum Development Team Member | Sep 2024–Fall 2025.
4. Rising Doctoral Institute Committee Member for New Engineering PhD Students | Fall 2024–Present.
5. Graduate Student Recruiting Committee, Ingram School | Sep 2024–Present.
6. Advising Undergraduate CE Students | Fall 2024–Present.
7. Assisted in CIM Course Revision - CE 4100, CE 4200 & CE 4300 | Spring 2026.
8. Library Liaison - Ingram School | Fall 2024–Present.
9. Faculty Fellow - Translational Health Research Center | Fall 2024–Present.
10. Interdisciplinary Conference Judge, Texas Academy of Mathematics and Science (TAMS) | 2020.

Editorial and Review Activities

A. **Guest Editor:** *Gels* - MDPI. Special Issue Focus | October 2024–Present.

B. **Editorial Board Member:** *International Journal of Materials Science and Applications* | 2021.

C. **Reviewer for Flagship Journals:**
   1. *BMC Chemistry*, Springer Nature | May 2026
   2. *Discover Nano*, Springer Nature | May 2026
   3. *BioNanoscience*, Springer Nature | Jan 25, 2026
   4. *Scientific Reports*, Springer Nature | Jan 25, 2026
   5. *Cellulose*, Springer Nature | Jan 2026
   6. *Cellulose*, Springer Nature | May 13, 2025
   7. *Water, Air, & Soil Pollution*, Springer Nature | Sep 21, 2025
   8. *Polymer Bulletin*, Springer Nature | July 2025
   9. *Water Conservation Science and Engineering*, Springer Nature | Jan 2025
   10. *Scientific Reports*, Springer Nature | Sep 2024
   11. *Water Conservation Science and Engineering*, Springer Nature | Oct 2024
   12. *Wood Science and Technology*, Springer Nature | July 2024
   13. *Research on Chemical Intermediates*, Springer Nature | March 2024
   14. *Journal of Cleaner Production*, Springer Nature | Feb 2024
   15. *Biomass Conversion and Biorefinery*, Springer Nature | June 2024
   16. *Advanced Composites and Hybrid Materials*, Springer Nature | June 2023

17. *Advanced Materials*, Springer Nature | Sep 2023
18. *Advanced Materials*, Springer Nature | April 2023
19. *Journal of Cleaner Production*, Springer Nature | April 2023
20. *Biomass Conversion and Bioenergy*, Springer Nature | Jan 2023
21. *Journal of Molecular Liquids*, Springer Nature | Nov 2022
22. *Biomass Conversion and Bioenergy*, Springer Nature | Oct 2022
23. *Biomass Conversion and Bioenergy*, Springer Nature | Aug 2022
24. *Biomass Conversion and Biorefinery*, Springer Nature | Aug 2022
25. *Biomass Conversion and Biorefinery*, Springer Nature | Sep 2021

Professional Memberships

1. US-India Chamber of Commerce | Sep 2025–Present
2. Society of Women Engineers | Oct 2024–Present
3. American Society of Mechanical Engineers | 2021–2024
4. American Water Works Association | 2021–2025
5. Water Environment Federation | 2020-2021
6. American Chemical Society | 2019-2020

Professional Certifications

1. Entering Mentoring for Undergraduate Researchers, Center for the improvement of Mentored Experiences in Research, National Research Mentoring Network | 2026.
2. Radiation Safety Training, TXST |2025
3. Certificate in Interdisciplinary Research & Grantsmanship, TXST | 2023
4. Graduate Energy Certificate, University of North Texas| 2021
5. ISO 9001 Certified Quality Management Auditor, India | 2005

AWARDS AND HONORS

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1. University Innovator Award, Inaugural Texas Innovation Conference & Awards, TCU | April 2026.
2. Spotlight Finalist, TechConnect World Innovation Conference, NC | March 2026.
3. Bobcat Proof-of-Concept Award | 2026.
4. Faculty Innovation Accelerator Program Award, Biochar Earth (project name) | 2025.
5. Faculty Innovation Accelerator Program Award, AquaShield (project name) | 2025.
6. Top Innovation Showcase Poster Award, Hydrogel, (Audience Voted), Texas State University | February 10th, 2025.
7. First Position, Buda Economic Development Pitch Competition | Nov 2024.
8. Second Position, New Venture Pitch Competition| June 2023.

9. Health Scholar Showcase Award| Translational Health Research Center, TXST | March 2023.
10. Second Prize, Research Poster Award, SWST International Convention | 2020
11. Second Prize, Oral Presentation Award, SWST International Convention | 2021
12. Graduate Student Research Award, Green synthesis of silver nanoparticles and their antibacterial activity, University of North Texas | 2020.
13. Graduate Student Research Award, Comparative Study of the Performance of Plant-based Adsorbent with Chemical Adsorbent for Application in Wastewater Treatment, University of North Texas | 2019.
14. Second Prize, Three-Minute Thesis Competition, University of North Texas | 2019.
15. President's Award for Exemplary Teaching, State University of New York, (SUNY) Cortland, Chemistry Dept | 2016.
16. President's Award for Exemplary Teaching, State University of New York, (SUNY) Cortland, Chemistry Dept | 2015.
17. Dronacharya Award, Center for Wildlife and Environmental Studies, India | 2006.
18. Paryavaran Ratna Award, Center for Wildlife and Environmental Studies, India | 2006.