

Aayana Updesh Roy

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EDUCATION

Bachelor of Science, Chemical Engineering, University of Wisconsin-Madison, USA 2024–2028
GPA: 3.97/4.00

AICE Diploma with Distinction, Cambridge (CAIE) A Levels, India 2021–2023
Grades: A* A* A* A* B B
Subjects: Mathematics, Physics, Chemistry, Biology, English Language, History

RESEARCH EXPERIENCE

University of Wisconsin-Madison, USA Jul 2025 – Present
Department of Chemical and Biological Engineering, Avraamidou Research Group
Undergraduate Researcher

Project: Systems Optimization for Renewable Energy Transition and Circular End-of-Life Management using Mixed-Integer Linear Programming (MILP) Framework

- Formulated & solved simplified mixed-integer linear programming problems in Julia/Gurobi
- Collected parameters for material and energy circularity assessment of decommissioning pathways from Life Cycle Analyses (LCA) literatures and Life Cycle Inventory (LCI) databases
- Conducted data analysis and visualization of various scenarios and performed sensitivity analysis on the impact of material reuse on overall circularity and economics of the system

University of Wisconsin-Madison, USA Sep 2024 – May 2025
School of Medicine and Public Health, Sheets Lab
Undergraduate Research Scholar

Project: RNA-Binding Affinity Analysis of mutated Bicaudal-C Regulatory Protein

- Quantified high-purity Bicaudal-C protein variants and conducted RNA-Protein binding assays to compare binding affinity of wild-type and mutant proteins

Indian Institute of Technology Delhi, India Nov 2023 – Mar 2024
Department of Biochemical Engineering and Biotechnology, Srivastava Lab
Research Intern

Project: Isolation and 16S rRNA-Based Genetic Characterization of Polypropylene-Degrading Bacteria for Plastic Bioremediation

- Isolated and characterized polypropylene-degrading bacterial strains through 16S rRNA sequencing and phylogenetic analysis to evaluate plastic biodegradation potential

HONOR

Jerry Eaton and Richard Feustel Founders Scholarship, Wisconsin Association of Energy Engineers Oct 2025
Awarded highest scholarship for demonstrated promise in energy efficiency and sustainability

John and JoAnn Bolender Engineering Scholarship, College of Engineering, UW-Madison Jul 2025
Recognized for outstanding academic performance

Distinguished Scholar Award, Wisconsin International Scholars Program, UW-Madison Apr 2025
Honored for distinguished scholarship, integrity, excellence and contribution to the community

Inductee, Tau Beta Pi Engineering Honor Society Apr 2025
Invited based on academic excellence and exemplary character

Alpha Chi Sigma Alumni Endowed Scholarship, Alpha Chi Sigma Fraternity Mar 2025
Awarded for demonstrated commitment to solving humanity's problems

Highest Academic Achievement Award, Champion International School, India Jun 2023
Awarded for achieving top grades in Cambridge A Levels

INDEPENDENT PROJECT

Thermal Feedback & Alert System for Temperature Control in UW-Madison Libraries

Jan 2025 – Present

- Deployed a full-stack thermal comfort feedback system across 3 floors and 9 thermal zones of UW–Madison’s largest undergraduate library, collecting 60+ user responses and 13 data parameters including real-time occupancy and weather in a one-week pilot
- Collaborated with a 4-member library team to align UX design and technical feasibility, achieving >80% positive usability feedback during beta testing and ensuring system uptime of 100%
- Processed data to identify zones with higher thermal dissatisfaction and project 8–12% HVAC energy savings through temperature setpoints modification
- Website: thermocomfort.aayana.com.np/about

LEADERSHIP

Associated Students of Madison (Student Government)

Apr 2025 – Present

Sustainability Projects Co-Coordinator

- Coordinated campus-wide initiatives in energy efficiency and renewable energy adoption in partnerships with 3+ campus departments and 10+ sustainability student organizations, engaging over 2,500+ students

Wisconsin Engineering Student Council

Apr 2025 – Present

Vice President of Communications

- Grew social media reach by 242.7% by streamlining communication to reach 5,000+ students using Instagram and LinkedIn

Citizens’ Climate Lobby

Volunteer

Jun 2025 – Present

- Surveyed 20+ local HVAC contractors to identify adoption barriers for Inflation Reduction Act (IRA)-subsidized heat pumps; tabled in events to promote heat pumps in single homes

OTHER PROFESSIONAL EXPERIENCE

University of Wisconsin-Madison, USA

Apr 2025 – Present

Marketing Intern

- Automated monthly demand forecasting using Excel modeling
- Coordinated 5+ cross-functional marketing and data projects

University of Wisconsin-Madison, USA

May 2025 – Aug 2025

Event & Analysis Assistant

- Analyzed 400+ survey responses using Python (NumPy, pandas, Matplotlib) and Power BI
- Executed end-to-end event management for 25+ events in 5 weeks

SKILLS

Coursework	Mass and Energy Balances, Analytical Chemistry, Organic Chemistry, Linear Algebra
Programming	Python, Julia (JuMP for linear programming), Git/GitHub, Excel, Power BI, LaTeX
Language	English (fluent), Hindi (fluent), Nepali (fluent), Mandarin (classroom study, 3 semesters)
Process	Lean Six Sigma, Root-Cause Analysis, Design of Experiments (DOE), Process Flow Diagram (PFD)
Trainings	OSHA Laboratory Standard (29CFR 1910.1450), American Red Cross CPR-AED

INTERESTS

Energy systems modeling, circular economy, policy-integrated techno-socio-economic systems analysis, mathematical optimization, machine learning, applied mathematics, sustainable supply chains, lifecycle assessment, language and cultural exchange, environmental storytelling, UX & graphics design, soft pastel painting, travel and cooking