

BAISHAKHI BOSE

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RESEARCH INTERESTS

Sustainable and resilient infrastructure materials; low-carbon cementitious materials; internal curing and custom synthesized hydrogel-modified concrete; circular materials and carbon management; life-cycle assessment (LCA), techno-economic analysis (TEA), and material flow analysis of building materials; K–12 STEM education; innovative pedagogies for undergraduate engineering education.

EDUCATION

2017–2021	Ph.D., Materials Engineering, Purdue University, West Lafayette, IN.
2014–2017	M.S., Civil & Structural Engineering, Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh.
2009–2014	B.S., Civil Engineering (Major: Environmental Engineering), Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh.

ACADEMIC & RESEARCH APPOINTMENTS

2026–Present	Assistant Professor, Dept. of Civil and Construction Engineering and Management, The University of Texas at Tyler.
2025–2026	Lecturer, Dept. of Engineering Education, The Ohio State University.
2024–2025	Postdoctoral Affiliate, University of California, Berkeley.
2021–2025	Postdoctoral Scholar, Lawrence Berkeley National Laboratory.
2014–2017	Lecturer, Dept. of Civil Engineering, BUET.

SELECT RESEARCH & COLLABORATIVE PROJECTS

2026

- Co-PI, *Engineering for US All (e4usa)* curriculum development, National Science Foundation-supported project, The Ohio State University and Vanderbilt University.

2021–2025

- Conducted LCA, TEA, and material flow analysis of emerging and circular technologies, including novel plastics, EV batteries, and building materials; contributed to NREL's *Re-X Before Recycling Prize* as a national laboratory analyst.
- Led and contributed to interdisciplinary research on low-carbon and circular materials and carbon management, including plastics recycling, bio-derived materials, carbon-storing building materials, and carbon dioxide removal pathways.
- Developed assessment frameworks for emerging materials and technologies, including approaches for evaluating feasibility, environmental impacts, and supply-chain resilience under limited or uncertain data.

2017–2021

- Investigated superabsorbent polymer-based internal curing of high-performance concrete, with emphasis on microstructure, durability, and material performance.

2014–2017

- Conducted experimental research on construction and pavement materials, including mechanical and durability characterization of concrete, bituminous materials, and compressed stabilized earthen blocks for resilient and low-cost infrastructure applications.
- Investigated reinforced concrete durability and corrosion under aggressive environmental exposures, linking material performance and corrosion behavior to support practical assessment and engineering guidance.

COURSES TAUGHT

UT Tyler (2026 – Present)

- CENG 4311 – Reinforced Concrete Design

The Ohio State University (2025- 2026)

- [Engineering 1181.01 – Fundamentals of Engineering I](#)
- [Engineering 1281.01H – Fundamentals of Engineering for Honors](#)
- [Engineering 1282.01H – Fundamentals of Engineering for Honors II \(Robot Design and Build Project\)](#)

Bangladesh University of Engineering and Technology (2014-2017)

- [CE 102 Computer Aided Drafting](#)
- [CE 104 Practical Surveying](#)
- [CE 200 Details of Construction](#)
- [CE 204 Computer Programming Sessional](#)
- [CE 208 Quantity Surveying](#)
- [CE 212 Structural Mechanics and Materials Sessional](#)
- [CE 342 Geotechnical Engineering Laboratory](#)
- [CE 452 Transportation Engineering Sessional I: Highway Materials and Traffic Engineering Design](#)
- [CE 401 Project planning and Construction Management](#)
- [CE 267 Structure-II: Basic Mechanics of Solids](#)
- [CE 467 Structure-IV: Elements of Building and Large Span Structure](#)

HONORS & AWARDS

2026	Rising Star Faculty Grant, The University of Texas System
2026	Travel Grant for National Effective Teaching Institute Workshop at Swarthmore College, PA, Department of Engineering Education, The Ohio State University.
2026	Travel Grant for National Effective Teaching Institute Workshop at Swarthmore College, PA, College of Engineering, The Ohio State University.
2026	KEEN Professional Learning Community Professional Development Fund, The Ohio State University.
2026	Professional Development Incentive for Teaching Endorsement on Building AI Fluency, The Ohio State University.
2023	Travel Grant, Women in Engineering Division, American Society for Engineering Education.
2022	Outstanding Effort in K-12 Outreach, K-12 STEM Education Program, Lawrence Berkeley National Laboratory.
2021	Best Student Poster, ACI 123 Concrete Research Poster Session, ACI Spring Convention.
2020	Outstanding Service Award, Engineering Undergraduate Research Office, Purdue University.
2019	Materials Engineering Graduate Student Robert M. Briney Achievement Award, Purdue University.
2019	Best Student Poster, 10th Advances in Cement-Based Materials, American Ceramic Society.
2011	Silver Standard Award, International Award for Young People, Duke of Edinburgh, UK.
2011	Contribution towards Primary Education for All, Volunteer for Bangladesh.
2010	Bronze Standard Award, International Award for Young People, Duke of Edinburgh, UK.
2009-2014	Dean's List Fellowship, Dean of Engineering, Bangladesh University of Engineering and Technology (BUET).
2009-2014	Undergraduate Merit Scholarship, Department of Civil Engineering, Bangladesh University of Engineering and Technology (BUET).

PEER-REVIEWED JOURNAL PUBLICATIONS

- T. Huang, **B. Bose**, G. Gu, B.A. Helms, J.D. Keasling & C.D. Scown. “Cost, Emissions, and Material Flow Implications of Designing Electric Vehicle Components for Recyclability.” *Environmental Research: Infrastructure & Sustainability*, **2026**. (Under Revision)
- Z. Wang, S. Cheong, H. Wang, J. Demarteau, A. Epstein, **B. Bose**, et al. “Engineered Polyketide synthases enable a microbial chassis for recyclable plastics with tunable properties.” *Nature Biotechnology*, **2026**.
- A.B. Thaneya, A.B., A.P. Gursel, S. Kane, E. Van Roijen, **B. Bose**, Hendrickson, T. P., ... & Horvad, A. “Missed opportunities forgo one-third of mass timber’s carbon storage potential”. *Environmental Science & Technology*, **2026**. (Accepted)
- **B. Bose**, T.P. Hendrickson, S.L. Nordahl, S. Kane, J. Fan, S.A. Miller & C.D. Scown. “Life-cycle carbon footprint and total production potential of cross-laminated timber from California’s wildland-urban interface,” *Environmental Research Letters*, **2025**.
- S. Kane, **B. Bose**, T.P. Hendrickson, J. Fan, S.L. Nordahl, C.D. Scown & S.A. Miller. “A framework for ground-up life cycle assessment of novel, carbon-storing materials,” *Energy & Environmental Science*, **2025**.
- E. Van Roijen, S. Kane, J. Fan, J.A. Olsson, **B. Bose** et al. “Dynamic Accounting of Carbon Uptake in the Built Environment,” *Environmental Science & Technology*, 59:13, 6556–6566, **2025**.
- S. Kane, A.B. Thaneya, P. Gursel, J. Fan, **B. Bose** et al. “Uncertainty in determining carbon dioxide removal potential of biochar,” *Environmental Research Letters*, 20(1), 014062, **2024**.
- D. Mikhalev, S.F. Nejad, S. Ng, **B. Bose** et al. “Practical Insights and Advances in Concrete Pumping,” *RILEM Technical Letters*, 9, 1-9, **2024**.
- T.P. Hendrickson, **B. Bose**, N. Vora, T. Huntington, S.L. Nordahl, B.A. Helms, C.D. Scown, “Paths to circularity for plastics in the United States,” *One Earth*, 7(3), pp.520-531, **2024**.
- C.J. Adams, **B. Bose**, E. Mann, J. Olek, K.A. Erk, “Effect of binder characteristics on workability, hydration, and strength of 0.42 w/b cementitious systems with superabsorbent polymer admixtures,” *Materials and Structures*, 57:1, **2024**.
- J. Demarteau, B. Cousineau, Z. Wang, **B. Bose**, S. Cheong, G. Lan, N.R. Baral et al. “Biorenewable and circular polydiketoenamine plastics,” *Nature Sustainability*, 6: 11, 1426-1435, **2023**.
- C.J. Adams, **B. Bose**, J. Olek, K.A. Erk, “Evaluation of mix design strategies to optimize flow and strength of mortar internally cured with superabsorbent polymers,” *Construct. and Build Mat*, 324, 126664, **2022**.
- **B. Bose**, C.R. Davis, and K.A. Erk, "Microstructural refinement of cement paste internally cured by polyacrylamide composite hydrogel particles containing silica fume and nanosilica" *Cement and Concrete Research*, 143, **2021**.
- M.J. Krafcik, **B. Bose**, and K.A. Erk, "Synthesis and characterization of polymer-silica composite hydrogel particles and influence of hydrogel composition on cement paste microstructure," *Advances in Civil Engineering Materials*, 7, 4, **2018**.

Book Chapters:

- D. Jiao, S. Ng, D. Feys, Y. Wang, D. Mikhalev, **B. Bose** et al. “Effects of pumping on concrete properties.” In: D. Feys and G. De Schutter (eds) *Pumping of concrete. RILEM State-of-the-Art Reports*, Springer, Cham. **2026**. (In preparation).
- C.R. Davis, **B. Bose**, A.M. Alcaraz, C.J. Martinez, and K.A. Erk, “Altering the crosslinking density of polyacrylamide hydrogels to increase swelling capacity and promote calcium hydroxide growth in cement voids,” *3rd International Conference on the Application of Superabsorbent Polymers (SAP) and Other New Admixtures Towards Smart Concrete*. RILEM Bookseries, 24, Springer, Cham. **2020**.
- K.A. Erk and **B. Bose**, "Using polymer science to improve concrete: superabsorbent polymer hydrogels in highly alkaline environments," *Gels and Other Soft Amorphous Solids*, American Chemical Society Symposium Series - 1296, pp 333-356. **2018**.

Reports & Licenses:

- BLDAP Intro to Python/Data Science Curriculum v1, *Lawrence Berkeley National Laboratory (LBNL), Berkeley, CA (United States); University of California, Berkeley*, Oct **2025**.
- Superabsorbent Polymers for Internally Cured Concrete, *Joint Transport Research Program, Indiana Department of Transportation*, Dec **2021**.
- Acceptance of imported aggregates from India for use in concrete works, *Bureau of Research Testing & Consultation, Department of Civil Engineering, BUET*, Sep **2016**.
- Acceptance of imported aggregates from Malaysia for use in concrete works, *Bureau of Research Testing & Consultation, Department of Civil Engineering, BUET*, Apr **2016**.

Conference Proceedings:

- **B. Bose**, L. Rachbauer, E.D. Rios, F.M. Dukes, "Empowerment in STEM Day: Introducing High School Girls to Careers at National Laboratories", *ASCE Annual Conference Proceedings*, **2024**.
- T.L. Larkin, **B. Bose**, "A New Normal: Pedagogical Implications for Physics and STEM Teaching and Learning in the Post-Pandemic Era", *ASCE Annual Conference Proceedings*, **2023**.
- **B. Bose**, H.B. Brotherton, T. Hopper, P. M. Oquendo, L.M. Wang, M. EB Webb, H. Wilkinson, "Graduate Student and Postdoctoral Fellow Perspectives on Advancing Women and Gender Equity in Engineering-for the Next 130 Years", *ASCE Annual Conference Proceedings*, **2023**.
- **B. Bose**, C.J. Adams, J. Olek, K.A. Erk, "Influence of Superabsorbent Polymers on Internal Curing of Cementitious Systems at a water-cement ratio of 0.42", *2nd Civil Engineering Congress, Bangladesh (Invited Paper)*, **2022**.
- M. Broberg, **B. Bose**, R. Pineda-Mendez, D. Devine, R. Gehr, C. Jange, J.E. McDermott, M.C. Loui, J. Eisma "Preparing Graduate Students and Postdoctoral Researchers for Tenure Track Careers: A Unique Faculty Development Mentoring Circle Program", *ASCE Annual Conference and Exposition, Minneapolis, MN*, **2022**.
- T. Manzur, B. Baten, M.J. Hasan and **B. Bose**, "Application of corrosion potential as a tool to assess sustainability of indigenous concrete mixes in Bangladesh", *ASCE International Conference on Sustainable Infrastructure, New York, NY*, **2017**.
- B. Baten, M.J. Hasan, **B. Bose**, T. Manzur, "An efficient experimental setup for rapid assessment of rebar corrosion in reinforced concrete structures", *International Conference on Civil and Architectural Engineering, Colombo, Sri Lanka*, **2017**.
- H. Akter, A. Tahsin, **B. Bose**, T. Manzur, "Performance of brick aggregate concrete: Bangladesh context", *1st Bangladesh Civil Engineering Summit, Dhaka, Bangladesh*, **2016**.
- B. Baten, M.J. Hasan, **B. Bose**, T. Manzur, "Corrosion potential of stone and brick aggregate concrete in the context of Bangladesh", *1st Bangladesh Civil Engineering Summit, Dhaka, Bangladesh*, **2016**.
- M. S. Islam, M.I. Hossain, M. A. Islam, A. R. Shahriar, **B. Bose**, "Construction of earthen houses using CSEB: Bangladesh perspective" *3rd International Conference on Advances in Civil Engineering, Chittagong, Bangladesh*, **2016**.
- R. Rumman, **B. Bose**, M.A.B. Emon, T. Manzur, M.M. Rahman, "An experimental study: strength prediction model and statistical analysis of concrete mix design", *3rd International Conference on Advances in Civil Engineering, Chittagong, Bangladesh*, **2016**.
- R. Sabrin, T. Manzur, **B. Bose**, R. Rumman, "Nanotechnology: Bridging the cracks between ancient and modern concrete technology", *International Conference on Advances in Civil Infrastructure and Construction Materials, Dhaka, Bangladesh*, **2015**.
- **B. Bose**, M. R. Islam, M.A. Ali, "Manganese removal from water by filtration through manganese oxide coated media", *2nd International Conference on Advances in Civil Engineering, Chittagong, Bangladesh*, **2014**.

SELECT LEADERSHIP & SERVICE

June-Aug 2026	Mentor, Engineering Academic Career Club, Purdue University.
Feb 2026	Mentor, GradBridge: Engineering Career Mentoring Circles, Purdue University and UC Berkeley.
Apr 2025	Technology Advisory Committee, Rocket Fund, California Institute of Technology.
Mar 2025	Grant Review Committee for Undergraduate STEM Education grants, National Science Foundation.
Jan 2022-Sep 2025	Lab Ambassador, Talent Outreach Program, Lawrence Berkeley National Laboratory.
Jan 2022-Sep 2025	Empowerment Chair, Women's Support and Empowerment Council, Lawrence Berkeley National Laboratory.
Jan 2022-Aug 2026	Fellowship Application Review Committee, Association for Women in Science (AWIS) East Bay.
June 2022-Mar 2025	Spotlight Team Chair, ASEE Commission on Diversity, Equity and Inclusion.
Apr 2022-Apr 2023	Social Program Chair, ASCE Structural Engineering Institute-Oregon Section.
Mar 2022-Apr 2023	Strategic Plan Development, ASEE Commission on Diversity, Equity and Inclusion.
Mar 2022-Present	Member, RILEM Technical Committee on Pumping of Concrete.
Dec 2021-Dec 2023	Chief Administrative Officer, Asian Pacific Islander Employee Resource Group, Lawrence Berkeley National Laboratory.
July 2021-Aug 2022	Year of Impact on Racial Equity (YERI) Engineering Student Organization Taskforce, ASEE Commission on Diversity, Equity and Inclusion.
July 2021-Aug 2023	Collegiate Member, Conference Advisory Board, Society of Women Engineers.
Aug 2017-Aug 2021	Leadership Team Staff, Women in Engineering Program, Purdue University.
Aug 2018-Aug 2021	TGA Superuser, Soft Materials Characterization Lab, Purdue University.
Aug 2019-July 2020	Safety Chair, Materials Engineering Graduate Students Association, Purdue University.
May 2019-June 2020	Cultural Secretary, Bangladesh Students Association, Purdue University.
Aug 2014-June 2017	Faculty Advisor, Dance Club, Bangladesh University of Engineering and Technology (BUET).
June 2012-July 2014	Unit Face Member, Engineering Students' Association of Bangladesh.
June 2013	Support Ambassador, Furusato Kodomo Yume School, Fukushima, Japan.
June 2009-June 2011	General Secretary, SHEBA Students Organization, Bangladesh University of Engineering and Technology (BUET).