

EEE Faculty Candidate Seminar

Date: February 1, 2024, at 10:30 AM

Location: POTR 234 (Fu Room)

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Fundamentals of Engineering Program

West Virginia University



Cutting-edge Innovation in Environmental and Ecological Engineering Education

Abstract

This presentation will highlight Dr. Zhang’s vision to lead cutting-edge innovations in Environmental and Ecological Engineering (EEE) education. EEE is a convergent research and education field adopting an integrated approach to address global environmental and ecological problems. Innovations within EEE education are critical to advance learning, discovery, and engagement in this field. This vision is proposed to be achieved by utilizing a three-pillar approach: (1) pedagogical and technology innovations for learning and engagement through Scholarship in Teaching and Learning (SoTL), (2) discovery, learning, and engagement in sustainability and energy-water-environment nexus, and (3) advancing knowledge on convergent education with multidisciplinary collaboration. Examples to be discussed include (1) a recently awarded NSF project on broadening participation in engineering based on the Diffusion of Innovations framework, (2) a virtual operation environment of a 30L biopharmaceutical-grade bioreactor using VR for students to practice bioreactor operations in a bioprocessing lab, (3) enhanced biohydrogen production from biomass hydrolysates via a co-culture fermentation system of *C. beijerinckii* and *G. metallireducens* with different extracellular electron shuttles, and (4) an educational version of open source LCA tools for emerging single-use biomanufacturing systems to be used in training courses of biopharmaceutical industry professionals to improve their awareness of sustainability.

Bio

Dr. Xinyu “Catherine” Zhang received her PhD degree in Environmental Engineering from the University of Illinois at Urbana-Champaign (UIUC). She is currently a Teaching Assistant Professor at West Virginia University (WVU) leading an NSF project on engineering education and a licensed Professional Engineer. She returned to academia after spending several years in engineering consulting and engineering entrepreneurship, and taught courses to undergraduates, graduates, industrial professionals, and industry regulators in the disciplines of environmental, biological, chemical, and civil engineering at NC State University’s Biomanufacturing Training and Education Center (BTEC), WVU, and UIUC. Her research interests include engineering education such as broadening participation in engineering, teaching technology innovations, and engineering entrepreneurship, as well as EEE discipline-based topics such as energy-water-environment nexus and sustainable biomanufacturing.