TYLEE KARECK

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EDUCATION

Bachelor of Science in Chemical Engineering, *Minor in Mathematics* — *Expected May 2025*
Oklahoma State University, Stillwater, OK — GPA: 4.0/4.0

PROFESSIONAL EXPERIENCE

CEAT Undergraduate Research Scholar — September 2023 – Present
Prof. Zheyu Jiang Research Group, Oklahoma State University, Stillwater, OK

- Developed a differential-algebraic equation (DAE)-based optimization model in `pyomo.dae` for conventional and electrified naphtha cracking reactors
- Reformulated the DAE-based model into a nonlinear program (NLP) via orthogonal collocation discretization, which was solved in IPOPT to obtain minimum energy consumptions
- Built new Aspen HYSYS simulations to model cracking operations with multiple feedstock compositions and compared the results with optimal solutions found from the optimization model

Undergraduate Teaching Assistant and Peer Mentor — September 2024 – Present
School of Chemical Engineering, Oklahoma State University, Stillwater, OK

- Held 7 office hours per week to mentor ≈ 30 undergraduates in core chemical engineering courses
- Designed homework problems, drafted solutions, and hosted exam reviews for CHE 3333: Transport Phenomena

Mathematics Tutor — August 2022 – May 2024
Mathematics Learning Success Center, Oklahoma State University, Stillwater, OK

- Coached students to be independent learners by implementing student-centered tutoring techniques
- Tutored ≈ 20 students per week in undergraduate math courses from Calculus I through Linear Algebra

PUBLICATIONS & MANUSCRIPTS

2. Ghasemi Naraghi, S.; Kareck, T.; Xiao, L.; Reed, R.; Ramanan, P.; Jiang, Z. Decarbonization of Steam Cracking for Clean Olefins Production: Microgrid Planning and Operation. In: *Optimization of Sustainable Process Systems: Multiscale Models and Uncertainties*. John Wiley & Sons, Inc., 2025.

1. Ghasemi Naraghi, S.; Kareck, T.; Reed, R.; Ramanan, P.; Jiang, Z. Multi-objective Optimization of Steam Cracking Microgrid for Clean Olefins Production. *In preparation.*

PRESENTATIONS

3. Ghasemi Naraghi, S.; Kareck, T.; Reed, R.; Ramanan, P.; Jiang, Z. Multi-objective Optimization of Steam Cracking Microgrid for Clean Olefins Production. 35th European Symposium on Computer Aided Process Engineering (ESCAPE), Ghent, Belgium, July 2025.

2. Ghasemi Naraghi, S.; Kareck, T.; Jiang, Z. Decarbonization of Steam Cracking for Clean Olefins Production: Optimal Microgrid Scheduling. INFORMS Annual Meeting, Seattle, WA, October 2024.

1. Kareck, T.; Jiang, Z.; Ghasemi Naraghi, S. Microgrid Optimization: Hydrogen Technology Modeling. Oklahoma State University Undergraduate Research Symposium, Stillwater, OK, April 2024.

HONORS & AWARDS

John Klopp Teaching Assistant Scholarship — May 2024 – Present

CEAT Undergraduate Research Scholarship — September 2023 – Present
- Awarded to selected undergraduate researchers in the College of Engineering, Architecture, and Technology

Chemical Engineering Alumni Scholarship — March 2022 – May 2023
- One of the highest honors to chemical engineering students at Oklahoma State University

National Merit Scholarship Finalist — August 2021 – Present

PROFESSIONAL & HONOR SOCIETIES

American Institute of Chemical Engineers (AIChE), Omega Chi Epsilon Chemical Engineering Honor Society (Secretary of OSU Branch), Phi Kappa Phi Honor Society, Tau Beta Pi Engineering Honor Society