Elisa Koolman (any pronouns)

koolmanelisa1@gmail.com | (251)458-3937 | U.S. Citizen, EU Citizen | LinkedIn

About

I am a second-year Mechanical Engineering Ph. D. student at the University of Texas at Austin in the Center for Engineering Education. My goal in my research is to take an intersectional lens to investigate barriers in engineering education. I also bring this mindset into research on university makerspaces and teaching tools.

Education

University of Texas at Austin, Austin, TX — Fall 2022-Present
M.S./ Ph. D. in Mechanical Engineering, Manufacturing and Design
GPA: 3.9

Georgia Institute of Technology, Atlanta, GA — Fall 2018-Spring 2022
B.S. in Mechanical Engineering, highest honors

Research Experience

Research Assistant, Dr. Maura Borrego, Center for Engineering Education — August 2022-Present
Department of Mechanical Engineering, University of Texas at Austin

- Using qualitative methods, I am developing a framework for university makerspace interactions.
- In a systematic review, I am investigating barriers for disabled STEM students.
- In a collaboration with the SiDi lab, I am designing a efficacy study for a teaching software for engineering students.

Research Assistant, Dr. Katherine Fu, Engineering Design Research Lab — June 2021-June 2023
Department of Mechanical Engineering, Georgia Tech

- In a fluid mechanics education research project, I coded 3 sets of reflections written by 55 students using NVIVO through the lens of Bloom's Taxonomy. I also tested the coding rubric. Research is led by Boni Yraguen.

Student Assistant, Dr. Roxanne Moore — August 2021-May 2022
Center for Integrating Science, Mathematics, and Computing,
Georgia Tech

- On the NSF-funded BIRDEE project, I wrote lab procedures, discuss the testing methods for students, and input and analyze data from previous semester

Undergraduate Research Assistant, Dr. Claire Berger — January 2020-April 2020

- Analyzed graphene samples using Raman Spectroscopy, AFM, and MATLAB

Teaching Experience

Graduate Teaching Assistant at the University of Texas at Austin' School of Mechanical Engineering:

ME 366J—Design Methodology August 2022-May 2023

Provide instruction on design methodology theory. Manage student projects on musical instrument design and delivery drone project design. Provide guidance on design procedures and give thorough feedback on design reports. Moderate disputes among team members. Encourage curiosity among students. Guide ideations practices such as brainstorming, mind mapping, 6-3-5, and low-resolution prototyping

Undergraduate Teaching Assistant at Georgia Tech's School of Mechanical Engineering:

ME 2110—Creative Decisions and Design January 2020-May 2021

Lab space safety supervisor for a 150-student course. Train students in the use of handheld power tools, lathe, bandsaw, miter saw, and 3D printing. Answer questions about the use of LabVIEW, Solidworks, Arduino, and mechatronics.

ME 3340—Fluid Dynamics January 2021-May 2022

Grade bi-weekly homework and 8 exams of 55 students. Discuss common mistakes and rubric adjustments with the professor

ME 2202—Dynamics of Rigid Bodies January 2021-May 2021

Grade two 3- to 5-page design projects of 55 students and give feedback.

Job Experience

Facilities Co-Op at Alcon Johns Creek, Atlanta, GA May 2021-August 2021

Work with multiple departments on new construction projects and urgent maintenance needs. My major project was documenting 60+ electrical lines in AutoCAD for future referencing.

Skills

CAD	Solidworks, AutoCAD
Software	MATLAB, Arduino, LabView, Microsoft Office Suite
Languages	Spanish—Advanced reading and listening, conversational speaking
Machining	Handheld power tools, soldering, miter saw, band saw, lathe, 3D printing, sewing
Mechanical Engineering	Manufacturing, Design, Communication, Instrumentation, Structural Analysis, Analyzing Heating and Cooling Systems, Robotics, Prototyping, Numerical Methods

Research Projects

Development of theory and pedagogy within University Makerspaces

Systematic review of disabled students in STEM

Efficacy study of teaching software in design for engineering students

Efficacy study of Authentic Learning Assignment, Design Your Own Problem (DYOP)

Biologically Inspired Design for Engineering Education (BIRDEE) project

Service

Georgia Tech Annual Latino College and STEM fair volunteer, 2019

Leadership

Founding Member and VP of Outreach of the Students for Education Coalition club at Georgia Tech — Fall 2021
The club's goal is to compile all K-12 outreach on campus and host monthly workshops on education policy, practices, and research.

Student Liaison for Georgia Tech's EXPLORE Living Learning Community — August 2018-May 2019
Organized events, gathered feedback, gave tours, student outreach, and recruitment.

Drum Major for Sound of the Eastern Shore, Daphne, AL — Fall 2017
Co-run a band of 200 musicians and set up stereo equipment. Create relationships and lead community-building exercises

Grant Writing

Community building in study hours for undergraduate transfer students, University of Texas at Austin Center for Engineering Equity SEED Grant, **$4508**, Project Lead/PI — August 2023-May 2024

Certificates/ Trainings

Citi Training: Responsible Conduct of Research, Basic Course — Fall 2018

Citi Training: Social Behavioral Research Investigators and Key Personnel, Basic Course — Summer 2021

Cockrell School of Engineering TA Certification — Fall 2022

Awards

Leo J. Drum Scholarship — Fall 2019-Spring 2022
Awarded to Georgia Tech Mechanical Engineering students from Alabama in the top 10% of their class

President's Undergraduate Research Award (PURA) Recipient — Spring 2022
Awarded to fund my project 'Development and Assessment of an Authentic Learning Assignment Applied in a Fluid Mechanics Course for Increased Critical Thinking and Student Engagement' with advisor Dr. Kate Fu and collaborators Dr. Roxanne Moore and Boni Yraguen

Speaking Engagements

ASEE 2023 Poster Presentation — June 2023

Publications

Yraguen, B., & Koolman, H., & Moore, R., & Fu, K., & Lummus, A. (2022, August), Using Post-Assessment Reflection to Enhance Student Learning Outcomes in a Fluid Mechanics Course Paper presented at 2022 ASEE Annual Conference & Exposition, Minneapolis, MN. https://peer.asee.org/41025