DEPARTMENT OF ENGINEERING AND COMPUTING EDUCATION
COLLEGE OF ENGINEERING AND APPLIED SCIENCE

APPLICATION DEADLINE: April 3, 2026

PROJECT TITLE: Modularizing the First Year of Engineering: Impacts on Student Stress, Sense of Belonging, and Engineering Identity

Physical Requirement :
There are no physical requirements beyond usual computer-focused work

Project's Technical Skills Requirement :
Ability to summarize, interpret, and visualize quantitative data; attention to detail in handling and cleaning data; Comfort using Excel, Google Sheets, or statistical software (R, Python, SPSS); willingness to learn new tools like local LLMs; Willingness to learn new methods, tools, and concepts related to engineering education research

Project's Available Positions : 1

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Project Description

The University of Cincinnati’s first-year engineering program is undergoing a major curricular transformation. Traditional first-year engineering experiences often emphasize rigid course sequences and limited student choice, which can feel misaligned with the expectations of today’s students. These structures can make it difficult for students to explore their interests, personalize their educational pathways, and develop a strong sense of connection to engineering early in their academic careers.

At the same time, engineering has developed a reputation as one of the most stressful fields of study in higher education. With some programs reporting attrition rates approaching 50%, there is a growing need to rethink how first-year experiences support student success, well-being, and persistence.

This project asks: What if the first-year engineering experience were more flexible? How might increased choice and personalization influence students’ stress levels, sense of belonging, and development of an engineering identity?

You will join an ongoing project analyzing data from students enrolled in the first-year engineering program at UC between 2024 and 2026. All students complete a survey measuring key outcomes such as engineering identity, intention to persist in engineering, sense of belonging, perceived stress, and experiences with “engineering stress culture” (expected n ? 1,600). A subset of students also completes brief weekly surveys across both semesters, reporting their stress levels and most significant stressors on three randomly selected days (expected n ? 8,000 responses). In addition, approximately 30 students participate in follow-up interviews to provide deeper insight into their experiences. These are the data we will examine throughout the experience.

Through this work, you will gain hands-on experience with both quantitative and qualitative research methods. This includes modeling longitudinal data, measuring complex constructs that are not directly observable (such as identity and belonging), and analyzing interview data to identify meaningful patterns. You will also work with locally hosted large language models to analyze open-ended text responses, gaining exposure to emerging approaches for qualitative data analysis. Across these approaches, you will learn how to integrate qualitative and quantitative findings to develop a more complete understanding of student experiences.

These skills extend beyond traditional engineering research and are highly transferable to careers in areas such as user experience, product design, and human-centered engineering. More broadly, this project contributes to ongoing efforts to redesign engineering education in ways that better support student well-being, engagement, and success.