Introduction

The campus wide effort at Lawrence Technological University to foster an entrepreneurial mindset in our graduates is focused on three areas. These are faculty engagement, curriculum development, and student engagement. With regard to curriculum development, we intentionally weave a continuous thread of entrepreneurially minded learning through our core engineering curriculum. In the freshman year, we lay the foundation of entrepreneurial mindset development in our EGE 1001 Introduction to Engineering Design Projects. In the sophomore year, engineering students take EGE 2123: Entrepreneurial Engineering Design Studio and build upon the foundation of entrepreneurial mindset development laid in the introductory design course. The information collected here pertains to this unique sophomore level course.

Specifically, in this course, students identify opportunities for engineering design themselves within the context of the design theme "Accessibility in the Workplace". The focus of this theme is to design and build a working prototype that will assist real customers with disabilities in the workplace. Students engage real customers and identify solutions to these opportunities based on their customers' needs. Finally, students design, build, and test working prototypes that create value for these customers. Throughout the design process, students must work in a team setting, manage a long term project, account for cost and market implications, and communicate to all stakeholders in written, verbal, and public presentation formats. EGE 2123 meets twice a week for 2.5 hours each class period in a dedicated studio classroom that has been intentionally designed to be flexible and enhance collaboration and innovation. The specific learning objectives for this course are seen here.

By the end of the semester, students will be able to:

1. Generate, screen, and select promising design opportunities.
2. Organize, plan, and manage a long term engineering project within a team environment.
3. Identify and communicate the value of a design in terms of economic, professional, personal, and societal value.
4. Translate customer feedback into design specifications.
5. Utilize a systematic design process in order to bring a project to fruition.
6. Identify and utilize technical tools and skills needed to create a viable design solution.
7. Account for cost, value, and market implications at all stages of development.
8. Communicate design status and results to all stakeholders in verbal, written, and public presentation formats at appropriate points in the development timeline.

Since the students in this course are engaged in a systematic design process from opportunity identification and ideation through building and testing prototypes, the course is structured in stages that mirror the stages of the design process. The content needed for each stage of the design process is spread progressively through the course and delivered at the appropriate points in the design process when students are ready to apply the concepts. This format fits well with the chosen studio-based pedagogy of the course and the need to scaffold student learning as they work through a semester long project. Also, since customer engagement is vital to achieving the above course learning objectives, students interact with real customers through a partnership with a local non-profit organization, Services to Enhance Potential (STEP). STEP works with clients with a wide range of cognitive and physical disabilities as well as those with mental health needs to develop, train, and place them into meaningful employment. STEP's mission fits well with the design theme used in EGE 2123 - "Accessibility in the Workplace" since the focus within this theme is designing and building prototypes that will help people with disabilities in the workplace.

Students are assessed through a variety of individual assignments and team design review presentations. These reviews are oral presentations of the team's progress at various points in the design process. The audience members for these reviews are not only the studio instructors and classmates but also additional faculty from a variety of disciplines, industrial advisors from companies in the local area, and stakeholders from our non-profit partner, Services to Enhance Potential (STEP). This type of audience provides the students an opportunity to communicate their work in a professional manner to multiple stakeholders having a broad range of experiences and viewpoints. Indeed, these milestone review presentations have proven beneficial for the students by both enhancing their communication skills and providing them with valuable input on the technical aspects of their projects throughout the semester.