University of Florida Engineering Innovation Institute
Annual Report
AY 2023-2024 (Summer 2023 - Spring 2024)

The University of Florida Engineering Innovation Institute (EII; www.eng.ufl.edu/innovation) was founded in 2010 with a mission to foster a culture of innovation among faculty, students and staff of the Herbert Wertheim College of Engineering. The Institute produces leaders with engineering and innovation skills to attack society's most daunting problems and change the world.

As highlighted below, over 2,000 UF students from myriad disciplines of engineering and beyond directly participated in our courses, certificates and minors, experiential education programs, and outreach, including meaningfully engaging with countless companies and over 30 alumni through 65 EII Student Leadership Team organized and managed events.

This EII Annual Report is meant to concisely capture the Institute's goals, activities, and outcomes in the Academic Year 2023-2024. While EII programs work together synergistically, for clarity program highlights are reported by Academic Offerings, Experiential Education Programs, Faculty Service, and Outreach through UF Innovation Station Sarasota County.

Questions can be directed to Erik Sander, The Michael Durham Executive Director, UF Engineering Innovation Institute at esander@ufl.edu or 352-392-7047.

Academic Offerings

- EII provided in-depth coursework to 876 unique engineering students comprising 505 undergraduate and 371 graduate students. Almost 8,000 engineering students have taken the Institute coursework since the start of the program in 2010, with an average student enrollment annual growth rate of 16%. Many students will take multiple courses in the Institute as their academic schedules allow and most EII courses are 3 credit-hour enrollments that provide students with deep learning experiences complemented by experiential education programs. EII faculty taught 67 sections with 983 total enrollments providing 2,826 Student Credit Hours in this reporting period.

- The Institute offers undergraduate and graduate certificates in Engineering Innovation, and an undergraduate Minor in Engineering Innovation. These are some of our most dedicated students as these require three or five of our courses respectively, and enrollments in both the Certificates and the Minor are accelerating. To date, 275 students have been awarded the Engineering Innovation Certificate, and in this fiscal year an additional 40 undergraduate and 29 graduate students applied to pursue the Certificate, both all-time highs. To date, 113 undergraduate students have received the Engineering Innovation Minor, and in this fiscal year an additional 51 students applied to pursue the Minor.

- Internationalizing the Program – For the first time, EII took the Engineering Innovation and Entrepreneurship courses international in a significant way. In summer of 2023, Erik Sander took 15 UF interdisciplinary undergraduate engineering students to Berlin to gain instruction and international experiences in the same courses offered in Gainesville, compacted from two semesters into meeting daily for eight weeks. The UF students were joined by students from University of Washington and UCLA, as well as 13 international students provided by our partner Technische Universität Berlin hailing from Spain, Germany, France, Colombia, Singapore, Australia, and Turkey. The student consensus was that this truly international feature added a great dimension to the student learning experience, inside and outside the classroom. The students took full advantage of everything in Berlin (e.g., 200+ museums) and beyond as the program structure allowed the students to travel in groups to Potsdam, Dresden, London, Barcelona, Copenhagen, Prague, Garmisch / Zugspitze, Vienna, Amsterdam, Paris, Dublin, and Munich. Importantly, because all UF students took the Innovation and Entrepreneurship courses in serial, the students working in team were able to fully explore their self-initiated and vetted projects along the full creative ideation to entrepreneurial execution spectrum. Projects included developing a next-gen medicine dispenser tailored toward the elderly and their caregivers, mitigating coastal community pollution through a unique public/private partnership program, designing means to expand the reach of micro-green grocers with sustainable products, developing low-cost devices and strategies to address eye strain and damaging posture of computer users, and creating crowdsourcing solutions to assure the state of EV chargers and assure driver safety in rural areas.

- EII faculty continued to support the efforts of engineering student led companies through mentoring and encouraging participation in various business competitions. For example, of the roughly 200 applicants to the UF Big Idea Competition sponsored by the Warrington College of Business, 36 companies listed their primary contact/founder as an engineering student. Five of the sixteen HWCOE student companies were selected as Sweet 16 Finalists and one of the Final Four winners was from HWCOE.

Experiential Education Programs

In a major new experiential education program, in fall 2023 EII launched The Innovation Gator Network for Inspiring Technological Entrepreneurship (IGNITE), a dynamic student-led innovation leadership group committed to creating a culture of innovation and entrepreneurial spirit within the College of Engineering and the broader Florida community.

IGNITE student leaders, in partnership with EII faculty, inspire their peers to adopt an innovative mindset by providing the necessary skills, resources, and mentorship. They aim to foster a supportive environment where students can mutually learn, experiment with emerging technologies, and pursue their passions, turning ideas into meaningful ventures and positively impacting the world around them. While housed in the Engineering Innovation Institute, IGNITE is open to all students across the University of Florida, thus facilitating cross-disciplinary collaboration.

IGNITE members serve as catalysts for change, actively engaging with students, faculty, alumni, and industry professionals to bridge the gap between academia and real-world application. Through their engagement with IGNITE, students can enhance their leadership skills, gain valuable professional experience, and broaden their creative problem-solving abilities by applying their knowledge in practical settings beyond their standard coursework.

By the Numbers:

- Across 65 unique events and offerings, a total of 1,187 students participated in IGNITE's programs, leveraging connections with 33 alumni over the year.
- Twelve student leaders were hired to build programming for 8 programs.
- Thirteen students/student teams were mentored through the startup incubator program, Spark, which also hosted 6 workshops to help students develop their competitive landscape and network with potential cofounders.
- The Creativity Program hosted 5 specialized workshops and a design thinking workshop, connecting student innovators with artists and art students.
- The Innovation Fellows comprised 18 students spanning the colleges of engineering, business, liberal arts, and medicine. Four teams were paired with startups to apply innovative thinking and address challenges such as identifying new customer markets and improving shipping and packaging processes.
- IGNITE's weekly L3Harris seminar series connected 12 industry-leading guest speakers to 447 students.
- The Immersion program arranged visits for 38 students to the Groundswell Startups incubator on the Space Coast to learn from and network with startup leaders.
- Fifty-four students attended 5 community events and conferences that highlighted innovation and entrepreneurship in the startup community across Florida.
- IGNITE's LinkedIn and Instagram averaged a total of 628 impressions each month.
- IGNITE connected five students with summer internships and helped four students obtain full-time positions.

Further detail on these programs includes:

- Creativity Program - This program aims to give Gator Engineers the tools necessary to develop their creative skillset using a multi-level approach that engages students early in their engineering education and consistently builds on their understanding of the creative process. This program, a trailblazer in integrating creative programming within engineering, facilitated five specialized workshops and a partnership-based design thinking project. The artists who taught the workshops ranged in topics such as acting, painting, comic drawing, dance, and AI in music. On average, 27 participants comprising 23 engineering and four art students participated in developing their creative skillset. The community social project looked at local trash and recycling issues from both creative and engineering perspectives. Participants sought to build upon their workshop learnings to think outside of the box to engineer new solutions for local recycling obstacles. Accompanying research conducted by Dr. Elif Akcali, Michael

Durham Professor of Creativity, shows the workshops have cultivated competencies in artistic expression, critical analysis, divergent conceptualization, and complex problem resolution.

- Spark Program + Spark Studio - The Spark program leverages co-curricular student start-up programming with a brand new, world-class student startup facility in Malachowsky Hall (Spark Studio) designed to provide a supportive environment where aspiring student entrepreneurs can develop their ideas, refine their business models, and gain the resources and mentorship necessary to launch and grow their ventures. The Spark program, a structured approach with four stages—scope, start, sell, and scale—provides student entrepreneurs with critical resources, including the Business Model Canvas, financial planning, legal agreements, and intellectual property guidelines. The program has already hosted a Landscape Analysis workshop, with active participation from three venture teams and eight additional students in observational roles. The program is currently expanding its workshop lineup and increasing community event participation to better support the network of student entrepreneurs, which presently includes 10 active student entrepreneurial teams. Examples of the types of student companies helped include topics ranging from biotech, 3D printing, healthcare, restaurant service, and aerospace. Participants receive one-on-one mentorship with IGNITE leaders, exclusive invitations to networking opportunities, and access to the Engineering Innovation Institute's community of connections.

- Immersion Program - The Immersion program is designed to create dynamic collaborations between students and industry leaders. This initiative not only secures internships for students but also integrates them into startups, thus nurturing a strong environment that supports the development of budding entrepreneurs. The Immersion program successfully arranged five visits to Groundswell Startups in Melbourne and San Felasco Tech City, both guided by their founders, involving a total of 46 students. Students engaging in these excursions to startup and business incubators gain insights into the entrepreneurial ethos and the spectrum of opportunities within the startup ecosystem. The program connected with 10 partner companies to explore future opportunities for students, with eight located in Gainesville. Sixteen of our most promising engineering students participated in a resume workshop with the program coordinator before their resumes were distributed to interested employers. Additionally, three summer internships at startups founded by UF alumni were offered and accepted by students in the electrical and mechanical engineering fields.

- Innovation Competency Development - This program offers a skill tracking and certification system that measures student advancement in key innovation leadership areas, including communication, teamwork, and decision-making, preparing them to guide and mentor others effectively. In collaboration with the Center for Undergraduate Research, five freshman honors students embarked on an ambitious project to dissect and understand the skill sets engineers need in the modern workforce. They were charged with the creation of an innovative virtual learning platform designed to offer certifications upon mastering these identified skills. The project's research component was robust, involving 19 interviews with seasoned industry professionals and alumni, and a thorough literature review that included 25 pertinent works.

The research shows that the top skills for student and recent graduate success include divergent thinking during problem solving, effective communication, and resilience in the face of failure. These findings will be used to build workshops and curriculum for IGNITE members and future online skill-tracking platform development.

- UF Innovation Fellows - The multidisciplinary team-based program provides select undergraduates from across campus, mentored by entrepreneurs and innovators, with the foundation for working on technology project teams in preparation for real-world application. The sixth cohort of the UF Innovation Fellows program initiated the investigation into four projects sponsored by industry partners. This collaborative effort brought together 18 students from various fields of study: six from the College of Engineering, seven from the College of Business, four from the College of Liberal Arts and Sciences, and one from the College of Medicine. The cohort's community engagement was highlighted by a group of students visiting their Melbourne-based sponsor, others touring the UF Innovation Hub, and several attending the local CelebrateGNV event hosted by a community non-profit. The projects tackled by the cohort were diverse and innovative, encompassing 1) testing of materials and packaging for forest fire detection systems, 2) market analysis for a university subleasing SAAS platform, 3) development and analysis of artistically designed cat trees, and 4) audience analysis for a music production platform's subscription service. These initiatives not only provided practical experience but also fostered a culture of interdisciplinary collaboration and community involvement, essential for nurturing the next generation of engineering leaders.

- L3Harris Seminar Series - In this weekly speaker series participants learn from the best in industry, gaining insights into cutting-edge technologies, groundbreaking research, and the practical application of innovation in real-world scenarios. It showcases the power of how an innovative mindset can unlock new possibilities, create disruptive solutions, and drive sustainable growth. The weekly seminar series, supported by L3Harris Corporation, commenced its second year dedicated to showcasing pioneering leaders in engineering. It brought together 17 speakers, including 14 alumni, to share their expertise with an average of 37 (high of 77) attendees each week. The speakers included successful entrepreneurs from hardware and software backgrounds, a National Medal of Technology and Innovation awardee, and experts from the fields of 3D printing, augmented and virtual reality, loss prevention, biotech, and green technology.

- Outreach - This program aims to build a dynamic community of innovators by connecting students with campus, alumni, and industry leaders through interactive events and mentorship. It offers inspiration, guidance, and insights into diverse professional fields, enriching students' career development and networking opportunities. The first seven months of establishing and growing an online presence has shown a promising trajectory of reach. The Instagram platform has garnered a following of 307, with an average engagement rate of 329 impressions per post, and a peak engagement of 714 impressions. On LinkedIn, the professional page has attracted 369 followers, with an average engagement of 319 impressions per post, and the most successful post reaching 1158 impressions. Complementing digital outreach, events including

the IGNITE Ideation Expo and the IGNITE Celebration have been pivotal in convening innovators and key industry figures with students - recording attendances of 42 and 60 respectively. In collaboration with prominent campus groups like the Florida IP Alliance, Warrington Ventures, and Nucleate Florida's Gainesville chapter, IGNITE has successfully co-hosted a variety of events that have fostered community engagement and enriched our campus culture. One networking series, "Build Your Network, Build Your Team," stands out as a collaborative effort with Blackstone Launchpad, Nucleate Florida, and Warrington Ventures, which has been instrumental in connecting students with valuable networking experience and fostering team-building opportunities.

Faculty Service

- The Institute continued Skills-Builders Module training in collaboration with the Engineering Leadership Institute. These 1-hour, turnkey Modules are offered to faculty to supplement their courses across all College of Engineering departments. In this fiscal year, 509 engineering students in total received these materials, with EII faculty delivering Modules in Innovation and Creativity, A Global View of Innovation, and Elevator Pitches to 248 engineering students.

- EII continues to support college faculty in commercializing the results of their research. In this year, College of Engineering faculty research resulted in 84 inventions and 34 technology license agreements with industry. The Institute provided a detailed 5-year intellectual property assessment for each department to the granularity of the individual PI in support of the Dean's Advisory Board and departmental evaluations and IP strategy assessment.

- EII worked with HWCOE Advancement in benchmarking and designing a renewed Corporate Engagement program in spring 2023, the results of which are being implemented in the coming year. The program was administratively moved within EII late spring so the annual results will not be detailed here other than to say that the EII Executive Director mentored and guided the current Associate Director in building key industry collaborations throughout the year, including with Verizon, AT&T, Next Era Energy/FP&L, Accenture, Procter & Gamble, Ford Motor Company, Walmart, Michelin, Duke Energy, and Vobile.

- The Institute continues to work closely with Dr. Elif Akcali (UF Industrial and Systems Engineering), who became an EII Affiliate Faculty member last year and the Michael Durham Professor of Creativity this year, as we continue to support several of her proposals to federal agencies around creativity and divergent thinking. Dr. Akcali worked closely with the IGNITE Creativity program described below in workshops involving College of Fine Arts and College of Engineering students and faculty, informing her research. EII faculty member Dr. Melissa White serves as Affiliate Faculty in the UF College of the Arts / Center for Arts, Migration and Entrepreneurship and provides a critical link across campus and the region's innovation community.

Outreach through Innovation Station - Sarasota County (UFIS-SC)

- This fiscal year, UFIS-SC staff connected with over 60 companies to explore the potential for internships, research and other student engagements. This resulted in 84 internships and eight full-time positions filled at 33 Sarasota regionally based companies / organizations. Through the efforts of UFIS-SC, 384 interns and 49 full time hires cumulatively have been placed with 95 host companies since the program start.

- With an additional 24 students beginning in fall 2023, a total of 107 students have enrolled in critical need degree programs such as computer science, electrical and computer engineering, and mechanical and aerospace engineering through the Gator Engineering at State College of Florida program since its inception.

- In K-12 activities, UFIS-SC staff interacted with 845 K-12 students in highlighting career opportunities in engineering disciplines. This was the third consecutive summer of computer science camps in Sarasota County with three sessions in 2023 led by district teachers and assisted by a UF engineering student. Also, two Sarasota County teachers completed summer Professional Development at UF-Gainesville and received stipend, travel, lodging and compensation.

- Six UF Engineering faculty from various engineering departments including Aerospace, Biomedical, Chemical, Digital Arts and Sciences, Mechanical, Nuclear participated with engagements and individual student visits. Additionally, five UF student groups participated in virtual activities and workshops for more than 200 elementary, middle, and high school students as well as individual student meetings and campus visits.

- UF Biomedical Engineering faculty secured NSF funding for a Becoming Tissue Engineers program set to include regular outreach to Unidos Now. Also, Suncoast Polytechnical High School Biomedical Engineering program will incorporate UF-based Biotechnician Assistant Credentialing Exam.