# TUEE Collaboratory Two-Year Plan
# for Comprehensive Pilot Implementation AY 2022-2023

November 28, 2021

GOAL: By June 2022, to develop the elements for a comprehensive engineering education pilot to be implemented in AY 2022-23 that will serve as a model for transforming undergraduate education in engineering/computing TUEE.) It will employ a uniquely empowering student-centered, active learning model intensively engaging practicing professionals in providing mentoring and coaching in a wide variety of student experiences *throughout* the undergraduate engineering education experience. In such a program, students would have the opportunity to realize their full potential and acquire the technical and professional attributes and skill sets to be fully prepared to succeed immediately upon entering the ever-changing technical workplace. Upon implementation during AY 2022-23, it appears that this may be the only transformational comprehensive model in practice at a large university in the next 3-5 years.

- Conduct the creation, planning and development for the pilot program elements from the present through June of 2022
- Implement the comprehensive pilot program throughout AY 2022-23
- Implement a comprehensive exemplar program scaled to at least 2-3 times the size of the pilot throughout AY 2023-24 along with adding additional majors and other programs that are expected to be created prior to June 2023

ACTIONS present through early February, 2022:

To undertake the feasibility assessment necessary to begin pilot program planning and development with a "go/no go" decision by February 8, satisfactorily complete the following:

- Identify 1 lead university to implement a comprehensive pilot in AY 2022-23.
  - A large university that has an ABET accredited engineering/computing program with a strong capstone senior design program and a strong first-year program in place. Focus would be on establishing second- and third-year projects and programs by June 2022 in preparation for implementing the comprehensive pilot in AY 2022-23.
- Begin preliminary discussions with 3 companies re: becoming a Strategic Corporate Partner (SCP) with a university
  - Identify major companies that would consider an invitation from the lead university to be a SCP to participate in establishing the Councils

- By February 8, 2022, the university would immediately invite 3 companies to be founding SCPs for their program.

- By mid-spring 2022, the SCPs would begin participating with students, faculty and staff to start the planning and development phase.
- 3-5 additional companies invited to participate as SCPs by spring break 2022
- By February 8, 2022, student leaders (8) identified (from ACM, ASME BMES, IEEE, AISES, NSBE, SHPE, SWE,) to participate with faculty, staff and SCP representatives in developing the councils and recruiting a student cohort of at least 40 high potential, low income, second- and third-year honors students by spring break 2022
  - GPA 3.0 or higher
  - Majoring in selected engineering fields or computer science (Suggest CS, EE, ME and BME initially)
  - Active member of student chapter of national professional societies (ACM, ASME, BMES, IEEE) and/or diversity organizations (AISES, NSBE, SHPE, SWE)
- Faculty representatives selected for Faculty Professional Practice Council (FPPC)
  - Lead faculty member with two supporting colleagues from each major field by February 8, 2021
- Corporate representatives from 3 founding SCPs selected for Councils by February 8, 2021
  - Lead representatives determined from the following roles: campus executive, campus manger, technical manager, recruiting manager, diversity officer
- Program Councils: TUEE Executive (TEC), Faculty Professional Practice (FPPC), Student Professional Practice (SPPC) and Student Diversity Solutions (SDSC) created by February 8, 2022
- *A final go/no go decision made by February 8, 2022* to proceed with the project
- By February 18, 2022, each Council will hold a 2-hour in-person or virtual meeting for all stakeholders to include overview for 45 minutes followed by at least 1 hour to address possible activities.

ACTIONS through June 2022

- Councils plan and develop activities and projects to be conducted during the development phase through spring 2022 and implementation of the pilot AY 2022-2023 (externships, internships, projects, activities and events.)
- Finalize planning and conduct the Inaugural Day on Campus with Strategic Corporate Partners to take place in the week of February 28, 2022 (see DwCP attachment) when all stakeholders meet together on campus for the first time.
- The university will select at least two partner community colleges (ideally Minority Serving Institutions (MSIs) with strong STEM programs who are current feeders)
  - Community colleges will implement/participate in similar first- and second-year programs as the university students including a second-year sponsored design project and the council structure
  - Partner community colleges will be principal sources of students for the Transfer Students Scholars program at the university
    - Select 12 Transfer Scholar finalists

- At Inaugural Day on Campus with Corporate Partners, 12 Transfer Scholars Finalists will attend the event
  - about four finalists awarded full tuition scholarships.
  - All finalists will be eligible to interview with SCPs for summer internships.
  - Transfer Scholars and enrolled finalists will be assigned a SPPS peer mentor for the 2022 fall semester
- "Academic Skunkworks" environment established on campus for conducting the development phase through June 2022 and implementing the comprehensive pilot through June 2023 and beyond. The "Academic Skunkworks" functions as an autonomous entity. *All currently scheduled courses, student programs and events throughout THE UNIVERSITY should be carried out as planned through June 2023*
- Ten-week sponsored design projects for third-year students (possibly second-year students also) would be conducted during spring 2022
- Externships, ideally team externships, for first- and second-year students with SCPs during Spring Break

ACTION for summer 2022

- Student internships with about 10 SCPs and at least 10 prospective SCPs for rising sophomores, juniors and seniors, including summer team internships for rising seniors, possibly rising juniors

ACTION for AY 2022-23

- Implement full comprehensive pilot at both campuses (see attachment for description of AY 2022-2023 pilot)
- Councils will include additional majors and create additional types of projects and other activities for implementation in AY 2023-2024

ACTION for AY 2023-24 and beyond

- Scale pilot to at least 2-3 times the size of AY 2022-23 pilot to include at least 20 SCPs and 300 students per campus along with additional majors and other programs that are expected to be created prior to June 2023
- Pilot versions of centers and/or institutes would be implemented AY 2023-24
- The "Academic Skunkworks" notion, as with Lockheed and its original skunkworks, will be maintained and refined at both universities into the future
  - to facilitate and conduct scalable and sustainable innovations required of engineering education, such as:
    - to include graduate education and sponsored research
    - to include global projects and other collaborations with universities and industry, for example, global, full-year, sponsored capstone projects undertaken by teams of three U.S. university students and three foreign

university students who collaborate to solve a problem for a sponsoring company

- Collaborate with a wide range of new strategic partners throughout the education ecosystem in addition to founding Strategic Corporate Partners, local chapters of national professional societies and diversity organizations