

THE UNIVERSITY OF TEXAS SYSTEM

ENGINEERING EDUCATION FOR TEXAS IN THE 21ST CENTURY

BACKGROUND

The State of Texas maintains a vibrant economy by creating new jobs and attracting companies that compete on a national and global scale. Although Texas institutions of higher education today produce some of the finest and best-qualified graduates each year, the state's economy is at risk because of a critical shortage of engineers and computer scientists. To maintain the state's competitive edge, higher education institutions must produce more engineering and computer science graduates.

The Texas Workforce Commission estimates that Texas will require nearly 88,000 more engineers and computer scientists over the next decade, or approximately 9,000 more university graduates entering the field per year. To address this challenge, The University of Texas System Board of Regents in 2012 formed the **Task Force on Engineering Education for Texas in the 21st Century**.

RECOMMENDATIONS AND PLAN OF ACTION

The task force made several recommendations including:

- Increase the production of engineers and computer scientists in Texas by 50 percent within a decade. This would increase the number of bachelor's degrees in engineering and computer science from UT institutions from 3,000 per year to 5,000.
- Motivate and inspire more young Texans to pursue engineering careers by strengthening the K-12 pipeline. Universities need to attract students in high school to engineering and computer science by raising awareness of the opportunities in these two attractive fields of study.
- Develop efforts to partner with industry leaders, particularly in Houston – the energy capital of the nation – to enhance research collaborations and educational opportunities for students through co-op programs and internships.

UT System's plan of action to achieve these recommendations includes the following items:

- Develop the University of Texas Energy Research, Engineering and Education Institute (UT EREEI) in Houston, a public/private partnership between UT System, UT institutions, energy corporations, and the state and federal government.
- Create "UTx Engineering," an online dual-credit program allowing students to earn college credit in engineering and computer science preparatory courses while still in high school or attending a community college.
- Aggressively recruit faculty to rapidly increase enrollment in engineering and computer science majors across the UT System.
- Focus state-supported facilities construction and renovations on classrooms and learning laboratories used by students in engineering and computer science.
- Improve and increase internships and co-ops that directly connect students with industry, as developing more opportunities to practice engineering while pursuing an undergraduate degree will benefit students.
- Develop greater ties to industry to spark support for faculty and to provide resources for research and hands-on educational opportunities.

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UT SYSTEM COMMITMENTS

The UT System already has committed the following funding for this effort:

- The UT System Board of Regents allocated an initial investment of \$2 million to establish the UT EREEI in Houston.
- The Board also allocated \$10 million per year for the next two years in funding for the successful STARS (Science and Technology Acquisition and Retention) program to fund the purchase of equipment and renovation of facilities to help recruit and retain outstanding engineering and computer science faculty.

UT SYSTEM REQUESTS

- \$10 million per year in “start-up” funding from the Texas Legislature to help recruit new engineering and computer science faculty for UT institutions.
 - This funding would be modeled on the very successful Texas Research Incentive Program (TRIP). The funds, which would be appropriated to the UT System, would go only to institutions that match private philanthropic support for the recruitment of faculty.
 - The funding would be needed for only two years, after which the formula funding attached to the increased number of enrolled students would support the faculty salaries and other costs.
- State support for facilities construction and renovation through authorization and funding of tuition revenue bonds or other direct appropriations.
 - Funding would be used to build classrooms and laboratories for engineering and computer science students.

RETURN ON INVESTMENT

To meet the future needs of the state’s economy, the UT System requests:

- There will be an enormous return on investment for students – whose lifetime earnings will typically soar in the engineering field – and for Texas as a whole. The UT System engineering initiative, if implemented successfully, would represent the most significant investment in engineering education in the United States in recent years and would attract even more qualified people and businesses to Texas.