$12.5 Million National Science Foundation Grant Funds
UTeachEngineering Program for Educators

In 2008 the University of Texas at Austin's Cockrell School of Engineering, College of Natural Sciences and College of Education were awarded a 5-year, $12.5 million program from the National Science Foundation (NSF) to prepare educators to teach engineering to high-school students.

This grant builds on the university's successful UTeach program to create a model for preparing high school engineering educators called *UTeachEngineering*. David Allen is a chemical engineering professor and the principal investigator for the newly developed program. Texas is one of just a few states aggressively pursuing year-long high school engineering courses, and the effort here will help define how other states approach engineering education in high school.

The Austin Independent School District will partner with the university in developing and evaluating UTeachEngineering, which commenced in summer 2009. More information is available at http://www.uteachengineering.org.

The UTeachEngineering program targets both future and current teachers, providing multiple avenues to prepare them to teach high school engineering. University faculty will use half of the five-year grant funding for course development, lab development and salaries. The other half of the grant will provide stipends, scholarships and fellowships to students and teachers working toward engineering teaching certification.

Current teachers benefit from two curricula developed through the grant: a six-week Engineering Summer Institute for Teachers and a UTeach Master of Arts in Science and Engineering Education, which takes place over three summers. The curriculum for prospective teachers will target undergraduate students in engineering and the natural sciences, and lead to a bachelor's degree in a scientific or engineering field as well as dual teaching certification in science and engineering. Addressing the need for trained engineering teachers is especially crucial in Texas because of a new law that requires high school graduates starting in 2011 to complete four years of science. One year can be a course in engineering.

In its first five years, UTeachEngineering will affect 650 teachers. Allen and his team have made a concerted effort to recruit Hispanic and African American participants, particularly in urban centers and the Texas-Mexico border area. Stipends and fellowships were awarded to current teachers and scholarships awarded to undergraduate students.

The grant allows researchers a real chance to advance the understanding of effective teacher preparation and development, while also making significant advances in addressing critical shortages of highly qualified professionals in science, technology, engineering and mathematics-related K-12 education.

Key to the UTeachEngineering program are four new engineering courses focusing on engineering content and pedagogy: Fundamentals in Engineering and Design, Knowing and Learning in Engineering, Engineering Energy Systems and Design of Machines and Systems. In addition to the four new courses, the UTeachEngineering program will leverage existing curricula from the original UTeach, which began in 1997 as a way to prepare a new generation of

secondary math, science and computer science instructors. It has become a national model and is being replicated at a dozen universities nationwide.

The other co-principal investigators include: Richard Crawford, mechanical engineering professor; and Michael Houser, assistant superintendent for human resources development and information systems for the Austin Independent School District.