UTEP College of Engineering Receives a 200,000 NSF Grant to Help Fund Cyber Tutor System

The Departments of Industrial Manufacturing Systems Engineering & Mechanical Engineering at The University of Texas at El Paso were awarded a $200,000 National Science Foundation (NSF) grant that will help fund a project titled, “Fusing Rapid Manufacturing with 3D- Virtual Facility and Cyber Tutor System into Engineering Education to Cultivate Technical Success.”

Intended to support undergraduate Science, Technology, Engineering and Mathematics (STEM) learning environments, through Cyber Based Manufacturing (CBRM), the proposed two-year project will not only prepare students for the needs of industry but also promote advanced manufacturing technologies in higher education.

According to Associate Professor Bill Tseng Ph.D., the collaborative effort between the IMSE and ME department at UTEP aims to improve curriculum relevant to serving the student populations of both departments.

“By bringing rapid manufacturing coursework into engineering education and it will boarded the impact to a national level,” Tseng said.

Being one of the fastest growing businesses in the manufacturing sector, CBRM is expected to become a significant activity in coming years, especially with the trend of rapid globalization across all types of manufacturing industries.

Successful execution of the TUES Type 1 project can result in the improvements in four different areas such as: (1) Online facilities will enable multiple institutions to share expensive lab resources, hence providing their students access to more sophisticated concepts and lab experiences; (2) The reduction of potential injuries and safety hazards; enhancing facility training for the students can be achieved through virtual exposure to the equipment; (3) A large number of students can be enrolled in the lab courses without extra demands on equipment and increase in faculty numbers; (4) Students will be able to decompose and manipulate virtual facility to learn more about functionality, maintainability and reliability concepts which are almost impossible for the real facility; and (5) It will be easy to disseminate and utilize our
virtual facility through online lab courses to other universities.

“This project will immerse students in innovative and transformative learning. The proposed curricula will result in well-prepared students with high-tech skills in the areas of automation, production and rapid manufacturing technologies-creating a nation model for teaching network-based manufacturing,” Tseng said. “Diagnosis and control of distributed manufacturing operation are the key characteristics on the delivery of the curriculum, along with the involvement and hands-on experience from the Virtual Facility (VF) with embedded tutor system implementation.”

Graduates from the program will be well prepared with high-tech skills in the areas of rapid and advanced manufacturing technology.

“Through the use of the VF, users (students) will not only learn about additive manufacturing but how to operate the Rapid Prototyping Machine with 24 hour access plus smart/intelligent machine capacity,” Tseng said. “Without the fear to break the expensive facility and enjoy playing with the Cyber Facility system.”

It is expected that nationally this curriculum reform will become a national model of teaching cyber based rapid manufacturing technology in STEM programs, while locally it will provide much of the needed manufacturing professionals for the industries residing in the Greater El Paso Region.

By Andrea Acosta