

Science, Technology, Engineering, and Math (STEM) Programs

Several of Kirkwood's Science, Technology, Engineering, Math and Computer Science projects are funded with grants from the National Science Foundation and the U.S. Department of Agriculture (USDA).

AgrowKnowledge: National Center for Agriscience and Technology Education

Kirkwood's AgrowKnowledge Center has received approximately \$1 million annually from the National Science Foundation's Advanced Technology Education program since 2000. The Center's work focuses on preparing students for technological careers in Agriculture, Food, and Natural Resources (AFNR); and supports curriculum development, faculty development and capacity building. AgrowKnowledge partners include Agriculture Technology Education teams in 16 community colleges, six associate colleges, local secondary programs, a four-member University Council, and an active Industry Council.

The intellectual merit of the center's comprehensive program is expressed through curriculum and faculty development activities to ensure that foundational courses in science, mathematics and technology are an integral part of agriculture technology education. The broader impact of the center is represented by students who are better prepared when they begin working in increasingly technical AFNR careers, or pursue advanced degrees in specialized areas of agriculture science and business; biotechnology; natural resource management; and related fields. More information: www.Agrowknow.org



The Agriculture Geographic Information Science (GIS) Learning Application Center

Kirkwood and Midwest partners received a \$40,000 grant from the U. S. Department of Agriculture's Cooperative State Research



Education and Extension Services (CREES) to support an Agriculture Geographic Information Science (GIS) Learning Application Center. The project's goal is to teach advanced geospatial analytical skills and introduce students to

knowledge they need for employment in the high-technology Precision Agriculture Industry. The program's objectives include the development of two courses in GIS practices; improving AgrowKnowledge partners' teaching competencies; preparing teaching aids and technical assistance; and promoting and arranging contacts among community colleges and the Precision Agriculture Industry. More information: www.agrowknow.org.

STEPS to Bridge the Way

Kirkwood received a three-year, \$499,960 grant from the National Science Foundation's Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP) initiative to improve the recruitment and retention of qualified students who can successfully complete a program in a science, technology,



engineering, or mathematics (STEM) discipline. The project provides "bridge" scholarships and support activities for students that enable them to complete a seamless transition from high school to Kirkwood and continue on to a four-year degree program through 2+2+2

articulation agreements. Project partners include the Iowa City and Cedar Rapids metro school districts, the area education agency, The Workplace Learning Connection, and colleges and universities involved in the development of articulated programs.

Kirkwood's STEP summer workshop for faculty facilitates discussions about the identification, recruitment and retention of qualified STEM students; expectations for student learning in STEM courses throughout the continuum of education; effective pedagogy; and the use of technology in the classroom. In addition, high school students may explore STEM opportunities during a separate Summer Bridge program at Kirkwood.

The project's intellectual merit is reflected in the integrated efforts within secondary and post-secondary education to increase student interest and improve student success in relevant and rigorous STEM courses. In addition to financial assistance, the project provides academic support, career exploration, tutoring and mentoring. The project's broader impact is realized through the coordinated and cooperative response by Kirkwood and partner high schools to projected job growth in STEM-related jobs in Kirkwood's service area. This regional effort addresses the national concern about the declining number of U.S. students who succeed in STEM courses and pursue STEM careers.

Technology Scholars Program

Kirkwood received a four-year, \$400,000 grant from NSF's **S-STEM Program (Scholarships in Science, Technology, Engineering, and Mathematics)**



to support the recruitment and retention of students into computer science, engineering and mathematics fields. The project provides up to \$3,125 in annual scholarship support for each academically qualified student interested in a STEM course of study. Students in this program who complete their education at Kirkwood may enter the workforce or transfer to a four-year college or university.

STEM programs at Kirkwood include: Pre-engineering (transfer); Computer Science (transfer); Mathematics (transfer); CAD/Mechanical Engineering Technology (MET); Electronics Engineering Technology (EET); Computer Programming (Mainframe, iSeries, PC/Internet), Science and Math.

Kirkwood's technology scholars create and maintain a Personal Growth Portfolio (PGF); meet regularly with faculty advisors representing STEM technology areas; have opportunities to meet with industry representatives; and participate in a required Technology Seminar each semester. The seminar provides a structure for students' systematic

exploration of learning outcomes and the connections between academic work and careers.

Terrorist Agent Control Technology

(TACT) was funded by the National Science Foundation in 2003 to support instructors preparing college students in agriculture, industry and municipal services to assist their future employers to prepare for, control and respond to a terrorist attack. A series of five online credit courses have been developed and are used by community colleges and universities across the country. They include:

Perspectives on Terrorism:

Is terrorism a new concept? What can be done to prepare? What is the psychological impact of terrorism? These and other questions are answered as students explore the many perspectives on terrorism.

Biological Agents of Terrorism:

From an outbreak of smallpox to a citywide case of botulism, students identify potential biological agents, examine their impact and review appropriate response plans.

Chemical Agents of Terrorism:

Industrial chemicals as well as military agents that pose a threat to our security are detailed as the student examines the effects of these potential agents of terrorism.

Facility Security and Deterrents to Terrorism:

A terrorist attack can be internal or external; from these two extremes, students identify how to safeguard their infrastructure, minimize the likelihood of attack, and how best to recover after an incident.

Terrorist Agent Monitoring and Detection:

From continuous monitoring to sampling for and detection of a suspected agent, students explore worlds of PID, IR and GC Mass Spectroscopy, Immunofluorescence, and PCR Technology.

More information: www.et-online.org or www.hmtri.org.

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