

Alumni Newsletter • Fall 2004 • Volume 12

## IEDT joins forces with agricultural and biosystems engineering



July 1, 2004, marked the beginning of a new era for the industrial education and technology program (IEDT) at Iowa State University. Following approval by the Board of Regents, State of Iowa, the department merged with another technology-intensive program—agricultural and biosystems engineering

(ABE). With the merger, the Department of Agricultural and Biosystems Engineering now has more than 500 undergraduate and 80 graduate students.

“The combination allows us to more efficiently use fiscal and physical resources,” says Roger Smith, professor and interim chair of IEDT during 2003–2004. The merger increases the number of faculty working with students and broadens the technology expertise available.

“Both programs focus on the application and integration of technology,” says Ramesh Kanwar, professor and chair of ABE. IEDT concentrates on manufacturing and occupational safety and ABE on agricultural and environmental systems technology, management, innovations, and safety systems.

For Tom Barnes, owner of Barnes Manufacturing Services in Marion, Iowa, and IEDT alum, the merger bodes well for students and the manufacturing industry. “Two years ago I brought a prospective student to campus. We looked at both the ag systems technology and industrial technology programs. The many similarities make the merger a good fit, and it makes us a bigger and stronger department.”

IEDT courses and programs will remain the same, at least until the new catalog goes into effect with the 2005–2006 academic year. “New students will be accepted into the industrial technology major,” stresses Smith, “and the curriculum will retain its vibrancy as it moves forward.”

A modification of two existing undergraduate majors, agricultural systems technology and industrial technology, is under consideration. A committee with representatives from both programs has proposed a combined major—agricultural and industrial technology—with four options: management systems, industrial systems technology, occupational safety technology, and biological systems technology. No changes will occur without the review and approval of departmental

and college curriculum committees as well as the Faculty Senate. Students in either major will have the opportunity to complete their programs.

This fall, the most noticeable change concerns college affiliation. IEDT had been part of the College of Education since 1968. Now, because ABE is jointly administered by the Colleges of Engineering and Agriculture, IEDT students, faculty, staff, and alumni are affiliated with those two colleges.

The return to an agricultural/engineering base is a move that IEDT alumni should appreciate as well, according to Barnes. “This merger gives us an opportunity to really focus on technology and manufacturing, and that should make us more competitive with outstanding programs across the country,” he explains.

And being among the best, Barnes adds, is a great way to encourage loyalty among alumni. ♦

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## Merger—An opportunity of a lifetime



Welcome to the fall 2004 IEDT newsletter. On behalf of the Department of Agricultural and Biosystems Engineering (ABE) faculty, staff, students, and alumni, I welcome the merger of the IEDT program and you, the alumni with ABE. This merger of the only two engineering technology programs on campus provides us an opportunity of a lifetime to be one of the best technology programs in the nation and meet emerging needs of Iowa's industry. This fall's *U.S. News and World Report* ranked our agricultural engineering undergraduate program No. 3 in the nation. This ranking reflects the success of our students and alumni and the accomplishments of the ABE faculty. This merger will lead to new programs and create new opportunities for our students in the 21st century.

Thanks to all of you who supported us through the merger process. I look forward to your continued support as we strive to make our programs even better. While this is the final IEDT newsletter, the ABE newsletter will now keep you up-to-date on departmental news. Please stop by if you are in Ames, and we will be happy to give you a tour of our department!

Ramesh Kanwar  
ABE Professor and Chair

## Researchers study safety issues for farm youth

Children in farm families often participate in agricultural chores such as feeding livestock and general maintenance tasks that require lifting and carrying loads. Parents assign tasks like these because they are relatively safer than operating tractors and field equipment. Load-carrying activities, however, pose their own risks in sprains and strains as children resort to inappropriate carrying techniques or negotiate weights that are disproportionate to their builds.

“Studies have shown that overextension is a frequent cause of injury for children working on farms,” says Steve Freeman, who is collaborating with a multidisciplinary team of researchers on a grant from

the National Institute for Occupational Safety and Health to study farm-related injuries to children. Charles Schwab, an associate professor in agricultural engineering, is the project’s lead investigator. Other researchers include Timothy Derrick and Jason Gillette, faculty members in health and human performance.

National statistics show that agriculture uses about 4% of the labor force but accounts for 25% of the most severe child work injuries. “Agriculture work by children may involve abnormal loads on a repetitive basis, such as transport of feed to livestock areas,” says Freeman.

The Iowa State study, involving 88 volunteers (ages 8 to 17) from Iowa’s

4-H clubs, will focus on specific questions such as whether or not it is better for certain age groups to carry one five-gallon bucket or distribute the weight by carrying two one-gallon buckets in each hand. By determining the impact of these separate activities on posture and the joints and spines of different age groups, researchers hope to be able to better



Researchers use biomarkers to help determine impact of loads on posture and joints.

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## Graphics technology takes on new dimensions

High-school and college product design and technical graphics courses use computer-aided design (CAD) models to help students understand complex parts and the spatial relationship between components. Now an innovative virtual reality (VR) software tool, developed by Shana Smith and graduate students in the industrial education technology program, can transform these CAD models into 3-D stereoscopic images. It gives students additional flexibility to rotate and view parts, even areas that often remain hidden on a flat screen.

While the VR CAD model enhances the visualization process, the low cost and the ease by which CAD can be imported into the system make it unique, according to Smith. The model was put to use in Smith’s IEDT class last year. Students wore 3-D glasses to view images projected on the screen, and, using a data glove device to “feel” the image, they rotated and examined it from all angles.

Smith’s research on the software program began two years ago as part of a Miller Fellowship Grant. In fall 2003, she received a three-year \$860,000 National Science Foundation Advanced Technology Education grant to further develop and test the software program in the classroom. Co-researchers are Ann D. Thompson, director of curriculum and instruction in the College of Education, and Adrian Sannier, professor of industrial and manufacturing systems engineering and associate director of Iowa State’s Virtual Reality Applications Center (VRAC).

To date, Smith has completed four pilot tests in industrial technology classrooms at Iowa State, Des Moines Area Community College, and Iowa Central Community College. In the test phases, students use VR tools to sketch models, create mechanical parts with complex geometries and motions,



Summer camp for high school students provides a first-hand look at VR technology.

draw objects in 3-D space, and use the 3-D system as a visual feedback tool to revise and adjust a specific design.

This past summer, Smith collaborated with VRAC to organize a summer camp for high-school students. The goal was to encourage 9th- and 10th-graders, specifically females and minorities, to explore career options in graphic design and graphics technology by giving them hands-on experience with VR. The participants toured VRAC and were introduced to VR concepts and how the technology can be used to improve everyday life and products. They constructed Lego models and then transformed them into 3D representations using computer-aided modeling software and Smith’s low-cost VR system.

Ultimately, Smith’s goal is to create instructional material that will enhance course delivery and make it available to design and technical graphics teachers through the Internet or on CD-ROMs. She plans to present her results and successes through national conferences, presentations, and publications. ♦



## Changes in store for Roger Smith

Long-time IEDT faculty member Roger Smith is entering this fall with mixed emotions. Smith joined the

faculty as an assistant professor in 1977 to teach graphic communications. Over the last 27 years, he has seen lots of changes in the department: the growth of the undergraduate program to 230 students, graduation of 160 PhD students, construction of a “new” building, Industrial Education II, and the demolition of old Building “O,” and now the merger with agricultural and biosystems engineering (ABE).

“This is a time of great opportunity,” Smith says. “Industrial technology faculty now have a chance to work with a large group of excellent ABE faculty who can support their

research and interact with them to enhance their teaching.”

During his tenure at Iowa State, Smith has served in a variety of roles. In 1997, he became IEDT department chair, and in 2001 he assumed full-time duties as associate dean of the College of Education. Even though he worked in the dean’s office, he taught computer-aided design and worked with graduate students as the co-director of the IEDT graduate program. In spring 2003, he again served as interim chair to assist with the department merger and the NAIT accreditation.

Continuing in his role as associate dean in the College of Education, Smith retains his tenure in education rather than moving to the College of Agriculture. “I still have much to contribute to IEDT students and faculty and hope that they will let me work with them,” he explains.

Smith anticipates a courtesy appointment in ABE so that he can still occasionally teach there and work with graduate students. “I have spent my entire life working in industrial technology, and I can’t change my passions now,” he observes. “I will miss the great students that we have had, and the faculty members are my friends. There is no way that I could not be a part of this great group.” And while Smith will continue to be part of the IEDT professional organizations, he says he will miss day-to-day contact with students the most.

“The students, alumni, faculty, and staff of the College of Education have very much enjoyed their connections with people from IEDT,” says Smith. “Although many of our formal ties are being cut, IEDT people will forever hold a special place in our hearts.” ♦

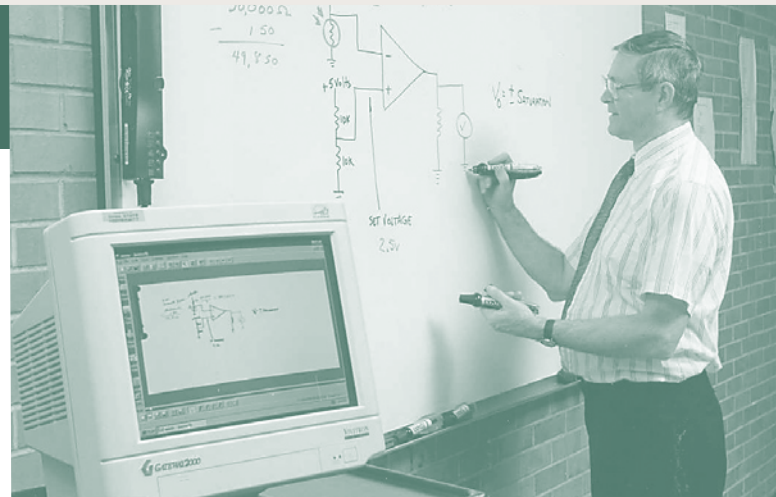
## Larry Bradshaw ends career dedicated to students

For the last 40 years, students have played a big part in Larry Bradshaw’s life. And it’s the students he’ll miss most in his retirement that began July 1. That’s no surprise to those familiar with Bradshaw’s career.

After earning his BA and MA at the University of Northern Iowa, Bradshaw taught photography and electronics and coached cross-country and track in the Cedar Rapids school system. When he came to Iowa State, he wore two hats: he was a PhD student and an assistant professor in graphic arts. He completed his degree in 1984 and taught electronics in IEDT for the next 20 years.

Throughout his teaching career, Bradshaw has demonstrated his keen interest in his students and in international development. While living in Cedar Rapids, he worked one summer in Ecuador installing a radio transmitter and another summer in Nepal working under USAID. While on sabbatical, he and his family spent a year on Papua New Guinea.

After coming to Iowa State, Bradshaw went on a trade mission to Korea, and the following summer he took seven Iowa State students to Korea where they worked at LSY, a printing company. On a Fulbright Scholarship, he spent six months working in Cyprus under the Ministry of Education.



Bradshaw has served on numerous master’s and doctoral committees for international students; was a member and officer for Phi Beta Delta, an international fraternity; and was advisor for the Singapore Student Association for many years. In recognition of his contributions, Bradshaw received the Laureate Citation from Epsilon Pi Tau, the international professional fraternity for education in technology, and was named outstanding instructor in District Four for NAIT.

Although he won’t be in the classroom, Bradshaw and his wife, Glenda, plan to spend much of their retirement time helping others, primarily with the American Red Cross and Wycliffe Bible Translators. ♦

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## Scholarship recipients for 2004-2005

Thanks to the continuous generous gifts of corporations, alumni, and friends of industrial education and technology, nine students have been awarded scholarships for the 2004-2005 academic year. Congratulations to these award winners:

**Anselmo Raya**  
Des Moines, Iowa  
Lowell Carver Scholarship

**Kristen Watters**  
Estherville, Iowa  
IEDT Faculty Scholarship

**Adam Wilcop**  
Rockford, Illinois  
Dorothy M. & David C. Tuttle Scholarship

**David Hoffa**  
Lebanon, Pennsylvania  
Trevor G. Howe Scholarship

**Mark Holzman**  
Remsen, Iowa  
Charles Iler Scholarship

**Mike Murphy**  
Sioux City, Iowa  
Vermeer Scholarship

**Sam Hurst**  
Boone, Iowa  
IEDT Alumni & Friends Scholarship

**John Brincks**  
Carroll, Iowa  
Albert M. Sherick Scholarship

**Daniel Medina**  
Aguadilla, Puerto Rico  
Vermeer Scholarship

### *Farm Youth continued from page 2*

assess injury risks and offer safer options for completing tasks.

Research on body and joint movements will be conducted at Iowa State's Biomechanics Laboratory in the College of Education. Students will pass through three stations of assessment. The first station will collect demographic, health, and occupational history information. The second station will measure the participants' physical dimensions. At the final station, a special camera system and force platform will

measure participants walking eight meters while carrying one bucket or two buckets with different loads.

Freeman says families will benefit by being able to determine the risks of particular chores and identifying appropriate carrying procedures and limits based on a child's physique. Ultimately, researchers hope to develop safety-training materials for farm parents and employers. ♦