

Guest Comment

Science, Technology, Engineering and Mathematics (STEM) Undergraduate Education at the University of Northern Iowa

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ABOUT THE UNIVERSITY OF NORTHERN IOWA

For the seventh consecutive year, the University of Northern Iowa (UNI) is ranked second in the Midwest Region's Top Public Universities Master's category, according to *U.S. News & World Report's* Year 2003 America's Best Colleges. The magazine's ranking uses various criteria including academic reputation, student retention, faculty resources, student selectivity, financial resources and alumni giving rate. The fall 2003 enrollment at UNI is 13,500, out of which nearly 60% are female students.

ABOUT THE COLLEGE OF NATURAL SCIENCES

The College of Natural Sciences (CNS) at Northern Iowa enrolls nearly 2,000 students majoring in STEM disciplines, and awards about 350 baccalaureate, master's and doctoral degrees annually. According to the 2001-02 Graduating Senior Survey, 57% of CNS students were accepted to graduate or professional schools, and 22.8% of them found full-time employment directly after graduation. Other examples of excellence include: our Industrial Technology department is fully accredited by the National Association of Industrial Technology, and houses the only fully accredited doctoral program in Industrial Technology in the nation; according to the well-known Research Corporation ranking, our undergraduate Chemistry program is

ranked 30th out of 1,115 undergraduate programs nationwide.

Providing additional economic development opportunities and enabling full participation in the new economy through greater production of STEM degree holders are significant topics of conversation nationally these days. Here in Iowa, the Iowa Business Council has identified the following three areas as emphasis areas for additional degree productivity, leading to increased numbers of technical workforce and research and technology transfer activities: biotechnology, information solutions, and advanced manufacturing. Consistent with this emphasis, quality STEM undergraduate education in a personalized learning environment is one of the key themes in the UNI mission statement. This means, in particular, that a significant fraction of our students participates in various undergraduate research and internship experience programs, often mentored by faculty members with active research programs. For example, consider the following two indicators of excellence:

- Since 1992, CNS undergraduate students have authored or coauthored over 60 papers in refereed research journals including *American Journal of Undergraduate Research*, *Applied Physics Letters*, *Behavioral Ecology*, *Canadian Journal Botany*, *European Journal of Physics*, *International Journal of Modern Physics B*, and *Physical Review B*;

- Each year, more than 50 students participate in the CNS Summer Research Experience Program for Undergraduates, each working with one or two faculty mentors and producing a research paper.

It is hardly surprising that UNI was one of only 15 universities nationwide receiving the prestigious AAAS-Merck Undergraduate Research Excellence award last year.

Many of our undergraduate students complete their research experience projects concurrently with internship activities sponsored by various research and outreach centers housed in the College:

- The Center for Energy and Environmental Education (CEEE) sponsors student interns to help with energy efficiency studies and water quality projects;
- The Science Center for Teaching, Outreach and Research on Meteorology (STORM) sponsors student interns to help with testing meteorological decision support system software, and air quality studies;
- The Recycle and Reuse Technology Transfer Center (RRTTC) sponsors student interns to help collect data and participate in a variety of

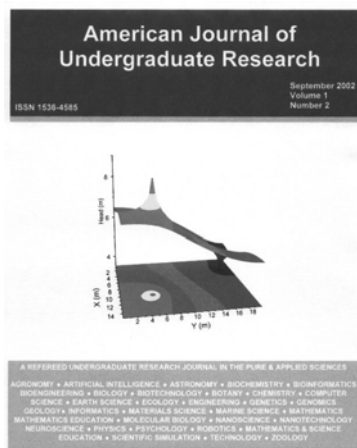
recycling and reuse technology survey projects;

- The Metal Casting Center (MCC) sponsors student interns to help and learn about industrial outreach efforts working with the regional foundry industry;
- The CNS Technology Support Center sponsors student interns to help with a variety of computer technical support activities within the College.

Our goal is nothing short of providing the finest educational experience for our STEM students through individualized instructional assistance and research mentoring! Please visit our website <http://www.cns.uni.edu> to find out more about our programs, and feel free to contact me in case you have additional questions.

Dr. Kichoon Yang is Dean of the College of Natural Sciences, and Professor of Mathematics, at the University of Northern Iowa. He earned a B.S. degree from the University of North Carolina, and a Ph.D. degree from Washington University, both in mathematics. He is the author of 8 books, and has written 18 refereed papers and more than 100 reviews. He can be reached at Kichoon.Yang@uni.edu.

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