Plotting the Waters  Jim Cramer, the data systems coordinator in the Hydrometeorology Laboratory, manipulates a color-coded computer image illustrating research on rainfall and flooding being conducted by Konstantine Georgakakos, associate professor of civil and environmental engineering, and his colleagues. On the screen in the foreground, Cramer has called up a computer-generated map of southwestern Iowa that uses color to reveal the land’s relative elevation, from high (magenta) to middle range (blue and green) to low (yellow). On the elevation map Cramer has superimposed a second map, seen center right on the same screen, which depicts tributary catchments of the Raccoon River as individual blocks of color. The color blocks are keyed to indicate threshold runoff, or rainfall, necessary to cause flooding in each area. For more on Georgakakos’ research, turn to page 4.
Hering to Return to Teaching, Research After Nearly Two Decades as Dean

Inexperienced is what Robert G. Hering says he was when he became dean of the University of Iowa College of Engineering in 1973.

"I went almost directly from being a professor of mechanical engineering at the University of Illinois to dean at Iowa," he recalls. "I was about as green as could be.

Now, almost twenty years later, Hering has announced that he will step down as dean and return to teaching at the end of the 1991-92 fiscal year. As the senior dean at the University and one of the longest tenured engineering deans in the nation, Hering is unquestionably experienced. He has helped Iowa build one of the strongest colleges of engineering in the country, a college that boasts

- a student body that averages in the 95th percentile in ACT scores among all U.S. college freshmen and ranks first, as a group, at the University;
- quality faculty members, three of whom have been elected to the National Academy of Engineering, the profession's highest honor; and
- an enrollment that has more than tripled over the past 20 years, to 1,200 undergraduates, with women making up 21 percent of the total.

Testament to Quality

Perhaps the best testament to the college's high quality is the full-term accreditation that the national engineering education accreditation board granted to each of the school's six undergraduate programs at the last two inspections. Out of nearly 400 engineering programs examined annually by the board, less than 40 percent receive full-term accreditation, the highest possible score.

"For one college to have all six of its programs receive the highest rating is an incredible achievement," Hering says. "It is testimony to the quality of our faculty, students, and programs, because as the evaluation criteria change from year to year, so too must the individual programs within the college change."

The success of the college's research units has been another hallmark of Hering's tenure. The Iowa Institute of Hydraulic Research and the Center for Computer Aided Design have achieved high marks of excellence. The Center for Global and Regional Environmental Research, an interdisciplinary unit established just last year, provides current information on environmental phenomena to policymakers all over the world.

The college also has greatly expanded students' access to up-to-date computer technology by establishing the Iowa Computer Aided Engineering Network (ICAEN). Designed for instructional use by engineering students at all levels, the network provides state-of-the-art workstation technology, including high-resolution, interactive graphics and a full spectrum of engineering application software.

In Select Company

In the field of biomedical engineering, the college has developed a program that offers degrees at all levels and has joined a select company of some 20 institutions nationwide that offer accredited undergraduate programs in biomedical engineering. The Iowa program, which also offers master's and doctoral degrees and maintains close ties to the University's College of Medicine and University Hospitals and Clinics, has changed the composition of engineering at Iowa.

Not only has Hering encouraged the development of research and instruction programs, says Newton Sacks, former chair of the College of Engineering Advisory Board, he also has influenced an important change in the composition of the college's student body.

"One of the outstanding things he did was encourage more women students to enroll in engineering," says Sacks, who received his B.S.E.E. and M.S.I.E. from the college in 1941 and 1969, respectively.

"When I began college, a woman engineer was a rare thing," Sacks says. "Engineering is a marvelous career for a woman. Bob certainly was one of the first people to recognize that."

On the subject of faculty, Hering says that over the past 20 years, the college has been fortunate to have attracted a group of world-renowned teachers and researchers. But this strength seems less the result of good fortune than of careful strategy.

Continued on next page
When looking for potential new faculty members, Hering says, the college searches for high-quality, productive people who will complement its present strengths in theory, computer modeling, and experimentation.

This standard has served the college well, but it is not the only goal Hering has sought to achieve in building a top-notch faculty. He also has worked to recruit women and members of minority groups, mirroring the changing face of the student body and of society itself.

“We have been interested in achieving a diverse faculty,” Hering says, “and over the last two years we have hired three women and one African-American among our new assistant professors. I hope that this trend will continue into the future, even though the competition to hire outstanding women and minority professors is fierce.”

Forecasting future growth and development, Hering predicts that the college will win increasing national and international recognition for all of its programs, both old and new. But some observers view past and future honors as a reflection of Hering’s leadership.

“Bob is an excellent practitioner who has dedicated his efforts to developing the College of Engineering,” says Jim White, vice president for manufacturing at Deere and Company’s industrial equipment division and chair of the college’s advisory board. “Improving the college has been a major driving force in Bob’s personal and professional life. He feels very strongly about engineering education.”

John F. Kennedy, Hunter Rouse Professor of Hydraulics and former director of the Iowa Institute of Hydraulic Research, recently praised Hering at a meeting of the college’s administrative council.

“Under your leadership,” Kennedy said, “every measurable aspect of the college’s performance, be it quality of students, research productivity, level of grant support . . . has been significantly improved. This has been the result of your insisting that we accept no less than the best we could attain and overruling us when we sought to do otherwise.”

Some Goals Yet to Meet

Of course any list of accomplishments must leave a few goals unmet. Hering would like to see construction of a building addition and increased funding for general expenses and support personnel.

“The single biggest disappointment under my leadership,” he says, “has been the inability to expand the college by constructing the Engineering Building addition we so badly need.”

But such disappointments should be tempered by the college’s growth in people and programs despite difficult times, says Sacks, who has served on advisory committees at the universities of Illinois and Wisconsin at Green Bay, as well as at Iowa.

“Bob Hering is an absolute professional,” Sacks says. “The college as it exists today mirrors the work of Bob Hering.”

Characteristically, Hering says that he never could have accomplished his goals without the understanding and support of his wife and four grown children. He also acknowledges the work of Associate Dean Paul Scholz, the college support staff, the engineering faculty, the college advisory board, and the University administration.

“This is an excellent college,” he says. “Nevertheless, the goal should be higher quality.”

Looking toward his own future in engineering education, Hering, whose research field is radiative heat transfer, says, “I’m returning to my roots, to teaching and research.”

by Gary Galluzzo

Student Activities

Neel Kumar (B.S.E. in BME, ’91, now a graduate student) received the Iowa Space Grant College Consortium NASA Summer Undergraduate Research Experience Award, which enabled him to work with UI faculty on NASA-related research.

Kelly Poort (B.S.E. in BME/EE, ’91) received a Distinguished Student Leader Award for the second year in a row and the Susan Hansen award, presented by the University chapter of Mortar Board to the outstanding senior woman, at the annual Finkbine Dinner. Poort also won honorable mention in the 1991-92 National Science Foundation Graduate Fellowship contest.

Chemical and Biochemical Engineering

Faculty Activities

Gregory R. Carmichael, professor and chair, was appointed in July by Governor Terry Branstad to serve on the Governor’s Science Advisory Council.

Carmichael has won a new NASA grant to study ozone in east Asia, and he has served as a member of the science advisory committee on NASA’s Pacific Exploratory Mission, which began extensive field observations of atmospheric chemistry in east Asia last fall.

Last spring Carmichael was invited to Geneva to participate in the World Meteorology Organization experts meeting on the health effects of the Kuwait oil fires. He has developed models to study this environmental catastrophe.

Carmichael and Jonathan S. Dordick, associate professor, have received Carver Scientific Research Initiative Grants. Carmichael is examining the contribution of NO emissions from agriculture on ozone in the Midwest, and Dordick is studying the cloning of archebacterial genes to confer solvent resistance to industrially important organisms.

Continued on next page
Dr. Jonathan S. Dordick, associate professor, has received a grant from the Army Research Office to study improvement of enzyme function in organic solvents through protein engineering. He also has been elected an observer for the National Academy of Sciences at the IUPAC meeting in Hamburg, Germany.

Dordick and Dr. David G. Rethwisch, associate professor, have received a grant from the Sugar Association, Inc., to expand their studies on using enzyme catalysis to make sugar-based polymers. They will examine the combination of enzyme catalysis with traditional polymerization reactions to make water-absorbent or water-soluble materials. Their work was recently highlighted on CNN’s Science and Technology Week.

Dr. Karl Kammermeyer, professor emeritus, has been elected a fellow of the American Association for the Advancement of Science. Kammermeyer was honored for his efforts on behalf of the advancement of science.

Dr. David W. Murhammer, assistant professor, and Dr. David G. Rethwisch, associate professor, co-chaired the biochemical engineering session at the Pan American Chemical Congress, held in September at San Juan, Puerto Rico. Murhammer also accompanied several undergraduate students to Tulsa, Oklahoma, in April to the Mid-America Regional AIChE Student Paper Contest. He and Victor G.J. Rodgers, assistant professor, were initiated as honorary members of Omega Chi Epsilon national chemical engineering honors society.

Dr. Victor G.J. Rodgers, assistant professor, received the 1991 Tau Beta Pi Excellence in Teaching Award. The award was presented during the College of Engineering spring honors banquet on April 18 (see story on page 9).

Student Activities

Dr. Kuruvilla John, a graduate student, spent the summer in Norway as a visiting scientist at the IBM-Bergen Scientific Center. John researched several environmental issues, including the effects of climate changes on air pollution in the eastern United States and the impact of the Kuwait oil fires.

Dr. Rao Kotamarthi, a graduate student, participated in the ACCESS program, which encourages doctoral and postdoctoral students researching atmospheric chemistry. During a three-day meeting at MIT in June, ACCESS participants presented seminars and met key senior researchers in the field. They participated the next week in the Gordon Conference in Atmospheric Chemistry.

Dr. Alan Langenfeld, a sophomore from Onawa, Iowa, has received a Carver Scholarship for achievement and determination in the face of significant obstacles.

Continued on next page

Researcher Charts Rainfall Dynamics To Predict and Warn of Flash Floods

Konstantine Georgakakos, associate professor of civil and environmental engineering and National Science Foundation Presidential Young Investigator, is working to save lives by developing accurate, efficient methods for predicting flash floods.

Georgakakos, who is also research engineer at the Iowa Institute of Hydraulic Research, uses an array of sophisticated computers, super-minicomputers, and software to study surface hydrology—what happens when rain falls and the timing, magnitude, and location of flooding. He links this information to hydrometeorological data on the genesis and dynamics of rainfall.

"The two fields of study are related," he says, "because to allow for adequate warning, we must be able to quickly predict the amount and location of rain as well as what will happen once it falls."

Part of Georgakakos’ lab is located on the roof of the University’s Hydraulics Laboratory, where every five seconds a weather station measures surface temperature, rainfall amounts, air pressure, humidity, and wind speed and direction. Georgakakos converts the basic knowledge he gains from data analysis to software programs he has developed to help predict rainfall. Both his software and his data analysis are used by the Corps of Engineers and the National Weather Service as an aid in weather forecasting.

Recently Georgakakos tested the system with data that was collected just before the devastating 1976 Big Thompson Canyon flood in Colorado. He was able to predict flow peaks to within 10 percent accuracy, and he says that if the system had been available before that disaster, researchers could have predicted the size of the flood and could have warned people an hour before the flood wave hit.

Georgakakos cautions, however, that no matter how accurate a warning system is, it will not be effective unless people...
heed it and resist the impulse to outrun a flash flood.

"People don't understand the speed of flood waves and how quickly a river can rise," he says.

As an undergraduate researcher at the National Technical University of Athens, Georgakakos focused on the interaction of waves with pile supports. After enrolling as a graduate student at MIT, he broadened his study to include open channel flow, flood prediction, the dynamics of local atmosphere, and rain prediction.

"As you can see," he says, "I'm moving toward the clouds."

Two years ago, Georgakakos also began researching the climatology of flooding, examining large-scale interactions between the atmosphere and the earth's surface. In addition to studying intense rainfall and flooding, he is designing procedures that will enable the National Weather Service to provide flash flood warnings on a small geographic scale—something it cannot do with current technology.

A team of researchers headed by Georgakakos and Witold Krajewski, assistant professor of civil and environmental engineering, has developed a warning procedure based on geographic information systems that describe drainage patterns and floodplains and can identify the regional conditions under which local flash floods are likely to occur. This Flash Flood Guidance Project, supported by a $130,000 grant from the Hydrologic Research Laboratory of the National Weather Service, is currently being tested in Oklahoma.

"The weather fascinates almost everyone," Georgakakos says. "There's an awful lot of water around us. If I can somehow improve public safety, I'll feel my work has been worthwhile."

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**Grant Aims to Strengthen America's Work Force**

The University of Iowa will help students and junior faculty—especially women and minorities—pursue teaching careers in engineering and the sciences with the help of a new grant from the GE Foundation of Fairfield, Conn.

Iowa was one of seven universities chosen to participate in GE's Faculty for the Future program, which is part of the foundation's focus on how changing demographics will shape America's future work force.

According to University of Iowa President Hunter Rawlings, the interdisciplinary grant will enable the University to strengthen its commitment to increase diversity, a major goal of its strategic plan. It also will help the University combat the increasing shortage of faculty in engineering and the sciences, a critical issue in higher education, Rawlings said, since the Ph.D. graduation rate in those disciplines is not adequate to meet the needs of industry and government or to fill faculty positions throughout the country.

Over a three-year period, the grant will help undergraduates engage in research projects and teaching internships, offer loans and financial assistance to graduate students, and promote the professional advancement of junior faculty members by supporting their research activities.

The GE Foundation started the Faculty of the Future program to help ensure America's future competitiveness and standard of living, according to Clifford V. Smith, the foundation's president.

"Changing demographics indicate greater numbers of women and minorities entering the work force," Smith said, "and the GE Foundation wants to help top universities, such as The University of Iowa, develop more faculty from these groups to prepare this important resource."

Other institutions that received Faculty of the Future grants were Cornell, Michigan State, Purdue, and Syracuse universities; MIT; and Texas A & M.
Young Engineers Mix Crop Residue, Landfill Bounty
For a Decidedly Different Approach to Warmth

Sixty high school students explored engineering as a creative venture, as a career, and as a means to solve a real environmental engineering problem this summer at the University's annual Summer Institute for Creative Engineering and Inventiveness. The young scientists spent three weeks in July examining whether fuel pellets made from crop residue and landfill paper could provide inexpensive and efficient fuel for low-income families.

The program was directed by Paul Scholz, associate dean of engineering, and Nicholas Colangelo, director of the Connie Belin National Center for Gifted Education in the University's College of Education. The students met with faculty members and professional engineers, conducted research, heard guest speakers, and received career counseling.

"An important goal of the program," Scholz says, "is to help young people understand the social and ethical issues as well as the technical and scientific complexities of social-technical problem solving."

Visits to the University’s poplar tree research project near Amana, to low-income family housing, and to the Iowa Department of Natural Resources gave students a firsthand look at environmental issues and the social and economic impact of engineering solutions.

Through a special mentor program, the institute continues to challenge students even after they have returned home. With the help of local professional engineers, institute participants will conduct individual projects to continue studying problems related to the environment and energy. They will return to Iowa City next May, accompanied by their mentors, to present their results.

Funded by the National Science Foundation and the Roy J. Carver Charitable Trust, the institute provides full scholarships, travel reimbursements, a $150 stipend, and scholarship awards for the best final papers. Acceptance into the program is highly competitive; Scholz says, with women and minority groups well-represented among the participants.
NASA Camp Sends High School Students On Quest for Space Science Theories

Surrounded by their families and College of Engineering faculty members, 18 exceptionally talented high school students recently “graduated” from the first Iowa Summer Space Science Program. At the July 19 closing ceremony, held in the elegant Old Capitol Senate Chamber, space camp students presented nine project proposals they had designed during two weeks of brainstorming in Iowa City.

The students tackled some of the central issues in space exploration, including the effects of microgravity on biological systems. For instance, Jason Edgington, from Indiana High School, and Anuj Goel, from Iowa City High School, designed a project to examine the effect of light wavelength on plant growth in microgravity. Their research on phototropism, gravitropism, and the effect of different kinds of light on plant growth led them to hypothesize that in microgravity, plants would grow more quickly in blue light than in sunlight.

“It was a great program,” Goel said. “The most valuable experience was learning how difficult it can be to envision your own research problem. I can’t think of a better way to have spent two weeks.”

The three-year program, directed by Norlin Boyd, assistant to the dean of engineering, and Audrey Butler, adjunct assistant professor of chemical and biochemical engineering, is part of a major effort launched by the National Aeronautics and Space Administration to interest and educate American children in the space sciences. Students in the program did laboratory and library research, took field trips, heard lectures, and tapped the expertise of faculty consultants, such as renowned space scientist James Van Allen.

Participants were selected on the basis of demonstrated ability and interest in science. Because women and minorities are underrepresented in science and engineering, the camp enrolled a significant proportion of qualified students in these groups.

A $20,000 NASA grant provided free room, board, materials, and field trips for the students.

About the “class of ’91” Butler said, “It was a great, hardworking group of kids. There’s no question that they all lived up to their abilities and talents.”

New Faculty Member Joins Electrical Engineering

The College of Engineering recently welcomed Theophano Mitsa as an assistant professor of electrical and computer engineering. Mitsa earned her undergraduate degree in electrical engineering at the University of Thessaloniki, Greece, in 1985, and her M.S. (1988) and Ph.D. (1991) degrees in electrical engineering from the University of Rochester.

Mitsa, a former Fulbright Fellow, has developed a novel halftoning method based on a blue noise mask that can be applied in digital equipment, such as fax machines and laser printers, or as a screen in optical processing for use in newspaper printing.

Electrical and Computer Engineering

Faculty Activities
- Susan Allen, professor, and Anjan Ghosh, assistant professor, have received a three-year grant from the Defense Advanced Research Projects Agency to study laser-manufactured materials and structures for advanced semiconductor packaging.
- Er-Wei Bai, assistant professor, has been awarded a National Science Foundation Research Initiation Grant to develop new identification techniques for control design in the presence of uncertainty.
- John Robinson, professor, is working with engineers from Collins Radio division of Rockwell International on high frequency radio channels for digital audio. The project is one of several collaborative efforts between University of Iowa faculty members and Rockwell-Collins that have been funded by Rockwell during the last two years.

Student Activities
- Raed Abu-Hijieh, a senior from the West Bank, has received the 1991 Philip G. Hubbard Human Rights Award. The award, announced in April at the 1991 Finkbine Dinner, recognizes outstanding contributions to the advancement of human rights, in keeping with the University’s commitment to human rights and equal opportunity.
- Adam Cain (B.S.E. in EE, ’91) received the 1991 Edwin B. Kurtz Merit Award as outstanding senior.
- Vivek Goyal, a senior from Cedar Falls, has received The University of Iowa Honors Program Scholarship For a Junior in the Natural Sciences.
- Kevin Le, a senior from Iowa City, and Brent Pease, a junior from Hinsdale, Illinois, received Iowa Space Grant College Consortium NASA Summer Undergraduate Research Experience Awards, which enabled them to work with University faculty members on NASA-related research. Pease also won a 1991-92 NASA Undergraduate Scholarship from the Iowa consortium.
- Stuart F. Oberman, a senior from Omaha, has received a University of Iowa Foundation Award for 1991. The award encourages outstanding students in their progress toward an honors degree.
- Brian Sarvis, a junior from Dubuque, was named a finalist for The University of Iowa Honors Program Scholarship. Sarvis is pursuing a double major in engineering and music.
Industrial Engineering

Faculty Activities

- Dennis L. Bricker, associate professor, and his graduate students are investigating problems in routing, scheduling, and facility location.
- James R. Buck, professor, conducted a survey last summer of human-factors/ergonomic design teaching in the United States. He reported the survey results and chaired a panel discussion at the Human Factors Society annual meeting in San Francisco.
- Andrew Kusiak, professor and chair, is preparing another book, an introductory text for John Wiley.
- Gary W. Fischer, associate professor, has offered a two-week lecture series last April on developing the Iowa Driving Simulator.
- Dennis L. Bricker, associate professor, conducted a survey last summer of human-factors/ergonomic design teaching in the United States. He reported the survey results and chaired a panel discussion at the Human Factors Society annual meeting in San Francisco.
- Edward J. Haug, professor of mechanical engineering, also presented a tutorial on a similar topic prior to the Conference on Artificial Intelligence in Engineering, held last June in London, England.
- John Littschwager, professor, was on developmental leave from January through July at the University of Grenoble, France, where he established a new program in industrial engineering.

Top Scholars Excel in Honors Program

According to Norlin Boyd, what’s good for the College of Engineering may be even better for the country. Boyd, assistant to the dean, is talking about the newly initiated College of Engineering Honors Program, which, he says, will not only benefit students but will help departments identify and encourage exceptional candidates for graduate school.

"With the shortage of graduate-trained engineers," Boyd says, "that could be a real plus for everyone."

Students who complete the program may participate in special academic, social, cultural, and fund-raising events. Honors students keep informed by reading the Honors Newsletter, and they use the library, computer, kitchen, and recreational facilities of the historic Shambaugh House Honors Center. With their bachelor of science degrees, they earn an honors designation on their permanent records.

Paul Scholz, associate dean, says the engineering honors program gives students the opportunity to go beyond regular course work and delve into their own research or practice teaching. Through the required one-semester Honors Seminar, students develop close ties to both fellow honors students and faculty members.

Qualified freshman and sophomore engineering students begin in the University Honors Program, and if they meet certain requirements, including a 3.2 grade-point average, they may apply for admission to the College of Engineering Honors Program as juniors and seniors.

"Engineering students are among the brightest and best-prepared students at the University," Boyd says. "The engineering honors program is designed to recognize those qualities."

May Grads Beat Expectations on Job Offers

Despite fewer government contracts in many industries and a nationwide economic slump, job prospects for May 1991 College of Engineering graduates were better than expected. While employers reported a 30 percent reduction in on-campus interviews nationwide, the number of University of Iowa bachelor of science students receiving job offers was down only 8 percent from May 1990.

Average starting salaries for Iowa bachelor’s degree graduates kept pace with national averages in most majors and exceeded national averages in civil and mechanical engineering. Engineering students graduating from Iowa with master’s degrees averaged higher salaries in chemical, environmental, electrical, industrial, and mechanical engineering.

In addition to companies interviewing on campus, another 59 firms received résumés from the Engineering Placement Office and had made 17 job offers by late June. Fourteen companies offering summer employment conducted 115 interviews through the placement office.

Employment prospects for recent engineering graduates may be on the upswing. A Manpower, Inc., poll reported by the College Placement Council indicates that 22 percent of polled employers intend to increase their work force in late 1991 and 1992, while only 10 percent plan to scale down their number of employees.

Richard Simon, professor, participated in a panel discussion on stimulus response compatibility at the Annual Human Factors Society Annual Meeting in Orlando, Florida. Simon holds a joint appointment in psychology.

Edward Szczerbicki, visiting assistant professor, is conducting research on engineering design, concurrent engineering, and autonomous systems design. Szczerbicki has published several papers on conceptual design and on information systems design and evaluation.


Student Activities

Karen L. Baker, a senior from Rochester, Minnesota, has won The University of Iowa Penningroth Award, presented annually to a junior for all-around achievement. She also has received the Lloyd A. Knowler Scholarship and the National Computer Systems Scholarship, both awarded by the College of Engineering.

Amanda M. Curran, a senior from Jefferson City, Missouri, has received a University of Iowa Foundation Award for 1991. The award encourages outstanding students in their progress toward an honors degree.

Todd Smith, a junior from Muscatine, Iowa, received an Iowa Space Grant College Consortium NASA Summer Undergraduate Research Experience Award, which enabled him to work with a University faculty member on NASA-related research.

**Professor Mixes Challenge, Empathy To Earn Reputation as the 'Very Best'**

"He was easily the best teacher I've had since third grade," says one engineering student about Victor Rodgers, assistant professor of chemical and biochemical engineering.

Adds another student, "Professor Rodgers challenged me to learn more than was required—he is the very best instructor I've had at the University."

To recognize Rodgers' superb teaching abilities, The University of Iowa chapter of Tau Beta Pi presented him with the 1991 Excellence in Engineering Teaching Award.

Rodgers combines tough challenges with empathy to motivate his students. "I always want my students to be good; they'll tell you I'm one of the toughest teachers in the department," Rodgers says. "But I also remember what it's like to be in the classroom taking notes, so I try to relate complex equations to real life and put difficult concepts into plain English. I emphasize that math is just a way to express what we see and feel."

Rodgers' childhood inspired both his passion for engineering and his concern for teaching excellence. Growing up in St. Louis, he and his identical twin brother, Vincent, spent hours in their basement poring over science encyclopedias. When Rodgers was older, his teachers at St. Blaise School, particularly sixth-grade teacher Richard Lee, provided role models.

"Mr. Lee was dynamic, aggressive, and challenging, but he also was fun," Rodgers says. "Vincent and I were always trying to prove him wrong, and when we did, he always admitted it."

Rodgers earned his master's degree in chemical engineering from the University of Pittsburgh and his doctorate from Washington University then worked for three years as an engineer for Gulf Research & Development Company. He has been teaching at the College of Engineering since 1989.

While pursuing his own research, which focuses on transmembrane pressure pulsing and protein separation, Rodgers encourages students to be creative in the laboratory, "to find their own way of doing things." And despite the accolades he has won as a teacher, he says his ultimate goal is to learn.

"The more I learn," he says, "the more effective I can be in the classroom, the lab, and in recruiting women and minorities to pursue engineering careers."

Rodgers' brother Vincent is now an assistant professor of physics and astronomy in the College of Liberal Arts.
Mechanical Engineering

Connie Lang, secretary, was awarded one of five Staff Excellence Awards presented in September at the University Convocation.

Lea-Der Chen has been promoted to the rank of full professor. Chen also has won a grant from the Office of Naval Research to continue his study of liquid-metal wick combustion.

Faculty Activities

Christopher Beckermann, assistant professor, presented invited seminars on modeling of solidification processes at the University of Wisconsin at Madison, the University of Iowa, and the University of Washington, Seattle, and the NASA Lewis Research Center, in Cleveland.

Ching-Jen Chen, professor and chair, is organizing the first Iowa Space Conference, to be held January 24-25 at The University of Iowa. Awards recipients and fellow advisor scholarship holders from the Iowa Space Grant College Consortium will attend. Chen is the University coordinator and executive member of the consortium.

Chen supervised four groups of mechanical engineering students who presented projects last April in Waterloo, Iowa, at the 24th Annual Dave Stover Memorial Student Papers Competition, sponsored by the Society of Automotive Engineers. Two other student teams enrolled in the design course won two of three runner-up awards.

Chen has been invited to be an academic leadership fellow of the Committee on Institutional Cooperation for 1991-92. The program develops leadership and managerial skills of faculty members.

Ralph I. Stephens, professor, received the ASTM 25-Year Continuing Service Appreciation Award last spring. In November and December he will teach a short course on fatigue design and research at Gadjah Mada University, in Yogyakarta, Indonesia, and will consult with materials testing laboratories there.

Student Activities

Karen L. Baker, a senior from Rochester, Minnesota, Kent Carlson (B.S.E. in ME, '91), Jeffrey Ehliert (B.S.E. in ME, '91, now a graduate student), Terry Irwin, a senior from Grinnell, and Buss Price, a senior from Burlington, received Iowa Space Grant College Consortium NASA Summer Undergraduate Research Experience Awards, which enabled them to work with University faculty members on NASA-related research.

Kent D. Carlson (B.S.E. in ME, '91), Jeffrey L. Haferman (B.S.E. in ME, '89), Robert G. Schmidt (B.S.E. in ME, '89), and Ray C. Damaso (B.S.E. in ME, '90) have received 1991-92 NASA Space Grant Graduate Fellowships from the Iowa Space Grant College Consortium.

Engineers Solve Technical Problems By Designing with a Personal Touch

When Tim Shriver and Joseph Lieskovsky took their senior engineering design course, they did more than just design and build a machine—they also made life better for another University of Iowa student.

Shriver and Lieskovsky designed improvements for Brian White's electric wheelchair that enhanced White's comfort and convenience. The redesigned chair recently took top honors at the 24th Annual Dave Stover Memorial Student Papers Competition, sponsored by the Mississippi Valley Section of the Society of Automotive Engineers. Two other student teams enrolled in the design course won two of three runner-up awards.

Shriver and Lieskovsky, who operated under the mock company name of "T&J Engineers," first talked with White to discover how they could help lessen some of the frustration he experienced with his original chair design.

Then they got to work designing and building their improvements. By relocating the chair's microcomputer control beneath the seat, they eliminated a chair safety hazard and provided protection for the control. They built a right armrest that contains the joystick chair control and provides storage for books, food, and drinks, which White had been carrying in his lap. They also added a collapsible left armrest, enabling White to move in and out of the chair more easily.

T&J's approach is just the kind of problem solving that course instructor C.J. Chen wants to inspire.

"Both creativity and technical skills are applied by students in this course," Chen says, "just as in any good engineering project. But it's also important for students to remember that good engineers not only deal with machines, but with people."

Chen, who is professor and chair of mechanical engineering, also emphasizes communication skills in his course, teaching his students how to write design proposals and progress reports. His students must present—and sometimes defend—their proposed designs before their peers and then again before a panel of academic and corporate engineers.

Chen says, "The first day of class I tell them, 'Now you are professional engineers, minus six months. When you come to me with your design ideas, think of me as your boss. Sell me on your project.' "

Chen also insists that students actually build the machines they design.

"It's a lot of work in 13 weeks, but they really enjoy that part of the course," he says. "Taking their ideas from paper to the end product makes everything more vivid, more exciting for them."

Ideas developed this year included a flow visualization system using helium-filled soap bubbles, an alternative to helicopter rotor assemblies, and a pneumatic air tool that reduces the force required for a specific assembly line job.

According to Chen, the objective of the course is more than for students to synthesize what they've learned during their undergraduate study of engineering.

"I want them to see the excitement of engineering too," Chen says. "It's really a course about plain old Yankee ingenuity."
Angela DePalma, a senior from Chicago, Pat Finn (B.S.E. in ME, '91), and Mark Testin, a senior from Glen Ellyn, Illinois, worked with other students to design and fabricate a car for the Midwest Mini-Baja Competition, held in May at Dayton, Ohio. Although the car performed well in the braking and maneuverability events, it fared less well in the endurance portion of the contest. The team is looking forward to the next competition.

Josh Jaeger, a junior from Iowa City, received a one-semester undergraduate fellowship from the U.S. Department of Energy, Office of Energy Research. Last spring Jaeger conducted research at the Los Alamos National Laboratory under the Science and Engineering Research Semester (SERS) Program.

Timothy Shriver and Joseph Lieskovsky (both B.S. in ME, '91) received the best paper award in the 24th Annual Dave Stover Memorial Student Papers Competition. Organized by the Mississippi Section of SAE, the competition is open to engineering students at Iowa State University, the University of Wisconsin—Platteville, and The University of Iowa. The winning paper's title was "Improvement of wheelchair design for Iowa City resident (Brian White)" (see story on page 10).

Brian S. Zilman, a sophomore from Mount Pleasant, Iowa, has received the outstanding sophomore award from the UI chapter of Pi Tau Sigma, the mechanical engineering honor society.

Alumni Awards

Rebecca L. Anderson (B.S.E. in EE, '90) has received a 1991 National Science Foundation Graduate Fellowship award.

William M. Sangster (B.S.C.E., '47, M.S., '48, Ph.D., '54) received the 1991 Linton E. Grinner Distinguished Service Award from the Accreditation Board for Engineering and Technology. The award is given annually to an individual who has made outstanding contributions to engineering, engineering technology, and engineering-related education through work with ABET. Sangster, who served as dean of engineering at Georgia Institute of Technology for 17 years, is now the director of international programs for Georgia Tech.

Faculty Honors and Awards

Clyde M. Berry, professor emeritus of civil and environmental engineering, has received the 1991 Borden Award from the American Industrial Hygiene Association. The award recognizes distinguished service in the advancement of industrial hygiene and unique technical contributions to the aims and goals of the AIHA. It also encourages continuing studies and research in the science of industrial engineering.

James R. Buck, professor of industrial engineering, was named a fellow of the Institute of Industrial Engineers at the institute's annual meeting, held in May in Detroit, Michigan.

P. Barry Butler, associate professor of mechanical engineering, has received the 1991 Ralph R. Teeter Educational Award. The award recognizes the nation's top engineering educators who promote the ideals of SAE International, the engineering society for advancing mobility on land, sea, air, and space.

Gregory R. Carmichael, professor and chair of chemical and biochemical engineering, has been named to the executive science team for the NASA Pacific Exploratory Mission, which will study atmospheric chemistry in Asia.

Allen T. Chwang, professor of mechanical engineering, has been elected a fellow of the American Society of Civil Engineers.

Philip G. Hubbard, professor emeritus, was awarded a special Hancher-Finkbine Medallion during the Finkbine Dinner on April 30. Hubbard, who was vice president for student services and director of Opportunity at Iowa when he retired last December, was recognized for his outstanding scholarship in hydraulic engineering, his exemplary leadership in the Office of Student Services, and his career of unselfish service to the University community.


Jerald Schuur, professor of civil and environmental engineering, received the Best Paper Award at the Conference on Hazardous Waste Research, sponsored in May by Regions 7 and 8 of the Environmental Protection Agency's Hazardous Substances Research Center. Schuur's paper, "Modeling of Alachlor and Alarize at a small plot in Amana, Iowa," was co-authored by graduate student Diliopan Nair.

The National Academy of Sciences recently named Schuur an exchange scholar to Czechoslavakia. Schuur also has been appointed associate editor of Environmental Science and Technology.

Han-Chin Wu, professor of civil and environmental engineering, has been elected a fellow of the American Society of Mechanical Engineers.

Student Awards

Bryce A. Amhof, a senior in civil and environmental engineering from Davenport, has received an NSF Research Experiences for Undergraduates award. The award enables talented undergraduate students to participate in NSF-sponsored research. Amhof will work with Professor Stoner and Kuhl on the Iowa Driving Simulator.

Shym Asolekar, a graduate student in civil and environmental engineering, has received the Outstanding Student Award from the American Chemical Society. Only 15 such awards are made nationally.

Karen L. Baker, a senior in industrial engineering from Rochester, Minnesota, has received the Lillian Moller Gilbreth Scholarship, awarded by the Society of Women Engineers to an outstanding junior or senior woman in industrial engineering, and the Dwight D. Gardner Scholarship, from the Institute of Industrial Engineers.

Thomas Cross (B.S.E. in EE, '91), Kelly Poort (B.S.E in BME/EE, '91), Robert Ridenour (B.S.E. in EE, '91), and Russ J. Vander Wiel (B.S.E. in EE, '91) received honorable mentions in the 1991-92 National Science Foundation Graduate Fellowship competition.

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Jason Fabritz, a junior in civil and environmental engineering from Solon, Iowa, has received a scholarship for 1991-92 from the Consulting Engineers Council of Iowa. Fabritz also received a U.S. Department of Energy Summer Internship to work at the Sandia National Laboratory in New Mexico last summer.

Vivek Goyal, a senior in electrical and computer engineering and in mathematics from Cedar Falls, and Amy L. Miller, a sophomore in biomedical engineering from Topeka, Kansas, have received Barry M. Goldwater Scholarships. The scholarships are awarded to 250 sophomores across the country who plan to pursue careers in mathematics or the natural sciences.

Making Eye Contact  Doug VanDaele, a senior in biomedical engineering from Fairbank, Iowa, works with a computerized eye monitor developed by Glenn Myers, assistant professor of biomedical engineering. Myers, who is working on the project in conjunction with researchers in ophthalmology, uses the scanning device to produce a digitized model of pupil movement, seen on the screen at the center of the photo. Possible commercial applications of the monitor include controlling a computer with eye movement rather than with the conventional hand-held mouse.