IOWA STATE UNIVERSITY
College of Engineering

DIMENSIONS

Department of Mechanical Engineering

Volume No. 18 | Issue No. 1

IN THIS ISSUE

Message from the Chair

This semester proved to be one of transition for the department's administrative offices. We are proud that our former department chair, **Jonathan Wickert**, was appointed dean of the College of Engineering at Iowa State, and I am privileged to be serving as interim chair. Additionally, our staff members now have adequate office space, having been temporarily relocated as we remodeled several areas of the second floor in the building.

We take great pride in the accomplishments of our students, faculty, staff, and alumni, some of which are highlighted in the following pages, as they each show the continued strength and excellence of our department.

Our students have again demonstrated they are learning lessons about leadership and social responsibility from their experiences and involvement with class projects, student organizations, and study abroad.

During the spring 2008 semester, students in the ME design course created a new wheelchair-accessible car for Riley's Camp Courageous Train. The car was recently put on the tracks, allowing all campers to enjoy a train ride around the camp.

The College of Engineering named **Jared Ramthun** to be the student marshal for the undergraduate commencement ceremony. Ramthun, who concurrently earned his bachelor's in mechanical engineering and a master's in business administration, was also selected as the keynote speaker for the College of Business commencement ceremony.

One of our graduating seniors, **Clay Hopes**, studied and researched abroad, while also initiating a program to help international exchange students join the Greek community at Iowa State.

We have the honor of being connected to two winners of prestigious NSF graduate fellowships. **Joseph Miller**, a current PhD, and **Raathai Molian**, an ME alumna, will receive support from the awards as they continue their education and research.

And the performance of our graduate students continues to be recognized, with several earning teaching and research excellence awards this year. While this is just a sample of the great things our students are doing, they demonstrate the passion that underlies the future of mechanical engineering.

Beyond our students, the department has been building lasting relationships with top engineering schools and diversifying our student population.

Sriram Sundararajan and **Amy Carver** visited Monterrey Tec in Mexico, developing a strong enthusiasm toward enhancing existing exchange programs to foster interest in research and graduate studies.

We received a Women's Enrichment grant through the collaboration of **LeAnn Faidley**, **Shankar Subramaniam**, **Bethany Juhnke**, and **Janelle Miranda**. The team was awarded $5,000 in seed funding for its "NEST: A Nurturing Environment for Women in Science and Technology Research" project, which will help introduce undergraduates, especially female students, to research opportunities in the department.

As a result of these and other important efforts, the number of graduate student applicants and female undergraduates has increased this past year, expanding the department's pool of talented students.

Finally, as we continue our effort to capture the history of the department through stories and pictures we find on campus, I ask you to please consider sharing your experiences with us! Send a note to mealumni@iastate.edu.

Theodore (Ted) J. Heindel

On the cover

An ME student works on design projects, applying classroom lessons to engineer a prototype that meets specific criteria and design requirements.

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Henry M. Black (1907–1989)

Henry M. Black, class of 1929, was head of the mechanical engineering department from 1946 to 1972. Through his efforts and ability to attract outstanding academicians and students to Iowa State University, the department gained national and international recognition.

Iowa State University Library/Special Collections Department

A registered professional engineer, Black was a fellow and past vice president of the American Society of Mechanical Engineers, a member of the American Society for Engineering Education, a member and past president of the Iowa Engineering Society, and a member of the Iowa State Board of Engineering Examiners and Tau Beta Pi.

Black retired from the U.S. Army Corps of Engineers in 1963 after 30 years of continuous service. In World War II, he served his country as a colonel in the 7th Army Corps. He graduated from the Army-Navy Staff College in 1945. Among his many military honors are the European, African, and Middle East Theatre Campaign Medal with five battle stars and combat landing arrowhead, the Legion of Merit Medal, and the French Croix de Guerre.

In the community, Black was active in Rotary, the Boy Scouts of America, the Ames Chamber of Commerce, the Ames Economic Development Commission, and the Y.M.C.A. He was a member of the United Church of Christ, where he served as moderator, deacon, and trustee.

At Iowa State, he served on the Academic Standards Committee, the Technical Institutes Committee, and the College of Engineering's Committee on Honors and Awards. He founded the Senior Advisor Group of Engineers that consisted of retired faculty from the College of Engineering.

Black served for many years as chapter adviser to his fraternity, Delta Sigma Phi. He was instrumental in raising more than $450,000 for the Black-Hilstrom Fund and worked with the Iowa legislature to lay groundwork that made possible the $14 million building that now bears his name.

Wickert named College of Engineering dean

Jonathan Wickert, chair of the Department of Mechanical Engineering at Iowa State and Larry and Pam Pithan Professor of Mechanical Engineering, has been appointed dean of the College of Engineering effective July 1.

He succeeds Dean **Mark J. Kushner**, who joined the University of Michigan faculty in September 2008. **James Bernard**, Anson Marston Distinguished Professor of Engineering and professor of mechanical engineering, has served as interim dean.

In his new role as dean, Wickert will combine the strong legacy of the college with the talents of faculty, researchers, and students to address the current and future needs of society.

Contribute to the department's history book!

In the past two issues of *Dimensions*, we have started discussing some of the department's historical figures. We are collecting information for a Department of Mechanical Engineering history book, and we would like you to provide some input. Maybe you have a fond memory of Henry Black, or you know another important figure of the department. Or maybe you were around when there was a major shift in the department's curriculum. Your stories will help share the department's rich history for years to come.

Please send any ideas, thoughts, memories, or photos that we could use as we continue to document the history of the ME department to mealumni@iastate.edu or 2025 Black Engineering, Iowa State University, Ames, IA 50011-2161. Remember to include your contact information.

ME students learn and make a difference through student organizations

From a new organization on campus to one that has been around for more than 100 years, the impact of student organizations extends from enriching students' lives to improving the lives of those in impoverished nations.

At the College of Engineering, there are more than 50 engineering-related organizations students can be a part of, not including the hundreds of other groups formed around different common interests across campus. These organizations offer students service projects, recognize accomplishments, and provide an opportunity to practice leadership and engineering principles.

Engineers Without Borders

In September 2008, the student chapter of Engineers Without Borders (EWB) was founded on Iowa State's campus with a mission to provide students with an opportunity to confront global poverty. The organization works with villages in developing countries to implement engineering projects that improve quality of life. Their projects introduce technologies that meet basic human needs and are culturally appropriate and economically sustainable.

President and founder of the chapter **Nathan Johnson**, BSME'04, MSME'05, and current doctoral candidate studying mechanical engineering and international development, says establishing EWB at Iowa State helps give students an opportunity and direction for putting their goodwill to work.

"Students are interested in addressing humanitarian issues," Johnson says. "With EWB, they find common vision and a pathway for developing skills to meet needs of the next generation across the globe."

The organization is open to all disciplines in an effort to bring as much insight to the projects as possible. As EWB continues to develop as a student organization, leaders are planning awareness events to help build global knowledge about worldly issues.

"Once you start thinking about poverty, sustainability, and how you can help, your worldview changes," Johnson says. "It's energizing to see how students grow throughout their involvement in the organization." Members are currently working on implementing projects in Belize and Mali, Africa, in summer 2009 and are hoping to meet requests for projects in Haiti, Rwanda, and Tanzania as new members join. Find out more information at www.ewb.stuorg.iastate.edu.

Tau Beta Pi

As an engineering honor society, the Iowa Alpha Chapter of Tau Beta Pi helps students build a network with their peers within the College of Engineering. To be eligible, students must be within the top percentile of their class and at least at the junior level of their academic career. The organization prides itself on initiating students with strong character and integrity, and it offers students the opportunity to participate in outreach and volunteer activities.

The chapter has gained national recognition for its service projects, including hosting an annual roller coaster competition for middle and high school students. Marc Hermon, an Urbandale High School teacher, started the competition to engage students interested in mathematics, physics, and engineering, and the Iowa Alpha Chapter took over coordinating it shortly thereafter.

"The Roller Coaster Competition is a fun and inviting way for younger students to practice engineering," says **Ryan Schwartz**, a recent ME graduate who was the project officer for outreach activities, "It has inspired several students to pursue engineering, making it a worthwhile project for our organization."

Tau Beta Pi, the national engineering honor society, was founded at Lehigh University in 1885 by Dr. Edward Higginson Williams Jr. to honor exemplary character as undergraduates in engineering and high achievement in the field of engineering. The Iowa Alpha Chapter of Tau Beta Pi was founded on December 20, 1907, and has since initiated more than 6,000 members.

The chapter also participates in Adopt-a-Highway, coordinates Building the Future, holds an annual Catapult Competition, and sponsors the Pi Mile Run. Find out more at http://iowaalpha.tbp.org. **LeAnn Faidley**, assistant professor of mechanical engineering, is the lead adviser for the Iowa State chapter of Tau Beta Pi.

A team of middle school students prepares their roller coaster at the annual Tau Beta Pi Roller Coaster Competition.

ME graduate makes college a journey

The summer before heading to Iowa State for college, **Clay Hopes** was working for the U.S. Army Corps of Engineers. His manager offered him a piece of advice that Hopes took to heart—take advantage of all the opportunities you are offered while you are there.

During his five years of school, Hopes has traveled to more than twenty countries; completed three study abroad trips in Australia, Germany, and Scotland; and assisted with research during a summer in Germany.

While he was abroad, Clay Hopes visited the Plaza de España in Spain.

Hopes, who graduated this May, earned a bachelor of science in mechanical engineering and a minor in entrepreneurial studies. "Once I traveled to Australia, I was hooked," Hopes says. "I loved everything about being abroad—the people, the culture, the friendships—it gave me a whole new perspective on how much there is to learn, see, and appreciate."

He was especially impressed with the living accommodations during his trip to Australia, which allowed international students to live and mingle with native Australians. These arrangements helped Hopes acclimate to different cultures, as well as make lasting friendships with fellow students across the globe.

The setup inspired him to start a new program at Iowa State. Hopes wanted to provide international exchange students with the opportunity to live in the Greek community and experience firsthand the American culture and ways of life. "When exchange students come into a place foreign to them, they should immediately feel welcomed," Hopes says. "The program helps them get to know others quickly, and it provides the Greek community with more diversity and new ideas."

Sharing the value of studying abroad, Hopes was a global ambassador in the Iowa State Study Abroad Center. He was also a project leader for Engineers Without Borders, worked on Iowa State's Solar Decathlon, and acted as outreach chair for the Society of International Engineers.

During his senior year, Hopes completed an independent study in renewable energy—the same area he plans to focus on during graduate school in Europe. "The future will bring many changes, especially in the energy industry," he says. "I will be studying to bring new perspectives and positive changes to create a better world."

Women in Mechanical Engineering program provides students with valuable resources

From social gatherings to industry panelist presentations to professional mentors, the Women in Mechanical Engineering program is helping students develop a network of peers, faculty, staff, and professionals. These relationships are integral to the program's mission, which is to bring women together to share the experiences and rewards of being a mechanical engineer.

Courtney Hazlett, a freshman ME student from Dallas, Texas, is actively involved in the program as a student leader and says the Women in Mechanical Engineering program was a great way for her to get to know others and find study groups.

"Meeting people who can relate to my experiences is important," Hazlett says. "This has been especially helpful as I'm sorting out my future plans and making the most out of college."

Hazlett participates in the mentorship component of the program, which uses Facebook to connect students with professionals. "My mentor helped me prepare for the career fair and gives me insight into what professional life is like."

The Women in Mechanical Engineering program is coordinated by **Janelle Miranda**, who is the undergraduate program assistant for the ME department, and Shankar Subramaniam, associate professor and faculty adviser for the program. "Traditionally, female engineers are more likely to be drawn to chemical, environmental, and biomedical majors," Miranda says. "Through our events, we want to show women just how many opportunities a degree in mechanical engineering can offer."

In addition to several social events, the Women in Mechanical Engineering program has hosted a panel discussion that explored the life paths of five female engineers, with each panelist discussing how to achieve balance in her personal and professional life, as well as an undergraduate research information session to provide students with more information on how to get involved in research early on in their academic career.

Janelle Miranda and Courtney Hazlett discuss outreach opportunities for the Women in Mechanical Engineering program.

Additionally, Miranda has been contacting prospective students, working with alumni mentors, implementing activity for an American Society of Mechanical Engineers Diversity Action Grant the program received, and collaborating with faculty to facilitate undergraduate research activities as part of the Women's Enrichment Grant received from the Office of the Executive Vice President and Provost. All of these efforts provide a uniquely welcoming environment for growing numbers of women and students from diverse backgrounds.

ME grad students launch bioenergy business

Brought together by a common research interest in biofuels, **Jared Brown**, **Cody Ellens**, and **Anthony Pollard** are three ME graduate students who will be sticking around Ames after graduation in August.

The students have formed Avello Bioenergy, Inc., an emerging company that is planning to introduce every county in Iowa to a technology that turns nonfood biomass resources such as corn stover into liquid bio-oil. In August, they will be moving their business to the Iowa State University Research Park.

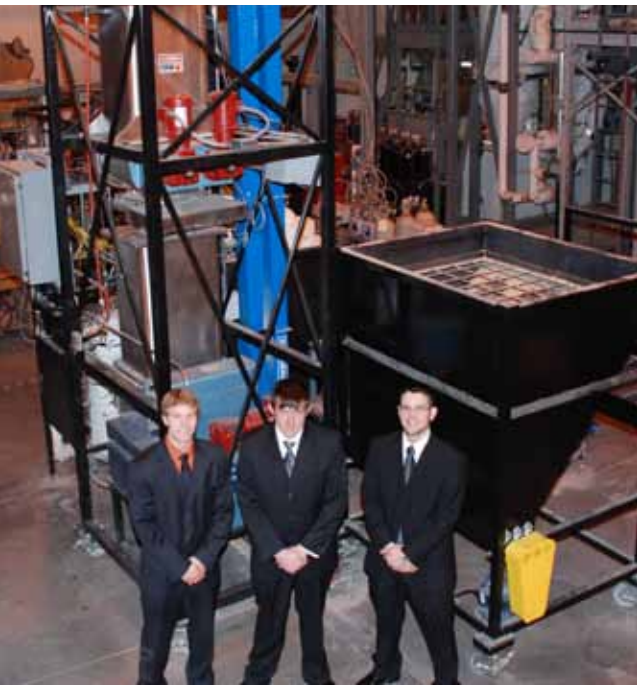


Photo by Lysle Whitmer

Cody Ellens, Anthony Pollard, and Jared Brown make up Avello Bioenergy, a company developed to commercialize fractionated bio-oil in a distributed bioenergy system.

Working under **Robert Brown**, Gary and Donna Hoover Chair in Mechanical Engineering and Anson Marston Distinguished Professor of Engineering, the students are also majoring in biorenewable resources and technology. "We all have a passion to work with cutting-edge technology that can help make a positive impact," says Jared Brown. "The challenge we faced was finding a job working with biorenewable energy in the United States—that's when we started thinking about forming our own company."

Avello Bioenergy will consult with locations across the state to design and build facilities that process biomass through fast pyrolysis equipment and distribute the resulting bio-oil to power plants, materials companies, refineries, and chemical companies. The technology to be used in the facilities is proprietary technology developed at the Center for Sustainable Environmental Technologies that will be licensed from the Iowa State University Research Foundation.

Because the end result of the processing is liquid, the product can be more efficiently transported. Additionally, biochar, a value added by-product, results from the process and can increase soil properties to make it more fertile.

Bio-oil has several applications, including electricity, asphalt, synthetic fuels, and renewable chemicals. Companies have already expressed interest in the product and are in need of large quantities of the product to test it and figure out the best way to integrate it into their line of business.

The team of students has received encouragement and support in terms of business development from Robert Brown and Iowa State. They were winners in the Pappajohn New Venture Business Plan and also competed in the 2009 Rice Business Plan Competition. Now they are focused on obtaining federal grant support to continue their research and business plan, with hopes of relocating to the BioCentury Research Farm, a facility being constructed to integrate the production and processing of biomass.

Graduate student honors and awards

Denis Dorozhkin
Fall 2008 Teaching Excellence Award

Pravan Kumar Karra
Spring 2009 Research Excellence Award

Som Shrestha
Spring 2009 Teaching Excellence Award

Kanaga Subramanian
Fall 2008 Research Excellence Award

Yan Yan
Spring 2009 Research Excellence Award

Four graduate students were recognized for their research in the Department of Mechanical Engineering's design and manufacturing innovation research program, earning Excellence of Graduate Research in Design and Manufacturing awards.

Kyung Ho Kang
1st Place ($500) … "Novel Differential Surface Stress Sensor for Detection of Biological Molecules: DNA Hybridization and Cocaine Detection"

Reuben Flesner
2nd Place ($300) … "An Integrated Macro/Micro Model for Solid Oxide Fuel Cell"

Sobieslaw Gacek
3rd Place ($100) … "Development of High-Efficiency and Cost-Effective Micro Wind Turbines"

Yufeng Wu
3rd Place ($100) … "Experimental Study on Viscosity and Phase Segregation of Al-Si Powders during Micro-Semisolid Powder Forming"

ME department turns out two winners of prestigious NSF graduate fellowships

Miller

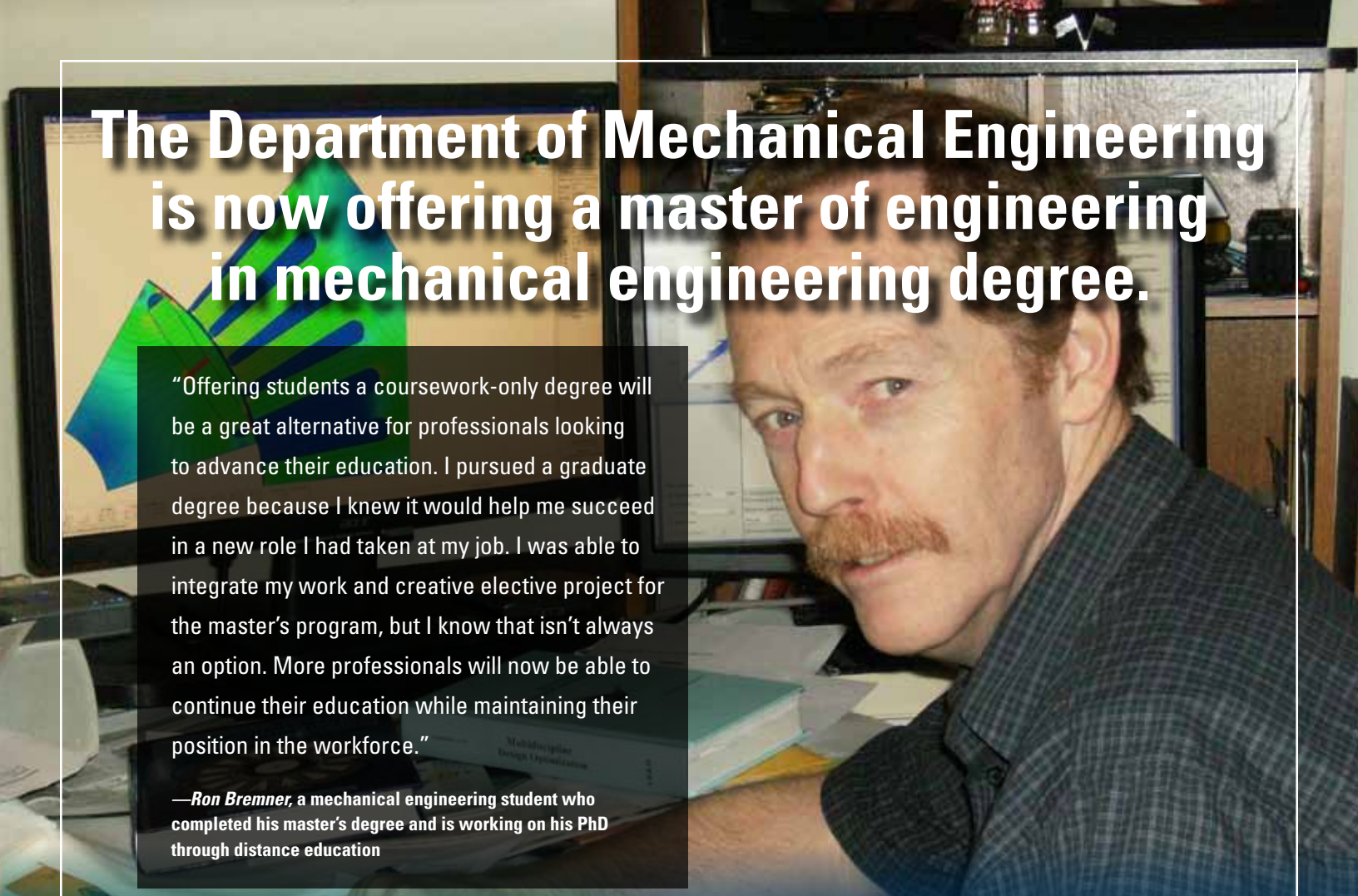
Two of this year's National Science Foundation (NSF) graduate fellowship winners have ties to the ME department at Iowa State. Among the winners were **Joseph Miller**, who is a PhD student studying under Assistant Professor **Terrence Meyer**, and **Raathai Molian**, who earned her bachelor's degree from the ME department in 2008.

Molian

The National Science Foundation Graduate Research Fellowship Program funds three years of study—up to $121,500—in master's or doctoral degrees focusing on research in science, technology, engineering, and mathematics. The NSF awarded 950 graduate fellowships this year.

"Joe and Raathai should be extremely proud of their accomplishments," says **Ted Heindel,** interim department chair of mechanical engineering and Art and Priscilla Bergles Professor of Thermal Science. "This prestigious award provides them each with many opportunities and options as they pursue their graduate studies."

Miller joins four other NSF fellows enrolled at Iowa State. Three of them—**Catie Brewer**, chemical and biological engineering; **Sasha Kemmet**, electrical engineering; and **Mike Steffen**, computer engineering—each received fellowships last year, and **Cory Kleinheksel**, electrical and computer engineering, was awarded a fellowship this year.



The Department of Mechanical Engineering is now offering a master of engineering in mechanical engineering degree.

"Offering students a coursework-only degree will be a great alternative for professionals looking to advance their education. I pursued a graduate degree because I knew it would help me succeed in a new role I had taken at my job. I was able to integrate my work and creative elective project for the master's program, but I know that isn't always an option. More professionals will now be able to continue their education while maintaining their position in the workforce."

***—Ron Bremner,* a mechanical engineering student who completed his master's degree and is working on his PhD through distance education**

For professionals seeking additional education beyond a bachelor's degree to become an outstanding engineer, the Department of Mechanical Engineering is now offering a master of engineering in mechanical engineering (MEng ME) degree. Providing a unique blend of technical and managerial education, the program will help you compete in today's ever-changing work environment.

This coursework-only program is delivered completely online. You, along with our department's faculty advisers, design a schedule that fits your needs.

Benefit from Iowa State's tradition in engineering excellence. The master of mechanical engineering degree requires 30 credits of coursework taught by the same world-renowned faculty who teach our resident courses.

It's flexible. You can choose from our range of research focus areas to customize your educational experience to your individual needs. Up to 15 credits can be taken outside of ME to broaden your breadth of knowledge. The MEng ME program will extend your ability to succeed in your chosen field and work across disciplinary boundaries.

The professional independence, creativity, and leadership you will experience in our program will provide you with a rewarding education highly sought after by industry.

Now accepting applications!

Fall 2010 admission . . . . . apply by January 10, 2010

Learn more!

- For details about the coursework-only MEng ME, contact Amy Carver at megradinfo@iastate.edu or 515 294-0838.
- For general information about mechanical engineering, visit www.me.iastate.edu.
- For graduate programs, visit www.me.iastate.edu/academics/graduate-program.
- Engineering Distance Education, visit www.ede.iastate.edu.

IOWA STATE UNIVERSITY
Department of Mechanical Engineering

Iowa Power Fund advances Iowa State development of clean energy technologies

Iowa State University researchers are working to produce clean, renewable energy by developing a new, low-emissions burner and a new catalyst for ethanol production. Both technologies will use the synthesis gas—a mixture of carbon monoxide and hydrogen—produced by the gasification of discarded seed corn, switchgrass, wood chips, and other biomass. The burner will be designed to efficiently and cleanly burn biomass-based gas, and the catalyst will be designed to convert the synthesis gas directly into ethanol.

Photo by Bob Elbert

Song-Charng Kong is leading a research project that aims to develop new, clean, and renewable energy technologies that complement the ethanol industry.

The project is supported by a two-year, $2.37 million grant from the Iowa Power Fund, a state program to advance energy innovation and independence.

Song-Charng Kong, an Iowa State assistant professor of mechanical engineering, is leading the project. The research team also includes **Robert C. Brown**, Iowa Farm Bureau director of Iowa State's Bioeconomy Institute, Anson Marston Distinguished Professor of Engineering, and Gary and Donna Hoover Chair in Mechanical Engineering; **Victor Lin**, professor of chemistry, director of Iowa State's Center for Catalysis, director of chemical and biological sciences for the U.S. Department of Energy's Ames Laboratory, and founder of Catilin Inc., an Ames-based company that produces catalysts for biodiesel production; **Samuel Jones**, assistant scientist for the Center for Sustainable Environmental Technologies; plus seven graduate students and two postdoctoral researchers.

The project also includes two industrial partners: Frontline BioEnergy, an Ames-based company that builds commercial-scale gasification systems; and Hawkeye Energy Holdings, an Ames-based ethanol producer with plants in Iowa Falls, Fairbank, Menlo, and Shell Rock.

Moving ethanol production beyond the fermentation of simple sugars in corn kernels, the researchers' idea is to use heat and oxygen to gasify biomass and produce a medium Btu gas (called synthesis gas) that a new catalyst can convert directly into ethanol. They'll also generate the gas using air to make a low Btu gas (called producer gas) that can be used in gas-fired heating and drying equipment.

The project has potential to do a lot more than develop new technologies and patents. According to the researchers, using biomass to produce ethanol and provide heat for ethanol production can reduce the nation's dependence on foreign oil, reduce the carbon footprint of ethanol plants, increase the plants' renewable energy ratio, boost the profitability of biorefineries, and put energy dollars into local economies.

John Reardon, the research and development manager for Frontline BioEnergy, said an ethanol plant that produces 100 million gallons per year could buy enough biomass to add $10 million per year to the local economy. He also said repowering conventional ethanol plants with biomass-based gas could create more than a thousand new engineering and construction jobs over a 10-year conversion period.

Brown says all that can add up to "a potential evolution of the ethanol industry."

Zou's CAREER award combines nanotechnology and biomedical research

Over the past four years, **Qingze Zou** has been working to increase the speed of a scanning probe microscope (SPM) with ambitions to improve the technology as our eyes and hands to see, touch, and manipulate matters in the nano world.

His research as an assistant professor in mechanical engineering has been delivering promising results, which is an important asset for his next project—characterizing soft materials such as DNA or cells. Recognizing the importance and potential of this work, the National Science Foundation (NSF) selected Zou to receive a CAREER award to support the investigation.

Qingze Zou is researching ways to characterize soft materials using a scanning probe microscope.

The challenge of this new project rests in the limitations of SPMs to work with these materials, as soft materials are dynamically evolving, making them difficult to characterize.

"Under current methods, the SPM can only measure the material viscoelasticity over a very limited frequency range, and the measurement time can be long, which generates large temporal measurement errors as the soft material itself can evolve quite rapidly," Zou says. "I'm looking to new control algorithms to enable the measurement at a much larger frequency range within a much shorter time frame." With these new control techniques, the SPM can acquire the necessary material response data quickly prior to the material's properties changing substantially, without inducing undesired motions.

The applications of Zou's work are important in areas including biomedical sciences and nano/biomaterials. With such precise measurement capabilities, researchers can gain a better understanding of rapid nano phenomena like cell healing and dentin collagen dehydration, as well as accelerate the synthesis and design of nano/biomaterials such as biocompatible polymers for drug delivery.

NSF gives CAREER awards in support of the early career-development activities of tenure-track assistant professors who most effectively integrate research and education within the context of their organization's mission. Zou was awarded a $400,000, five-year grant for his research project entitled "CAREER: Control Tools for Nanoscale Rapid Broadband Viscoelasticity Measurement and Mapping of Soft Materials." The project will begin this summer and continue through 2014.

Alumni notes

Joshi

Sada Joshi, president, Joshi Technologies International, Inc., a Tulsa-based petroleum engineering and production firm, received the 2009 Governor's Award for Excellence in Exporting. Oklahoma Secretary of Commerce and Tourism Natalie Shirley presented the award during the 26th Annual Oklahoma World Trade Conference held at the Reed Center in Midwest City, Oklahoma. Joshi received his PhD in mechanical engineering from Iowa State in 1978, after which he became a faculty member until 1979.

Lee Beck, an Iowa State senior studying horticulture, food science, and Spanish; **Chris Deal**, ME'08; **Gregory McGrath**, ME'08; and **Wes Meier**, ME'08, are executive directors for EOS International, a nongovernmental organization dedicated to building emerging opportunities for sustainability. Deal is currently studying renewable energy in a master's program at Makerere University in Kampala, Uganda; McGrath is a project engineer at General Mills; and Meier is carrying out a Peace Corps volunteer assignment in rural Nicaragua. More information about the organization can be found at www.eosintl.org.

Meier and McGrath, two executive directors of EOS International, worked on an engineering project in Mali, Africa, during their time at Iowa State.

Share your memories of Iowa State ME

We are always interested in what's going on with our alumni, and we enjoy hearing your recollections about your days as an ME student. Please submit your memories or an update with your name, type of degree, and year of graduation to mealumni@iastate.edu. We look forward to hearing from you.

Kiewit leaders join mechanical engineering department in dedicating student services

Undergraduate students in the mechanical engineering department have a new home for advising and academic support. The Kiewit Undergraduate Student Services Center, which has been up and running since the beginning of the spring 2009 semester, was dedicated during an afternoon reception on April 8, 2009.

The center was constructed through a generous pledge of $200,000 from Kiewit Corporation and will help the department ensure academic and professional success for its undergraduate students.

Several leaders from Kiewit joined mechanical engineering faculty, staff, and students at the event, including Bruce Grewcock, president and CEO of Kiewit Corporation, and Bob Taylor, an Iowa State alumnus and vice president of Kiewit Power, a subsidiary of the company.

Taylor, who was instrumental in organizing the gift to the department, said, "Kiewit has a great partnership with Iowa State. Supporting the mechanical engineering department's undergraduate student services center allows us to contribute to this great university and its engineering college and, most importantly, help students get the most out of their academic experience."

Bruce Grewcock, president and CEO of Kiewit Corporation

Kiewit, one of North America's largest and most respected construction and mining organizations, has a rich history with Iowa State's College of Engineering, providing support of student study centers, scholarships, capstone programs, and construction and renovation projects for several of the college's departments.

As the first named space in the Henry M. Black Engineering Building, the center has doubled in square footage from the previous advising area. The department's three academic advisers say the new space is welcoming to students and visitors and allows them to provide more extensive services to students.

Within the center, there are two on-site computers for students to register for classes, a monitor that broadcasts announcements, and a help room. Additionally, a wall display showcases accomplishments and awards of students, student organizations, and the center.

Students begin interacting with the center early in their academic career, working with the department's advisers and meeting with current students as they decide where to attend college. Once they join the department, students visit the center for orientation and help with course selection and other advising needs.

At Iowa State, mechanical engineering is the most popular major on campus, with more than 1,000 enrolled undergraduates, and is ranked in the top ten nationally in terms of bachelor's degrees awarded.

"Our undergraduate students have diverse academic and extracurricular interests, and many of them seek research positions, join several student organizations, or study abroad," said **Ted Heindel,** interim department chair of mechanical engineering and Art and Priscilla Bergles Professor of Thermal Science. "The Kiewit Undergraduate Student Services Center provides important resources that help students accomplish their goals and enjoy all the opportunities available to them."

Kiewit has identified mechanical engineering as a growing career field, and, as it continues recruiting throughout North America for many engineering disciplines, the need for mechanical engineers is ranked among the most essential.

Brown named to endowed chair in mechanical engineering

As an educator, researcher, and engineer concerned about the increasingly uncertain state of the world's energy resources, **Robert C. Brown**'s focus on clean energy technologies has helped shape the bioeconomy into what it is today.

With additional support provided through the Gary and Donna Hoover Chair in Mechanical Engineering, Brown now will be able to help push the bioeconomy movement forward with greater fortitude, advancing the use of biorenewable resources for manufacturing energy, fuels, materials, and chemicals.

The endowed chair position, first announced in December 2007, was created through the generosity of Gary Hoover, a 1961 Iowa State University mechanical engineering alum, and his wife, Donna. It was awarded to Brown in October 2008.

The Hoovers couldn't be more pleased that Brown received the position. "It is important to us that the College of Engineering uses this newly created position to ensure that Iowa State maintains its leadership position in developing alternative energy technologies," they said.

Their reaction is not surprising considering Gary Hoover's career experience. He worked for 20 years in leadership positions at Westinghouse and later was a principal in forming Tenaska, Inc., a company that designs, develops, constructs, and operates large-scale power plants. Donna Hoover was also part of Tenaska's start-up team, providing critical administrative skills in the company's early years. "We look forward to seeing firsthand the work that Dr. Brown is doing and how it will play out in the industry," the Hoovers said.

Looking forward to the future as well, Brown reflected on the advantages of holding the position. "The Hoover chair provides me a 'bully pulpit' from which to advocate something important to both Gary Hoover and me in our careers—energy," he said. "I am grateful to the Hoovers for helping me pursue my lifelong interest in energy."

Brown's pursuit is far from over, and he is ready to do more. "Although research into advanced biofuels has demanded most of my attention in recent years, I would like to help Iowa State engage more broadly on the issues of clean energy and sustainability," he said.

Ted Heindel, interim department chair of mechanical engineering and Art and Priscilla Bergles Professor of Thermal Science, also recognizes the great potential this gift brings to Brown and Iowa State. "The Hoovers have been long-time supporters of Iowa State, and this gift demonstrates their dedication to giving back to the university and helping future students, whom they recognize as tomorrow's leaders," he said. "The benefits of Dr. Brown's research extend beyond advancing the engineering profession to helping our students work with and learn from world-class leaders in research, education, and academia."

Brown was recently named Anson Marston Distinguished Professor of Engineering at Iowa State. He is a professor of mechanical engineering, chemical and biological engineering, and agricultural and biosystems engineering. Additionally, he serves as the Iowa Farm Bureau director of the Bioeconomy Institute, coordinating research, education, and outreach activities related to biobased products and bioenergy. Brown's research and the support of the Hoovers help the College of Engineering advance its 2050 Challenge, a strategic directive that is dedicated to meeting the critical challenges that will occur over the next four decades. The College of Engineering is taking the lead in Iowa and throughout the global community to help meet these challenges by performing cutting-edge research and educating tomorrow's innovators and leaders.

ME adds senior lecturer to faculty

Emmanuel Agba joined the mechanical engineering department as a senior lecturer on February 16, 2009. Agba served for eight years on the faculty of Mississippi State University (MSU), where he taught courses in mechanical design and manufacturing. He started MSU's Center for Integrated Manufacturing, and he was lead professor for his department's computer-aided design and manufacturing courses.

In 2000, Agba left academia to join the Ford Motor Company as manufacturing manager in the powertrain operations division. He oversaw Ford Powertrain's global effort in virtual manufacturing engineering development and implementation. Agba is a technical leader, a registered professional engineer, a certified Six Sigma black belt, author of 24 conference and journal publications, and holder of a U.S. patent. During this spring semester, he was involved with instruction for the laboratory and project components of ME 270, 324, and 415. He taught a variety of mechanical engineering courses in the general areas of design, CAE, and manufacturing.

Interact with the College of Engineering!

There are two new ways you can keep in touch with the College of Engineering. Follow the college on Twitter at http://twitter.com/ISU_CoE and become a fan on Facebook at www.eng.iastate.edu/facebook. Both of these social networking sites will connect you to other alumni, as well as let you know about events and news going on around campus. Plus you can chime in with your two cents as well!

Do you remember?

We keep finding interesting things out about the department, but we need the full story. Do you know any information about the manhole covers that say Mechanical Engineering on them? They are still in use across campus and have the Iowa State College mark on them. Send memories about the mechanical engineering manhole covers and your experiences in Iowa State's mechanical engineering department to mealumni@iastate.edu. Be sure to include what you are up to now, your degree earned, and your year of graduation.

In the fall 2008 issue of *Dimensions*, the "Do you remember?" feature included four photos we found in our archives. Here are the responses from a few Iowa State alumni.

Dave Hamm, BSNucE'91
The top photo shows the reactor control console. The chart recorder shows an ink line on the far left of the chart, and this would indicate that the reactor power level is very low, so the photo was probably taken during a start-up.

The second from the top shows work activities on top of the reactor, and since the crane hoist is in use they are probably lifting the containment blocks. This would indicate that they might be preparing to place an experiment, radiation monitor, etc., in the core.

The third photo shows an experiment assembly, which is pointed at a radiation monitor, so it is probably loaded with a radioactive material.

The bottom photo shows two guys in front of a wall with a hose duct hanging down. I'm not sure what they are doing, but it is obviously an experiment. It may have been taken on the south end of the reactor, where there was a removable shield block that allowed access to a small portal. This portal ran from the interior core out to the south shield and was used to allow a "neutron" beam to pass to the exterior of the shield for experiments. It may have also been taken in the experiment lab room (on the north side of the NEL), where many experiments were done with concrete blocks used as shielding as shown in the picture. Low enriched uranium cylinder bars were used as radiation sources for experiments associated with radiation detection and measurement.

Photo by Bob Elbert

Charles W. Sayles, MSNucE'60, PhDNucE'64
It is the UTR-10 nuclear training reactor. It first went critical in the fall of 1959, my first year at Iowa State as a graduate student in nuclear engineering. The nuclear was very low power, producing on 10 watts. It was used mostly for training purposes in the nuclear engineering department but was used to irradiate seeds and semiconductors for other departments.

The topmost photo is a picture of the operator's control panel for starting up, running, and shutting down the UTR-10 nuclear fueled reactor on the west side of the campus at ISU. The picture just below that looks like preparations to refuel the reactor or at least gain access to some of the extra nuclear fuel that was once stored there.

Michael J. Teply, BSNucE'79
The UTR-10 is a 50kw thermal (unless they did a power-up rate, but I doubt it) nuclear reactor. It was built in 1956 (the same year I was born) by a company more famous for toilets than nuclear reactors. The unique feature of this reactor was that in order to completely shut it down, you had to drain (we in the nuclear engineering program from 1976 to 1979 affectionately called it "flushing") the water out of the reactor. Without the moderator to slow down the neutrons, the extremely low heat generated by the reactor made this possible without the result being the dreaded CHINA SYNDROME.

My father actually had to "pull criticals" on the UTR-10 as part of his becoming a fully licensed reactor operator back in the early 1970s. He went on to be the operations manager of the Duane Arnold Energy Center.

The nuclear engineering program was in accreditation when I changed my major from engineering science to nuclear engineering in 1976. I graduated with a BS in 1979 as one of the first undergraduate nuclear engineers to graduate from Iowa State.

I, too, worked at the Duane Arnold Energy Center near Cedar Rapids, Iowa, from 1980 until 2003. It's great to see the old UTR-10 has been remembered.

Thanks to all the alumni who responded!

Robb Borland, BSNucE'80, MSNucE'82
Donald E. Hall, PE, MSNucE'82
Dave Hamm, BSNucE'91
Margaret (Girton) Harding, BSNucE'81
Mike LoCascio, BSNucE'89
George F. Niederauer, PhDNucE'67
Charles W. Sayles, MSNucE'60, PhDNucE'64
Michael J. Teply, BSNucE'79
Mike Winter, BSNucE'86, MSNucE'87
Kevin Wright, BSNucE'89

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