StoutQuest

The Journal of Research at the University of Wisconsin-Stout 2011–2012

UNIVERSITY OF WISCONSIN
STOUT
WISCONSIN'S POLYTECHNIC UNIVERSITY

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Provost's Office at
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Julie Furst-Bowe, Provost

Sue Foxwell, Executive Editor
and Research Administrator

Jerry Poling, Editor

Contributing Writers
Doug Mell
Jerry Poling
Hannah Flom

Graphic Design
Jill Olsen

715-232-1126

stoutquest@uwstout.edu

Find this publication and additional information about the scholarly activities, publications and presentations of UW-Stout faculty and staff online at **www.uwstout.edu/rs/stoutquest.**

On the cover:
Matthew Kuchta, a physics professor at UW-Stout, began a geology study last summer of the lower Red Cedar River near the UW-Stout campus. Among the discoveries made by Kuchta and a student intern were pieces of charred wood that were thousands of years old. Read more about the study on Page 12.

Chancellor's **Message**

Each year StoutQuest magazine chronicles the impressive array of research being conducted by faculty, students and staff at University of Wisconsin-Stout, Wisconsin's Polytechnic University.

This fifth annual edition is no different. It reflects our campuswide dedication to inspiring innovation through applied research.

Among faculty, you'll find stories about Matthew Kuchta studying the geology of the Red Cedar River, Scott McGovern examining blue-green algae in Lake Menomin and Naveen Chikthimmah working with the campus Discovery Center and industry partners on food science issues. Tamara Brantmeier produced award-winning art, Amy Schlieve co-authored a book on helping teenagers and Joongmin Shin co-authored research on fresh asparagus.

Among students, McNair scholars spent their summers doing research in North Dakota and New York, a student received a grant to examine the feasibility of composting in Menomonie and teams in packaging and apparel design and development won international competitions.

This summer, UW-Stout will be offering a research experience for undergraduates. A $214,000 National Science Foundation grant was awarded to the math department for 2012-14. Six students each year from around the U.S. and two from campus will have an intensive eight-week math research experience at UW-Stout through the NSF research experience for undergraduates program.

We're also excited about growth at the Center for Applied Ethics under new Director Elizabeth Buchanan. The CAE staff is focused on three key areas: research, infusing ethics across the curriculum and community engagement. The center, which opened in 2008 as the result of an anonymous endowment, also received a collaborative $400,000 NSF grant in 2011.

We are proud of the applied learning model, faculty-led research, campus facilities and technology that help make research a part of the culture at UW-Stout. As always, we continue to look for new ways to inspire innovation.

Charles W. Sorensen
Chancellor


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About Research at the **University of Wisconsin-Stout**

Applied research has a long history at UW-Stout. Since the institution's founding in 1891, students, staff and faculty members have benefited from a culture guided by principles of putting theory into practice. Today, real-world projects are regular occurrences in the environment of teaching, learning and discovery at UW-Stout. And, since the university was designated Wisconsin's Polytechnic University by the UW System Board of Regents in March 2007, UW-Stout has placed even greater emphasis on research.

About Stout**Quest**

StoutQuest is the UW-Stout journal of faculty and staff research. The journal highlights the growing and diverse scholarship and applied research that happens every day among faculty, staff and students of Wisconsin's Polytechnic University.

For more information about **UW-Stout Research Services:**

Research Services
152 Vocational Rehabilitation Building
University of Wisconsin-Stout
Menomonie, WI 54751

Phone: 715-232-1126
Fax: 715-232-1749
Online: www.uwstout.edu/rs


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Ethics **Infusion**

New leader moves Center for Applied Ethics forward through research and campus, community engagement

The Center for Applied Ethics is on the fourth floor of the Robert S. Swanson Learning Center. The staff includes, front row from left, graduate assistant Kellen Dins, Director Elizabeth Buchanan and associate director Tim Shiell. Back row, community representative Grant Steves, graduate assistant Shannon Herrick and administrative specialist Stefanie Jax.

Center for Applied Ethics
430 Robert S. Swanson
Learning Center
715-232-5184/5185
www.uwstout.edu/ethicscenter
Twitter: #stout_ethics

Elizabeth Buchanan, Ph.D., hit the ground running — like the old saying goes — in her first year as director of the Center for Applied Ethics at UW-Stout.

Buchanan began work Feb. 1, 2011, as the first endowed chair in ethics. She proceeded to make immediate impacts in the areas of research, campus outreach and community engagement.

The center, which opened in 2008 as the result of an anonymous endowment, is a campus and community resource intended to infuse ethics across the curriculum, campus life and the community. Through its diverse research agenda, the center is achieving its mission in many ways.

In addition to a $400,000 collaborative National Science Foundation grant, Buchanan and the center's associate director, Tim Shiell, Ph.D., have delivered more than 50 presentations, ranging from campus workshops to national and international conferences such as the Polytechnic Summit, Ethics Across the Curriculum, The Dalton Institute, International Association of Computers and Philosophy, and Public Responsibility in Medicine and Research, to name a few.

Shiell, the former center director who has returned to the English and philosophy department to teach, and Buchanan work closely on the center's research and programming. With a small but dedicated staff, the center is poised for bigger and better things in the years to come, Buchanan said.

"UW-Stout has such a strong reputation for applied science and research, and ethics must be a part of that. I was attracted here to help strengthen an already wonderful campus and community," Buchanan said.

"As a colleague of mine once wrote, 'Nothing is more important than the way we treat each other.' At its core, ethics allows us to think long and hard about being good people and good professionals. UW-Stout values this way of thinking."

Ethics research drives the center and guides Buchanan and Shiell as they assist faculty and staff across campus.

Three major projects are under way:

National Science Foundation study

First, exploring the ethics content and pedagogy in computer and information

technology programs is the focus of the collaborative NSF-funded project.

With Buchanan as principal investigator, the project is a two-year systematic study with three other universities, CUNY Brooklyn College, University of Maryland College Park and University of Illinois-Springfield. To date, the research team has collected fascinating data about perceptions of ethics, codes of conduct and professional ethics, she said.

Ultimately, the project will provide data to help students enter the workforce with a sound understanding of ethical decision making, professional ethics and professional standards, while providing information and computer science faculty with pedagogically appropriate materials, exercises and teaching strategies.

Measuring ethics

Second, the Center for Applied Ethics is collaborating on a large-scale survey project of students' moral development.

Working with about 20 universities, including St. Louis University, University of Ottawa, Oregon State and Colorado State, over several years the center will organize groups of instructors to pilot test a new ethics assessment instrument and analyze data from the groups. The instrument was developed by Professor Howard Curzer of Texas Tech University.

The instrument is designed to measure the level of sophistication with which students reason about ethical dilemmas, whether they make ethical progress during a particular course and to examine the ethical framework of a student's thinking.

If the pilot testing is successful, the instrument will become a valid empirical method available for use by educational institutions, business and industry.

> ***I was attracted here to help strengthen an already wonderful campus and community. – Elizabeth Buchanan, Ph.D., director, Center for Applied Ethics***

Fostering academic integrity

Third, the center is collaborating with the Nakatani Teaching and Learning Center, the Dean of Students Office, the library and Advising Center on examining academic integrity and rigor.

The center received funding from the UW System Office for Professional and Instructional Development to host a workshop in February on student success and fostering a culture of academic integrity.

The research on academic misconduct is alarming, Buchanan said. The informal Stout Academic Integrity Working Group has been meeting and working on strategies to improve students' understanding of misconduct but, more importantly, to foster positive change and promote academic rigor.

"Students need to understand the complexities of this increasingly global, technologically mediated world, and one way to help this understanding is through ethics," Buchanan said.

Community outreach

Buchanan is active across campus, and to her every day is an opportunity.

"I visit with different departments, speak with faculty, students and staff and continually look for ways to bring ethics and the center to people's attention. We have a lot to offer at the center. As the campus embraces its new social responsibility and ethical reasoning general education courses, we have ample research to draw from and examples to assist faculty and staff. It is an exciting time."

Buchanan also has strengthened connections between the center, UW-Stout and the community. She has spoken at the Kiwanis, Rotary and Optimists civic groups, seeing this as an imperative. "It is important to bridge the campus and community groups," she said. "Civic engagement and social responsibility are crucial."

The Center for Applied Ethics staff, with the support of the Alumni Association and University Foundation, hosted a successful event in November at the Mabel Tainter Center for the Arts, where they coordinated the premiere of an award-winning documentary, "Buried Prayers," about the Holocaust.

More than 200 people attended the premiere. The event culminated in a discussion with Steven Meyer, director and producer of the documentary. Meyer said he was touched by the outpouring of support for the film.

Buchanan busy as a scholar

In addition to campus and community events, Buchanan keeps busy as a scholar. She is writing an entry for the prestigious Stanford Encyclopedia of Philosophy and is beginning a co-authored book project.

She has published four scholarly papers since she joined UW-Stout. She is an associate editor for the Journal of Empirical Research on Human Research Ethics and serves on two additional editorial boards: the International Review of Information Ethics, and Philosophy and Technology. She reviews papers and proposals for many other journals and granting agencies.

Buchanan also is principal investigator to the Internet Research Ethics Commons (internetresearchethics.org) at UW-Milwaukee, where she received

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The Power of **Research**

Professor has seen undergraduate research as high-impact practice pedagogy transform her students

When 25 UW-Stout students had their work accepted last year for the National Conference on Undergraduate Research at Ithaca College in Ithaca, N.Y., it was cause for personal celebration.

Each student had completed a challenging academic journey — from reluctant researcher who lacked confidence and skills to a student who had taken on a complex challenge and met his or her research goal.

They had reached a national stage. How did they do it? High-impact practice.

Susan Wolfgram, Ph.D., an associate professor in the human development and family studies program, in earlier years referred to this type of pedagogy as action learning. In the past few years, it has been researched by George Kuh and others and is now referred to as high-impact practice.

Undergraduate research is one of 10 high-impact practices. It is a teaching method by which undergraduates co-create knowledge through inquiry and collaboration with faculty and their communities as opposed to receiving, memorizing and re-presenting knowledge passed along to them from faculty, Wolfgram said.

In other words, students are transformed by learning how to do research in this high-impact context.

For the past seven years, Wolfgram has taught her HDFS Research Methods course in this manner. Ten of the students who went to NCUR in 2011 were taught by Wolfgram.

"Mentoring is core. I take them step-by-step to demystify the process. I am more of a coach than a teacher at times," Wolfgram said. "It is successful because of the high levels of engagement; a pedagogy that is relevant to their lives and gives them a toolkit of skills to take with them and compete for career positions as well as being accepted into graduate school."

The benefits are many

She is sold on the benefits of this high-impact practice, especially because it leads to "increased retention and graduation of underserved groups of students, which I am committed to in terms of my research and teaching.

"Research gives our students a chance to take their learning outside the classroom and collaborate with community agencies and other faculty on campus, as well as contribute to the family studies field through a best practices approach," Wolfgram said.

The process includes going through the Institutional Review Board, collecting and analyzing data, and synthesizing it

Susan Wolfgram

Researching High-impact Practice at UW-Stout

In 2011 four UW-Stout faculty received a UW System Institute of Race and Ethnicity grant to identify how high-impact educational practices have affected retention and graduation rates of underrepresented minority students at UW-Stout.

The faculty are Susan Wolfgram, Ph.D., human development and family studies; Glenda Jones, Ph.D., women and gender studies; Suejung Han, Ph.D., psychology; and Jeffrey Sweat, Ph.D., applied social science.

In October 2011, they presented "High Impact Practice as Transformative Pedagogy" at the International Society of the Scholarship of Teaching and Learning Conference in Milwaukee. In January 2012, they also presented at the High Impact Practices: Fostering Success for all Students Conference held at UW-Green Bay.

into a final manuscript. It helps students develop oral, written and presentation skills.

The process also helps them break down a large project into sequential steps with much attention to detail and time management, she said.

"Stout is all about applied learning and developing a 21st century set of skills," Wolfgram said. "The kind of confidence students gain through research is transformative for them as individuals and young professionals."

All seniors in human development and family studies take the Research Methods course in randomly selected pairs. They collaborate and generate their own research questions, which are most often connected to their career interest.

"The choosing of their own research questions, which are connected to their career interests, makes the work relevant to them. They are doing real work. Most students collaborate with nonprofit agencies in the community to enhance their civic engagement," Wolfgram said.

Students have many dissemination options. They can compete to publish their work in the UW-Stout Journal of Student Research or submit to other scholarly journals; present their work at NCUR or other national conferences; and take part in UW-Stout Research Day and the UW System Research Symposium. Wolfgram also allows students to post their research on YouTube to reach an even wider and more diverse audience with their findings.

She credits the opportunity to use this high-impact practice and the dissemination methods to Research Services, College of Education, Health and Human Sciences Dean Mary Hopkins-Best, department chair Bob Salt "and the many on-campus and community collaborators."

"Students can look at the problems of the world and realize that they can contribute one small step to their field to make a difference, along with an appreciation of thinking through problems with the benefit of research, theory and best practices," Wolfgram said.

Student Impact

High-impact practice is a pedagogy that facilitates undergraduate student learning to co-create knowledge through inquiry and collaboration with faculty and their communities. Susan Wolfgram, who teaches in human development and family studies, believes it's transformative. Here is a testimonial from one of her students, Shiloh Herrem, who worked with the regional community action agency West CAP to evaluate its JumpStart program, which provides low-income residents with reliable transportation to get to work:

"I met with Robyn from West CAP. She's amazing. I discussed my research project with her and she agreed to help out. The next day, she called and asked if I would be interested in sitting in on a meeting they were having with a representative from the state Administration for Children and Families to discuss my research. That meeting was today. It was a very surreal experience — talk about networking. The man I was introduced to is 'excited' to use my research. They would like to replicate the JumpStart program and were really looking for research that addresses how these vehicles improve quality of life for low-income households, which is exactly what my topic is. I have never been in a room with people who were really interested in what I had to say. It was crazy!"

"The choosing of their own research questions, which are connected to their career interests, makes the work relevant to them. – Susan Wolfgram, associate professor, human development and family studies"

A total of 25 UW-Stout students, including this group of human development and family studies majors, had their research accepted in 2011 for presentation at the National Conference on Undergraduate Research in Ithaca, N.Y.

Coming **Attraction**

Three-year NSF grant will bring undergraduates to campus for summer research experience in math

UW-Stout math faculty worked with students earlier this year. A new summer research program will last eight weeks. From left are Ian Ziemba, Assistant Professor Alexander Basyrov, Associate Professor Matthew Horak, Benjamin Jones, Audrey Freischel, Austin Spaulding and Marlee Redmann.

UW-Stout 's role as an institution that encourages and sponsors research will continue to grow with a new, prestigious program in 2012.

The university's math department was awarded a three-year, $214,837 National Science Foundation grant to develop a research experience for undergraduates. It is believed to be the first such NSF-funded program in the university's history.

During the summers of 2012-14, six students from across the U.S. and two UW-Stout students will be chosen each year to participate in the intense, eight-week program.

Five members of the math department, all with previous experience in directing undergraduate research, are involved. The leaders are Matthew Horak, Ph.D., and Alex Basyrov, Ph.D. Mentors are Steve Deckelman, Ph.D., Amitava Karmaker, Ph.D., and Seth Dutter, Ph.D.

The research will focus on using computational tools to address geometric questions in algebra and analysis. "Students will be working with faculty who are doing research and producing new results," Horak said.

Research experience for undergraduates, or REUs, typically are for students going into their third or fourth year in college, Horak said. UW-Stout's program will be open to all students, but the "development activities will particularly benefit first-generation students," he said.

Participants also must be U.S. citizens or permanent residents.

"The idea is to introduce students to what they could expect if they went to graduate school. They will be working with people from all over. That's an important part of the process," Horak said.

Students generally will put in 8 a.m. to 5 p.m. days in the classroom and labs during the eight weeks. In the

The UW-Stout math department will host a research experience for undergraduates program beginning in summer 2012. Associate Professor Matthew Horak worked with student Audrey Freischel during a February 2012 lab session.

Summer Research

Five UW-Stout students were chosen for REUs — or research experience for undergraduates — in summer 2011.

"All the faculty promote these exceptional experiences," said Charles Bomar, biology professor. "Students find an opportunity that matches their interest, and faculty help them with their applications."

The students who received the awards and the schools where they conducted research are:

- Justin Halverson, math, Brigham Young University
- Noah Holzman, nanotechnology, Coe College
- Brittany Johnson, science education, St. Olaf College
- Austin Schwartz, nanotechnology, Iowa State University
- Kiel Tietz, biotechnology, Ohio State University

process, they will learn a number of "skills necessary for success in mathematical research," Horak said.

On the weekends, the professors will introduce them to west-central Wisconsin through sightseeing and cultural excursions.

Horak is a firm believer in the REU experience. As an undergraduate at Northern Arizona University, he participated in a summer REU to Hope College in Holland, Mich. During those eight weeks, he came to understand how new mathematics is created and that he had the ability to contribute to the field.

"I wasn't completely sure I wanted to go to graduate school, but that experience solidified my intentions," he said.

> ***The idea is to introduce students to what they could expect if they went to graduate school. They will be working with people from all over. That's an important part of the process. – Matthew Horak, associate professor, math***

Ethics **Infusion**

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an NSF grant to create the commons. The grant remains at UW-M, as it was under the federal stimulus act, the American Recovery and Reinvestment Act of 2009. She continues to work on the grant and resources for research ethics boards and Internet researchers.

Buchanan receives many invitations from research ethics boards around the country and abroad and enjoys the opportunity to engage with other researchers, scholars and practitioners.

All these experiences, Buchanan says, fuel her agenda for the center at UW-Stout. "I can bring back novel ideas, new strategies for effective ethics infusion, fresh ideas for research projects. Working at UW-Stout in such an interdisciplinary role, it is important for me to glean as many perspectives as possible. These can only help me do my job better."

Buchanan has double bachelor's degrees from Rutgers University and a master's and doctorate from UW-Milwaukee. In 2008 and 2009, she was a research fellow at the University of Oxford's e-Research Center in Oxford, England.

She came to UW-Stout from UW-Milwaukee. There, she was director of the Center for Information Policy Research from 2006-10 and taught in the UW-Milwaukee School of Information Studies from 2000-10.

Student in Residence

From Feb. 1 through June 1, 2012, the Center for Applied Ethics is hosting a student from Finland who is working on her dissertation on online ethics and social work. Camilla Granholm is from the Swedish School of Social Science, University of Helsinki.

Naveen Chikthimmah, assistant professor in food and nutrition, worked in a food lab with Joel Weyenberg, a senior in food systems and technology.

Recipe for **Success**

Professor, students research food science issues through the Discovery Center

Pizza dough. Gouda cheese. Pie crusts. Chicken pot pie. It's not a shopping list. It's a partial list of foods that have been the topics of recent applied and industry-collaborative research led by Naveen Chikthimmah, Ph.D., an assistant professor in the food and nutrition department.

In addition to conducting valuable research for industry clients, Chikthimmah brings his undergraduate and graduate students into the inquiry process to enrich their academic experience and to enhance their research methodology skills.

"Naveen challenges his students' skills as they forge new ground infusing food ingredients or altering (optimizing) processes that result in improving commercial products," said Randy Hulke, director of the university's Discovery Center, which is two years old.

More than 150 students from all four university colleges were involved in Discovery Center projects in 2010–2011. Four of Chikthimmah's recent studies have been through the center, which advances the university's applied research model through interdisciplinary collaboration.

"The projects are each given the attention and care they deserve, with the industry partner actively participating in the product development or process optimization," Hulke said.

The Discovery Center facilitates the development and execution of these collaborative projects to allow faculty, staff and students to focus on applying research to solve project challenges.

One such customer was Grateful Grains, a Viroqua-based company that makes gluten-free foods. Gluten sensitivity and gluten-related allergies create special dietary needs for some people, including a gluten-free dietary choice of food. While gluten is an essential ingredient in sheeting regular wheat-based dough, the sheeting of gluten-free dough was investigated for process optimization by Chikthimmah, co-investigator Hans Zoerb and graduate student Meshack Onderi.

The researchers refined and scaled an artisan-style pizza crust by using low levels of xanthan gum, a natural carbohydrate that delivers gluten-like characteristics in dough. They examined the crust's texture, rheology, and sheetability of the dough during commercial processing.

As a result of the research at UW-Stout, Grateful Grains is test-marketing the recipe.

In another study on Gouda cheese, Chikthimmah, Zoerb and student Dan Vanevenhoven examined the effect of aging time on cheese texture when unpasteurized milk was used.

"Aging time is an important parameter influencing the quality of cheese. For artisanal cheese producers, determining the effect of aging time on cheese rheology is important for quality and process optimization.

"The study serves as a model for artisanal cheese producers to establish quality parameters based on rheological measurements," Chikthimmah said.

Another study was conducted by Chikthimmah, student Sravya Saranga and Peter D'Souza, associate professor in hospitality and tourism. They

Discovery Center
278 Jarvis Hall Tech Wing
410 10th Ave E
Menomonie, WI 54751
715-232-2565
discoverycenter@uwstout.edu
www.uwstout.edu/discoverycenter

studied the prevalence of Listeria monocytogenes, a foodborne bacteria in small and medium food service establishments.

This research was funded by UW-Stout Faculty Research Initiative funds with the overall goal to train UW-Stout students in food safety risk management while collecting valuable baseline and characterization data on the bacteria, Chikthimmah said.

Public **Discourse**

Environmental Sociology class holds public event to discuss research topics with the community

Nels Paulson

How does the issue of labor exploitation affect the environment? This is just one of the questions a group of students researched in the Environmental Sociology class taught by Nels Paulson, Ph.D., an assistant professor of social science.

Students presented their research in spring 2011 to the public during Sustainable Communities: A Dialogue at the Raw Deal in downtown Menomonie. They displayed research posters and informally discussed their topics with the community.

The goal was to synthesize research that has been done on the relationship between society and the environment and to show patterns within the studies. “If students don’t understand how society works, they can’t have a meaningful impact on environmental issues,” Paulson said.

Nicole Ries, an applied social science major, researched labor issues and how they can negatively impact the environment. Other student topics included global climate change, industrial hog farming, water quality and dwindling open spaces.

“For me, labor equity is very important. I don’t buy things that have caused people to be exploited,” Ries said. “A lot of times people have reduced labor to being just another resource.”

The research by Ries and her classmates offered workable solutions — actions everyone can take — to the problems they studied. “That’s the most important element of our research,” Ries said.

Paulson said the class decided to add the public aspect as part of the research process “to expand the dialogue. Our class discussions were very rich and the papers were very good. Students wanted to extend those discussions to the larger community.”

Along with Ries, class members were Maren Conradi, Andre’a Dahlgren, Sarah Etlicher, Christopher Fox, Rebecca Greenfield, Justin Juntunen, Isak Peterson and Jake Twaddle.

Bottoming **Out**

Professor digs deep during geology study of Red Cedar River

Matthew Kuchta pulled on blue laboratory gloves and placed a brittle piece of black and brown charcoal, about the size of a dime, under a microscope. “This probably was a hardwood tree,” he said as he examined the magnified wood fibers.

The tree likely burned sometime after the last Ice Age ended, he said. Then, over the course of the next few thousand years, pieces of the charred wood ended up embedded along what now is a stream bank in the lower Red Cedar River valley.

Kuchta, Ph.D., a physics department assistant professor, along with a student intern found the charcoal last summer while looking for clues to a natural mystery.

The many chunks of charcoal they dug out were a good start. The samples ranged from 400 to 9,000 years old and helped them begin to see the big picture — the haystack, as Kuchta calls it — of how the river has behaved in recent millennia.

Their goal is to get to the bottom of the lower Red Cedar River’s history, literally and figuratively, and learn valuable lessons from the research.

The Red Cedar River starts in Sawyer County and flows 85 miles before it empties into the Chippewa River northeast of Durand. The watershed drains nearly 1,900 square miles in parts of eight counties, including Dunn County as it passes through Menomonie and near UW-Stout.

Last summer was the initial stage of a research project Kuchta hopes will continue for several years. It is the first geology study of the lower Red Cedar. The geology of other major rivers in the region has been studied, but the lower Red Cedar has been virtually overlooked by scientists for the last 100 years, he said.

In fall 2011, students in Kuchta’s Soil Science class and Conservation and Soil Mechanics class moved the research forward by further studying the samples collected in the summer.

“It isn’t just research for research sake. It goes beyond the classroom and makes a contribution to understanding the environment we’re living in. Maybe we can use this to help identify potential conservation priorities in the future,” Kuchta said.

“We want to tie the Red Cedar River’s past to today. Where is it shoving sediment around now? What is the impact of the last 150 years of agriculture on the river?”

Kuchta presented his study, “Fluvial Development of the Lower Red Cedar River Valley,” at the Geological Society of America’s annual meeting in October at the Minneapolis Convention Center. His intern, Kate Gurke from Lawrence University in Appleton, presented a poster at the event. More than 6,000 scientists were on hand.

“One of the most surprising things we found is that postglacial erosion in the Red Cedar Valley may have had a

> ***“It goes beyond the classroom and makes a contribution to understanding the environment we’re living in. – Matthew Kuchta, assistant professor, physics”***

Matthew Kuchta, a physics professor at UW-Stout, began a geology study last summer of the lower Red Cedar River. He was assisted by intern Kate Gurke, from Lawrence University. Kuchta and Gurke found pieces of charcoal that were thousands of years old and charted ancient river terraces on large topographical maps.

strong impact on the (much bigger) Chippewa River. All the sediment being transported from the Red Cedar may have delayed erosion along the Chippewa River upstream in eastern Dunn County by over 1,000 years," Kuchta said.

"We often think of rivers as fairly simple systems where big changes are needed to control a river's ability to erode or deposit sediment on the floodplain and that bigger rivers just take the water and sediment from their tributaries and move it further downstream. The response of the Red Cedar to past changes was complex. After the Ice Age, relatively small changes in water and sediment supply resulted in large, long-lasting changes to the river's landscape."

Tangible evidence of the summer research resides in what Kuchta affectionately calls the Dirt Lab in Jarvis Hall Science Wing. The lab is filled with buckets of river sediment, glass beakers with cloudy water and scientific tools for studying sediment.

Gurke, a senior majoring in geology, came to UW-Stout for the summer as part of a program that matches Lawrence students with alumni at other universities. Kuchta graduated from Lawrence in 1998; he is in his third year teaching at UW-Stout.

Most of the funding for the summer project came from a Faculty Research Initiative grant through Research Services at UW-Stout.

Kuchta wrote his doctoral thesis on the geology of the Upper Mississippi River. "This summer represented a big step forward in understanding the Red Cedar," Kuchta said.

To see a related video about Kuchta's study, go to UW-Stout's YouTube channel at www.youtube.com/user/uwstoutvideos.

Tools of the Trade

During their river geology study, Kuchta and Gurke used:

- Large topographical maps to plot the river's terraces. Most of UW-Stout's campus, for example, is on one terrace or floodplain. The university's Challenge Course, on higher ground to the south on 17th Avenue, is on another terrace that is about 1,000 years older.
- Kuchta and Gurke mapped eight river terraces below Menomonie High School. The current riverbed near the city is about 100 feet lower than it was at the end of the last Ice Age about 15,000 years ago, Kuchta said.
- Radiocarbon-dating. Charcoal samples, sent off campus to be dated, helped reveal what was happening to the river and when. "If we get a radiocarbon date from charcoal buried beneath one terrace and a younger date from charcoal buried in a lower terrace, it gives us time brackets for when the river changed," Kuchta said.
- Charcoal samples came from eroding banks and abandoned stream channels along the Red Cedar River and Irving and Galloway creeks. Some charcoal samples were from trees and others from plant matter. "The presence or absence of wood helped determine the timing of an important ecological transition period. Forests yielded to prairies and grasslands," Gurke said.
- An auger and hydrometer. The auger was used to take soil cores of river sediment. The cores were analyzed with a hydrometer, whereby a sediment sample with sand, silt and clay is suspended in water, revealing the relative proportion of large and small sedimentary particles. Bigger pieces are deposited in fast-moving water and smaller pieces in slow-moving water. This helps piece together the river's history when the samples from different terraces and streams are compared.

UW-Stout student Benjamin Leist, right, of Manitowoc entered medical school in August 2011 after finishing science prerequisite classes at UW-Stout. He also conducted research while on campus. One of those projects, with biology Professor Ann Parsons, left, involved studying the effects of vibration treatment on the neuromuscular and skeletal systems.

A Vow of **Science**

Student completes transition from monk to medical school

Benjamin Leist has gone from the world of spiritual healing to the world of physical healing.

From prayer to science.

From a tunic to a white coat.

After earning his theology degree in 2004 from St. Mary's University in Winona, Minn., Leist was preparing to become a monk. He had joined the Norbertines of St. Norbert Abbey in De Pere, in east-central Wisconsin.

Leist was working toward a Master of Arts in theology and had been invited to take his vows when he came to the realization that life in the religious community wasn't for him. He discovered through personal reflection and multiple daily prayer sessions what inspired him most.

"I knew I needed long-term intellectual engagement and began to look at medical school," Leist said.

Top **Award**

Art professor wins Wisconsin Artists Biennial top honor

Tamara Brantmeier, program director and associate professor of art and design, recently created a series of paintings in impasto, a technique using a thick application of paint that leaves brush or palette knife marks.

One of those paintings made its mark on the Wisconsin arts scene. "Shift," a 4-foot by 5-foot oil painting on canvas, won the top award at the Wisconsin Artists Biennial 2011.

The painting "reflects what began as a search to make work that talked about my transition into parenthood and all the layers of complexity that come with that new identity," Brantmeier said.

Her portfolio can be seen at tamarabrantmeier.com/home.html.

The Wisconsin Artists Biennial, sponsored

In summer 2011, he took a major step toward that goal when he completed his prerequisites for medical school at UW-Stout and entered the Medical College of Wisconsin in Milwaukee. He hopes to become a surgeon.

A time of transition

After leaving the Norbertines, an order founded in 1121 in Europe, Leist began to teach part time and work in campus ministry at his alma mater, Roncalli High School in Manitowoc. He also began to take science courses at UW-Manitowoc. Three years later, in May 2010, he completed the Medical College Admission Test, or MCAT.

He still needed to fill undergraduate science requirements, however, before he could begin medical school. He contacted 30 colleges in the Midwest. UW-Stout's Charles Bomar, Ph.D., director of the applied science program, was one of just eight contacts who responded.

Leist was won over by UW-Stout's commitment to science. Leist found solid research opportunities and state-of-the-art science facilities. "It was a phenomenal experience. For an undergraduate institution, to offer this kind of research space and tools, it's unmatched," Leist said, referring specifically to UW-Stout's new Jarvis Hall Science Wing and research-focused culture.

Jarvis Hall, which includes the adjoining Tech Wing, is home to the College of Science, Technology, Engineering and Mathematics and the applied science program.

Leist's first summer at UW-Stout was spent as a student researcher in the National Science Foundation S-STEP grant program, "Portals of Discovery: Increasing opportunities in STEM through Collaborative Research."

The program was developed by UW-Stout biology professors Kitrina Carlson, Ph.D., and Michael Pickart, Ph.D., and UW-Manitowoc professors Rebecca Abler, Ph.D., and Richard Hein, Ph.D.

UW-Stout's applied science program offers a preprofessional track that prepares students to apply to schools for medicine, dental, chiropractic, optometry, pharmacy, physical therapy, physician's assistant and veterinary.

"Professors at Stout incorporate their own research within lab work. You get to see into the mind of another scientist," Leist said.

While taking six undergraduate science courses in 2010-11, Leist did cancer research with medicinal plants. He was one of five UW-Stout students chosen to display research during the annual Posters in the Rotunda at the state Capitol. His project, with fellow student Jordan Fouks, of Deer Park, was "Effects of Tradescantia Zebrina on Growth of SCC-13y Cancer Cells."

His advisers were Carlson and Pickart. Other students continued that line of cancer research in the fall, Pickart said.

"Through the study of the T. zebrina applications to cancer therapy, the portals project is doing what it set out to do — bridge two- and four-year UW System institutions through cross-campus student-faculty collaborations on real world research problems," Pickart said. "Ben's leadership has been a tremendous asset in making the portals project successful and motivating others to become involved in research."

Leist also presented research, along with biology Professor Ann Parsons, Ph.D., and Discovery Center scientist Bertram Ezenwa, Ph.D., at the first UW System Medical Device Symposium in June 2011 at UW-Stout. Their work looks at the impact of vibration treatment on the neuromuscular and skeletal system.

In medical school, Leist hopes to specialize in ear, nose and throat because that area of medicine offers him the chance to be a surgeon and do clinical research, he said.

and organized by Wisconsin Visual Artists, is a fine arts competition open to all visual artists in the state. More than 400 submissions were received, with works by 83 artists selected for the biennial exhibition at Anderson Arts Center in Kenosha.

In response to receiving the award, Brantmeier said, "I am very pleased to be acknowledged by such an accomplished artist — the juror, Ellen Lanyon — and to be in an exhibition with such a wide range of talented regional artists."

Lanyon said Brantmeier's painting was "the strongest ... the most accomplished and imaginative."

Tamara Brantmeier

Brantmeier has taught at UW-Stout for 10 years. She has an M.F.A. in painting and drawing from the University of Minnesota-Twin Cities.

"Shift," an oil on canvas by Tamara Brantmeier, won the Wisconsin Artists Biennial 2011.

Seven **Steps to Success**

Students learn creative, problem-solving approach in hands-on Functional Clothing Design course

An outsider peering into one of Gindy Neidermyer's Functional Clothing Design classes might wonder at times what's happening and what it has to do with clothing.

Neidermyer, Ph.D., and her apparel design and development students could be in the dark shining a flashlight on a reflective vest. Or trying to drop a boiled egg without cracking the shell. They might be examining how a stapler or cell phone works. Or shredding or setting material on fire. They might even be at Chippewa Valley Technical College in Eau Claire test-firing a gun at a shooting range.

These hands-on activities open the eyes of apparel design and development majors as they dive into the technical world of functional clothing — the specialized gear worn by people like police officers, firefighters and athletes.

It's all part of an exploratory process she wants them to grasp, a seven-step guide to creativity and problem-solving.

The actual steps — accept the situation, analyze, define, ideate (generate options), select, implement, evaluate — likely don't mean much at first to students. As their semesterlong design projects progress, however, Neidermyer reminds them to follow this veritable yellow brick road.

Time and again, she pulls out a tried-and-true textbook, "The Universal Traveler," where the steps are published to ask them where they are in the process and to get them back on track.

Dealing with the first step, accepting the situation, as it turns out is one of the most valuable aspects of the class. It involves learning how to work in groups.

"The class is really about learning how to problem-solve in a team. Students learn that a lot of great ideas don't just come from one mind," she said.

Many of the next steps involve an equally important lesson — doing research. Students spend the entire semester researching and designing a piece or related pieces of functional clothing.

Early in the class, Neidermyer instructs students to research and present reports on various special fabrics to again open their eyes to how this specialized industry works.

Then when they analyze and define their problem, Neidermyer may ask them to do primary research to develop a stronger connection to their design task.

For example, they once tried the campus rock-climbing wall when they were designing a safety harness suit. They interviewed Chancellor Charles W. Sorensen, who had been a recent hospital patient, before designing a hospital gown.

Understanding a problem is the key to solving it. "In life you're handed a lot of problems to solve that you don't have a great emotional attachment to. In order to get that emotional attachment, maybe you need to go out and experience the problem," Neidermyer said.

A shining example

Primary research helped a group of Neidermyer's spring 2011 students. They toured a mine in northern Minnesota prior to designing a new type of safety suit for underground miners. It helped them understand the types of mines and the dangers miners face.

That extra effort paid off. In fall 2011, the five-member team took first prize in the international 2011 Safety Products Student Design Challenge. Team members were Toni Sabelman, Jamie Bystrom, Sarah Furnae, Alicia Mitchell and Jennifer Whelan. They received an all-expenses paid trip to the Industrial Fabrics Association International Expo in Baltimore, along with $1,500 for the team.

Gindy Neidermyer

A team of five UW-Stout students won an international safety products design competition in 2011. Three members of the team, from left, Jamie Bystrom, Tony Sabelman and Jennifer Whelan, held the jacket portion of the Underground Mine Suit.

The group went through four prototypes, each one an improvement over the first one, as Neidermyer guided them back to the seven-step process each time they needed to re-evaluate.

"There is a lot of technology in fabrics we weren't aware of until this project. It broadened our horizons about what's available," said Bystrom.

"We had binders full of research," Whelan said.

The final product has reflective and glow-in-the-dark materials for visibility; special impact-resistant material, D30, around the knees, shoulders and elbows; drawstrings at the elbows and knees that can become tourniquets to stop bleeding in case of a limb amputation; and lightweight, moisture-wicking material and air vents to keep miners dry and comfortable.

When students finish their projects and the class — the implement and evaluate stages — Neidermyer wants them to know the creative and problem-solving process by heart. It's a skill they can use when designing any type of clothing or solving most any type of problem.

"It's really the process that's creating amazing results in Functional Clothing Design," she said.

The Underground Mine Suit, designed by five UW-Stout students, has reflective and glow-in-the-dark materials, along with other safety features.

Economics of **Compost**

Kyle Mills

Student receives UW System grant to study composting in city

Kyle Mills is digging into the issue of composting in the city of Menomonie.

Mills, a junior majoring in psychology with an economics minor, recently was awarded a UW System student grant for $4,000 through the UW System Solid Waste Research Program.

Ideally, the project "Composting Audit with the City of Menomonie" will be the first step in establishing a citywide composting program that increases the efficiency of local solid waste management. The project should be complete by the end of May.

Mills would like to see a local composting system involving the university, area residents and businesses.

UW-Stout has a program through University Dining Services that involves compostable waste picked up by waste hauler Veolia and trucked to Eau Claire, where it is used as landfill cover. The university is expanding the program to include collecting more food waste, compostable dinnerware, napkins and other items.

Through the audit and study of the present system, Mills hopes to identify an efficient use of the compostable material, one that saves the university money by connecting it to a communitywide program. As part of the audit, Mills is researching factors involved with a composting program, such as composting materials, costs and labor.

Since these factors require analysis, he is approaching the audit from an economic perspective and is using his experience from psychology to assess the composting needs of local businesses, institutions and restaurants.

"Both the school and the city have a demand for a composting program, but it depends on the quality of data and analysis to actually make a positive impact," he said.

Mills is working with George Hayducsko, Dunn County Division of Solid Waste, and Randy Eide, director of Public Works, city of Menomonie.

Mills' research advisers are Sarah Rykal, UW-Stout environmental sustainability coordinator, and Krista James, biology instructor.

The audit is the first step in a long process, Mills said. Other students, led by James, will survey local residents about composting needs to complete a community service requirement.

Mills learned of the city's underdeveloped composting system and the grant through James' Biology 111 class, Science, Society and the Environment. "I figured this would be a good time to apply my economic and psychological background to real-world issues," he said.

McNair **Scholars**

McNair scholars program, research experiences help students stretch their educational, career goals

Lacey Holzer went to North Dakota to help research glucose intolerance. Diana Witcher traveled to New York to study an internationally known artist and sculptor.

Their research projects during summer 2011 were valuable in themselves, but the students' experiences symbolize something greater: The significant strides Holzer and Witcher have made as undergraduate students.

They had the same goal when they came to campus: Earn their bachelor's degrees and begin their professional careers. Now, having seen new possibilities through research opportunities, they are setting their sights on going to graduate school and becoming researchers and professors themselves someday.

Holzer and Witcher credit their involvement to the McNair scholars program, which is in its third year at UW-Stout. One of the purposes of McNair is to train students to conduct research and prepare them to pursue graduate school.

"It has helped me broaden the view of my career," Witcher said.

"I never thought I would want to go to graduate school before," Holzer said.

Her sister's researcher

Holzer, from Hammond, is a senior majoring in dietetics. She was interested in the glucose intolerance study because her sister, Rachael, 9, has had diabetes for three years.

"Once she was diagnosed, I wanted to do juvenile diabetes research. It's really hard on her. I've seen how it affects our family; I can imagine how it affects other families," Holzer said.

Holzer worked with Susan Raatz, a University of Minnesota professor, at the Grand Forks (N.D.) Human Nutrition Research Center, which is funded by the U.S. Department of Agriculture. They examined glucose intolerance using different variables.

Holzer learned how to collect and analyze data for a study Raatz was conducting. "It was just a good experience overall for me. The scientists are so smart, so amazing and what they're doing is so cool," said Holzer, who plans to pursue her doctorate and do research on juvenile diabetes.

The research experience also opened her eyes to "different fields you can go into that I had no idea existed."

Designing a career

Witcher, from Menomonie, is a junior majoring in art with a graphic design concentration. She researched sculptor and landscape artist Isamu Noguchi, who died in 1988.

She was under the direction of Alex DeArmond, UW-Stout assistant professor in the School of Art and Design.

The research experience involved studying Noguchi's landscape and playground works in New York, with the goal of writing an academic paper and adapting it for a mass market publication. Witcher saw several examples of Noguchi's works and visited his New York studio, now a museum.

"He stretched the limits of what is possible as an artist. Studying him inspired me," Witcher said. "He wanted people to understand his art and interact with his sculptures."

Witcher, part owner of Aquarian Gardens, a sustainable flower garden design business in Menomonie, may pursue a doctorate in design and design history.

"It's a new field. There's lots of room for study," said Witcher, who eventually hopes to write, design, consult and possibly teach.

'McNair is changing lives'

Along with Holzer and Witcher, six other UW-Stout McNair scholars — there are 25 in all — conducted research in summer 2011, ranging from on campus with UW-Stout professors to working with professors at Michigan State and UW-Madison.

"When students come back they're completely changed people. They just blossom," said Richard Tafalla, Ph.D., a psychology professor and McNair program director. "McNair is changing lives and really creating some good students."

Money from the grant-funded program pays for research experiences, as well as travel to disseminate research and for site visits to graduate schools. Students in McNair also receive academic support. One of their goals is to have their research published.

"It's no less than a cultural shift. We are saying you can do this, even though they never may have considered it. That's what McNair is about," Tafalla said.

The Ronald E. McNair Postbaccalaureate Achievement Program, a U.S. Department of Education program, began nationally in 1989 to bring more first-generation college students and disadvantaged groups into higher education. It is named after McNair, a scholar and astronaut who died in the 1986 Challenger space shuttle explosion.

For more information, go to www.uwstout.edu/mcnair, or contact Susan McClelland, Research Services.

Closing the **Gap**

Applied Research Center studies how to close the achievement gap in graduation rates

Lacey Holzer

Diana Witcher

Richard Tafalla

In 2011 the Applied Research Center at UW-Stout, with a grant from the UW System, researched four important questions relating to underrepresented minority students.

- How can UW-Stout achieve its growth agenda goal of closing the achievement gap in six-year graduation rates of URM students by 2025?
- What benchmarks and milestones should the university be monitoring to ensure progress is being made toward the goal?
- What are the leading indicators and how can they be measured to ensure the university is on the right track?
- Why do URM students at UW-Stout fall off the path to degree completion?

Underrepresented minority students, or URM, are defined as individuals of African American, American Indian, Southeast Asian, Hispanic or Latino descent or who have a combination of two or more races.

The study, part of the UW System Access to Success Leading Indicators project also involving UW-Milwaukee, UW-Eau Claire and UW-Parkside, was hosted by Education Trust in Washington, D.C.

Jennifer Mans, associate institutional planner at the center, and Jackie Weissenburger, associate vice chancellor, presented the study results at a conference in Washington, in June 2011.

UW-Stout has a goal for six-year graduation rates of URM students to be equal to the rate of all new freshmen — about 60 percent — by the year 2025.

Starting with the fall 2003 freshman cohort, the center studied six-year graduation rates for URM graduates and compared them to non-URM graduates. Campus leaders identified leading indicators in four areas: co-curricular activities, academic success, demographics and level of engagement.

Differences in success rates were measured and statistical relationships were examined between indicators and graduation rates for URM versus non-URM students. Additional statistical analysis was conducted to quantify the impact of the indicators on graduation rates.

The study investigated a total of 19 indicators. Of those, 11 were statistically related to graduation rates. It was found that students who passed economics, political science and math; who stayed after the first year; and who took a capstone course met or exceeded the 2025 URM graduation target.

Therefore, the study revealed that one way to achieve the target is to increase URM enrollment in economics, political science, math and capstone courses and to provide support to help them pass those classes.

Study results have been shared with the Retention Committee, Chancellor's Advisory Council and Strategic Planning Group. The results were also used in developing a fall 2011 university priority to create 250 new jobs for freshmen.

UW-Stout has received a $25,000 grant to continue research in 2012. Leading indicators identified in the initial study as well as existing university performance indicators will be researched.

The center is developing a tracking system to determine participation in several of the leading indicator areas.

With affective research and analysis, the university is answering the questions to keep URM students on the path to graduation.

Applied Research Center

The role of ARC on campus is to conduct institutional research. The center works with faculty, staff and students in survey development and administration, statistical analysis, qualitative analysis and other aspects of research design.

The university issues a Fact Book every year with statistical information. For 2010-11 refer to www.uwstout.edu/parq/upload/factbookcurr.pdf.

128 Bowman Hall
715-232-4098
arc@uwstout.edu
www.uwstout.edu/research/arc

Joongmin Shin

Packaged fresh asparagus had less bacteria and a longer shelf life when treated with x-ray irradiation, according to a study led by Joongmin Shin, a UW-Stout engineering and technology professor. Testing was conducted at Michigan State University.

Package **Deal**

Professor's research offers promise of fresher, safer asparagus

For many people, eating a nutritious stalk of asparagus is a rite of spring. The tender green vegetable is one of the first kinds of local produce to appear in grocery stores each year.

Unfortunately, the asparagus growing season is short. Also, because commercially sold asparagus undergoes very little processing and has a high respiration rate — the speed at which it breaks down — it usually lasts less than a week on store shelves.

What's more, fresh-cut asparagus is susceptible to bacteria because it rapidly loses moisture.

New research led by Joongmin Shin, Ph.D., an assistant professor in the engineering and technology department, could help alleviate those problems.

Shin and three colleagues from Michigan State University found that asparagus exposed to low doses of x-ray irradiation had less bacteria and maintained sugar levels, thereby slowing the respiration rate and extending shelf life, possibly up to 75 percent.

"This is an effective way to control the respiration rate," Shin said. "X-ray treatment will enhance consumer safety by decreasing the number of viable micro-organisms on asparagus." The asparagus treated with x-rays was in a typical consumer package, a vacuum-packed tray covered by breathable plastic film.

Further tests must be done — such as for taste — before the results of the study could be implemented by distributors, Shin said.

Another hurdle, Shin said, is a lack of widespread public acceptance of irradiation. X-ray irradiation is the newest irradiation technology commercially used for foods; other types are gamma ray and electron beam irradiation.

Irradiation is approved by the Food and Drug Administration, and the Center for Disease Control calls it "safe and effective." No radioactive substances are used. Some consumers and consumer groups, however, have concerns about the safety of irradiated food.

Testing for the study was conducted at Michigan State in East Lansing, Mich. Shin's co-researchers were MSU professors Bruce Harte, Janice Harte and Kirk Dolan. The study was published in HortScience, a journal for the American Society for Horticultural Science.

Michigan is one of the leading producers of asparagus. Imported asparagus, because of distribution time, would benefit the most from extended shelf life. Asparagus from Peru was used in the study; it had bacteria many times higher than U.S. asparagus but still was safe to eat.

Shin, in his second year at UW-Stout, earned his Ph.D. at Michigan State and previously was involved in a postdoctoral asparagus study there. He teaches courses in UW-Stout's packaging program, including a class on food packaging.

In the Lab **Training**

Marshfield Clinic internship offers intense hands-on experience

Two senior applied science majors, Martha Fagan and Kelsey Posta, are accustomed to hands-on learning at Jarvis Hall Science Wing. “I really enjoy working in the labs at Stout,” said Fagan. “Professors give you a lot of freedom, and you can even design your own experiments.”

During the 2011-12 academic year, the two are experiencing hands-on education at an even higher level. Fagan and Posta are in a 50-week, lab-based histology internship at Marshfield Clinic and St. Joseph’s Hospital in Marshfield. Histology is the process by which medical technicians prepare human or animal tissue for testing in a pathology lab.

They work side by side with lab professionals and doctors at the two distinguished medical facilities in central Wisconsin.

Earlier in 2011, UW-Stout and Marshfield Clinic-St. Joseph’s signed a Student Training Agreement. Fagan and Posta were the first from UW-Stout to apply. They were accepted and account for two of the four students in the program, which also draws students from other universities.

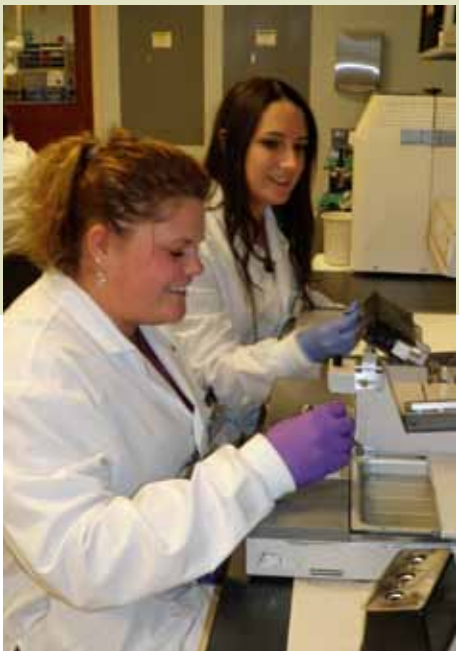
The agreement was coordinated through Charles Bomar, Ph.D., a biology professor and director of the applied science program. The UW-Stout academic advisers are biology faculty James Burritt, Ph.D., cytotechnology, and Maleka “Polly” Hashmi, Ph.D., histotechnology.

UW-Stout students also are eligible to apply for the clinic’s cytotechnology internship. Cytotechnology involves studying cells to help diagnose cancer and other diseases. An example is studying pap smears to help detect cervical cancer in women.

Fagan and Posta spend eight hours a day, 40 hours a week in the lab. They take classes from lab professionals, are tested, observe lab procedures and, over the course of the 50 weeks, learn how to do all aspects of histology.

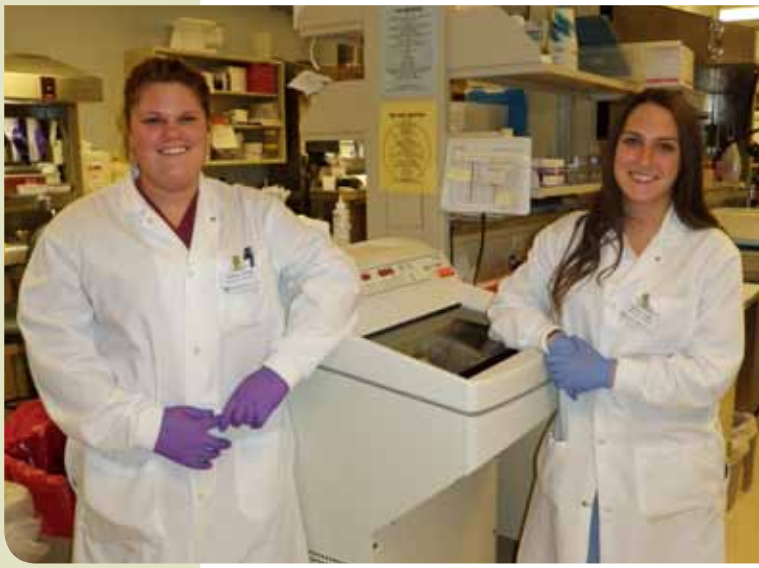
When finished with the program, they are qualified to take the histotechnician board exam. Eventually, after they earn their bachelor’s degrees, they can seek to become histotechnologists.

“It doesn’t get more hands-on than this,” Fagan said. “We’re able to see and touch organs. It’s pretty incredible that I’m in a working histology lab and working with biopsies from actual patients.”



Kelsey Posta, left, and Martha Fagan prepare human tissue for testing in the histology lab at Marshfield Clinic and St. Joseph’s Hospital in Marshfield. As interns, they embed tissue in a metal mold, which is filled with molten paraffin wax. When it cools, the wax-encased tissue is sliced paper-thin, mounted on a slide, stained and then studied by a pathologist.

UW-Stout students Kelsey Posta, left, and Martha Fagan work in the histology lab at Marshfield Clinic and St. Joseph’s Hospital in Marshfield as part of a 50-week internship during the 2011-12 academic year.



When Posta and Fagan work with human tissue, they follow a several-step process: First, the biopsied tissue is embedded in a metal mold, which is filled with molten paraffin wax. When it cools, the wax-encased tissue is sliced paper-thin, mounted on a slide and stained to highlight details. A pathologist then looks for abnormalities in the samples.

Careerwise, Fagan plans to use the internship as a steppingstone to graduate school and to pursue a career as a pathologist or medical researcher. Posta is leaning toward a career in histology.

Students in the program often find work in the medical field as well as at universities, government facilities and private industry.

“It’s been a great experience. You’re always on duty with a histology tech. Everybody is willing to help and answer your questions,” Posta said.

Fagan and Posta will earn 36 credits and then return to UW-Stout to finish their degree programs, if needed, or return to graduate.

The Right **Dynamics**

After prestigious NIH internship, applied science graduate begins career at cutting-edge stem cell company

When Elizabeth Faust enrolled at UW-Stout as a freshman, she was all set on her major. Or so she thought. Shortly after reaching campus, she changed her mind.

"I switched right away to applied science when I realized how great of a program it really is," Faust said.

For Faust, it was the right choice. After graduating in May 2011 and interning that summer at the prestigious National Institutes of Health, she is thrilled with the job she landed and the career she has begun — doing cutting-edge work as a research specialist for Cellular Dynamics International in Madison.

Faust is part of a company that is taking stem cell research and application in a new direction. The issue of using stem cells is controversial because historically they have been harvested from human embryos. CDI, however, transforms cells isolated from blood or skin into embryoniclike stem cells.

"It's really fascinating work. I love it," said Faust.

The cells created by CDI are called induced pluripotent stem (iPS) cells. The process for creating them was discovered about five years ago. While more research is needed before pluripotent stem cells can be used to treat humans, CDI makes and sells them to researchers for modeling diseases and to help pharmaceutical companies make drugs safer, cheaper and faster.

"We're finding a way around the issue of using embryonic stem cells," said Faust. "We manipulate the conditions so we tell the cell what we want it to become, such as a stem cell or neuron."

Her job is to improve the generation of iPS cells from multiple types of tissues to make the technology less invasive for donors and more desirable and accessible to collaborators and other institutions. As part of her job she has isolated cells from blood and worked with the process of growing cells, although she continues to be trained in some aspects of the position, she said.

CDI was co-founded by James Thomson, the UW-Madison School of Medicine professor who is credited with the breakthrough on embryonic stem cells and, later, the pluripotent stem cells discovery.

The company can make the cells from an individual. Eventually, this could be valuable for regenerating tissue in that person or to help prevent rejection in the case of a transplant.

Faust is one of about 100 employees at CDI. Two others also are UW-Stout applied science graduates, both from 2008, Jeff Grinager and Becky Valaske.

For more information on CDI go to www.cellulardynamics.com.

Building for success

Faust is doing what she dreamed of — working in regenerative medicine — but isn't surprised she reached that path so quickly. She could see that dream becoming closer to reality with each year of experience in the applied science program.

For three years, she worked in the Genomics Technology Access Center at UW-Stout led by Michael Pickart, Ph.D., chair of the biology department. She

grew skin cells and did other research in GTAC, which includes tissue culture, genomics and zebra fish labs.

"A lot of the things I do on a daily basis at CDI I've already done at Stout. I already had a basic understanding of everything. I learned a lot at Stout," Faust said.

Faust landed two sought-after internships. Her 2011 spring semester was spent in the lab of UW-Madison Professor Robert Blank doing research on genetic mutations related to congenital vertebral malformations.

Faust's postgraduation NIH internship last summer in Bethesda, Md., was in the lab of Dr. Vincent Hearing doing research on melanoma and skin melanocyte biology using tissue-engineered skin. The NIH, the nation's medical research agency, is part of the U.S. Department of Health and Human Services and is considered one of the world's leading medical research centers.

"Both of my internships solidified all of the lessons I learned at Stout and put them into a real-world perspective," she said, crediting Pickart for helping her land the internships because of his similar research focuses and professional associations.

Pickart saw Faust's potential as a student. "Elizabeth is a rare individual who uniquely combines a drive for excellence while not losing patience with herself and others. I believe this particular trait more than any other has allowed her to excel beyond the capacity of her peers."

Faust is glad she pursued the applied science degree at UW-Stout, Wisconsin's Polytechnic University. The faculty-to-staff ratio is small and she benefited greatly from the lab-based courses and lab access, she said.

Elizabeth Faust, observing in a research lab with Professor Michael Pickart, graduated from UW-Stout in May 2011 with an applied science degree. Pickart is using a biosafety cabinet to demonstrate nonbiohazard liquid and plate handling for maintaining sterility. Faust interned last summer with the National Institutes of Health and does stem cell research for Cellular Dynamics International in Madison.

UW-Stout biology students placed special barrels in Lake Menomin's Wolske Bay as part of a research project to study the bacteria that causes smelly blue-green algae.

Water **World**

Biology students roll out barrels for Lake Menomin experiment

Biology students and faculty rolled out the barrels during summer 2011 to help clean up Lake Menomin, which borders part of campus.

Nine blue barrels, held by a wood frame, were partially submerged in Wolske Bay. Students in a summer section of Biology 101, taught by Scott McGovern, monitored and analyzed cyanobacteria, which causes smelly blue-green algae mats in the lake.

The test barrels contained various concentrations of calcium oxide and sodium percarbonate. Calcium oxide reduces phosphates, the pervasive nutrient that causes algae blooms in the water. Sodium percarbonate kills cyanobacteria. "We're looking for the proper concentrations," said McGovern, who received his Ph.D. in December.

The research project continued into the fall with another group of students. If final results are promising, the experiment could be tried on a larger scale in the lake in the future.

"It's a pilot experiment. These two methods, combined, have never been used in Wisconsin. In 2012, if the experiment is funded by the National Science Foundation, it will include more data collection from 18 barrels," McGovern said.

The project is in cooperation with the city of Menomonie, Department of Natural Resources and Professor Steve Nold, Ph.D., who has studied blue-green algae with students in lakes Tainter and Menomin for several years.

"Like most complex issues, the cyanobacteria situation in Lake Menomin did not occur overnight. Reversing the environmental issues will take time too. These experiments support an evidence-based direction for remediation," McGovern said.

The class used World Health Organization methods of counting cyanobacteria cells and measuring phosphates, McGovern said.

The barrels were donated by PolyGuard of Menomonie.

Stacking **Up**

Rachel Wisth

Packaging students do their research, take third in world competition

"How to Succeed in Packaging in Six Steps," isn't a book or a video, but maybe it should be based on the success of a group of UW-Stout students in 2011.

The four students, all packaging majors, made up one of several teams in the Packaging Development class taught in spring 2011 by Assistant Professor Robert Meisner. Their goal: To develop a new product package.

They created Contact Stack, which takes contact lense packaging in a new direction — vertical. A slim tube holds seven pair of contacts. Each pair is in an hourglass-shaped container that slides into the tube.

In December, Contact Stack took an impressive third place in the WorldStar Student International Packaging Design Competition, sponsored by the World Packaging Organization. The awards were presented in Beijing, China, although none of the team members could attend. Teams from China and South Africa took first and second, respectively. The contest drew 156 entries from 15 countries.

How did the UW-Stout students do it? One step at a time. The design process involved:

- Researching products on the market
- Conducting consumer surveys
- Testing materials
- Researching recyclability and sustainability
- Creating graphics and point-of-purchase displays
- Creating 3D computer models and prototypes

One goal of the team was to make travel easy with a supply of contacts. Traditionally, lenses come in small boxes and are stored side by side in pairs. Features of the new tube design include:

- Space for seven pairs and solution, everything a lens-wearer needs for a week.
- A 7 inch tube, small enough to fit in a pocket or purse.
- A package that conforms to U.S. travel guidelines as an airplane carry-on item.
- A tube made from recyclable materials.

The team members all have graduated and are employed. Matt Sampson, of Centuria, is at Tilsner Carton in St. Paul; Kevin Byrne, of Eau Claire, is at Haworth in Holland, Mich.; Beth Mitchell, of Clintonville, is at J.M. Smucker in Orrville, Ohio; and Rachel Wisth, of Rubicon, is at PolyFirst Packaging in Hartford.

"Our package design awakens a category that hasn't been touched in a while. We focused on making a product/package that combines all of the needed contact supplies (lens, case, solution) into a travel-friendly unit. It's perfect for on-the-go situations," Wisth said.

"This gives us a renewed confidence in ourselves and our abilities as packaging engineers and solidifies that hard work really does pay off," Wisth said.

Meisner said the design succeeded "because it has such far-reaching implications for a huge portion of the population. A lot of people wear contact lenses," Meisner said.

Another UW-Stout team, Project Saucy, took 15th place in the WorldStar competition and earned a Certificate of Recognition with a redesign of the traditional pizza box.

In the spring, Project Saucy won the student category of the Institute of Packaging Professionals AmeriStar competition, considered North America's most prestigious packaging contest. Contact Stack received an honorable mention in that contest.

UW-Stout had two of the top three U.S. entries in WorldStar. This is the first year UW-Stout teams have entered WorldStar, Meisner said.

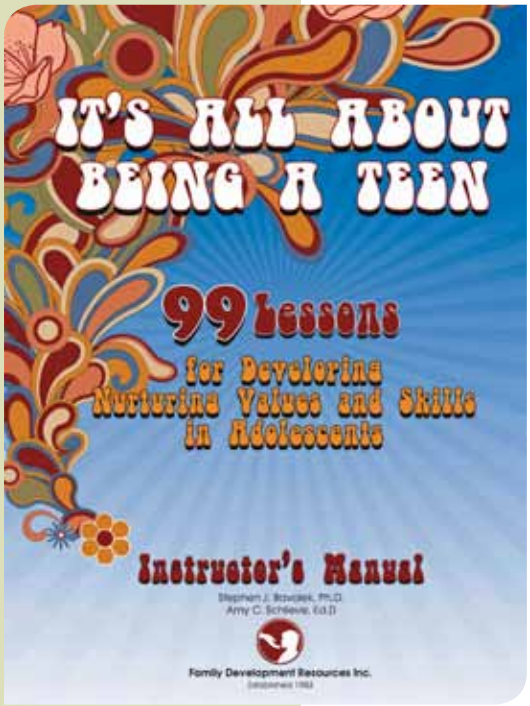
A team of UW-Stout students took third place out of 156 entries in the WorldStar packaging competition. The design, Contact Stack, is a slim vertical tube that holds a week's supply of contact lenses and solution.

Expertise on **Adolescence**

Education professor co-authors guide to teaching teenagers

Some experts believe a person's course in life is determined by his or her early childhood years.

Amy Schlieve, Ph.D., a School of Education professor and special education program director, thinks otherwise. "Teenagers' brains have as much capability to learn new concepts as when they're toddlers," said Schlieve.



Schlieve and Stephen Bavolek have written "It's All About Being a Teen: 99 Lessons for Developing Nurturing Values and Skills in Adolescents," a resource for health teachers, specialists and others who work with teenagers. The publication came out in fall 2011.

Before becoming a university professor, Schlieve taught prekindergarten through high school special education classes and worked with students with learning and emotional problems. She has witnessed the capacity for change in the teenage years. "It's one of the reasons I wrote this," she said.

Yet, the 99 lessons aren't just for "children we would consider at risk or troubled but teens in general. We want to build skills, awareness and healthier lives in all teenagers," Schlieve said.

Schlieve and Bavolek each have more than 30 years of experience in the field. That experience is put to good use in the curriculum they've published, but "It's All About Being a Teen" is based on research by Bavolek's company, NurturingParenting of Park City, Utah.

Each lesson, or construct, is data-driven and was field-tested with social workers, Schlieve said. "When you can write something based on research it's far superior to writing something on your own," she said.

Schlieve did most of the writing and Bavolek the editing. Bavolek was Schlieve's master's thesis adviser at UW-Eau Claire before he left to start his research, company. Schlieve also taught at UW-Eau Claire before joining UW-Stout in 1998.

"Because I'm an educator myself, I wrote it like I would use it in the classroom," Schlieve said.

The lessons are in 15 competency areas, such as understanding how the teen brain functions; increasing self-awareness; what it means to be a family; sex and sexuality; understanding risky behaviors; love and dating; and handling peer pressure.

"The lessons are designed to empower teens to develop healthy lifestyles for success," Bavolek said. "Success in this context is defined as the ability to make positive choices; to break the cycle of dysfunction that has engulfed them; to develop a positive self-identity; and to select peers that are on the same positive path."

Schlieve and Bavolek also co-authored a K-12 curriculum in the 1990s.

"It's All About Being a Teen" is available at www.nurturingparenting.com.

Amy Schlieve, special education undergraduate program director at UW-Stout, is the co-author of "It's All About Being a Teen," a new guide for educators and others who work with teens.

Amy Schlieve

> ***We want to foster the relationships between faculty and students as an important part of the research process. – Judy Hopp, Student Research Fund Committee***

Judy Hopp

By **Committee**

Faculty group revamps student research grant program

Judy "Jo" Hopp remembers when she received a research grant as an undergraduate student. "I felt empowered," said Hopp, Ph.D., an assistant professor of physics.

She would like undergraduate and graduate students at UW-Stout to feel the same way. It's one of the reasons she and three other faculty members met throughout 2010-11 to revamp the process by which students apply for and receive the Student Research Fund Grant.

Along with Hopp, the Student Research Fund Committee includes Sarah Wood, Ph.D., an assistant professor of psychology; Xuedong "David" Ding, Ph.D., an assistant professor of operations and management; and Joleen Hanson, Ph.D., an assistant professor in English and philosophy.

The committee made several significant changes to make the grants more competitive and raise the profile of the program on campus. "We have a strong interest in making this a prestigious award," Hopp said.

"We realized we needed more consistency with the grant applications so we can evaluate them more objectively and comparatively. We want to be more specific in our expectations, just like the professional world."

Some of the changes are:

- Deadlines for applications with single spring, summer and fall dates, along with the possibility of Just in Time grants if funding is available after the deadlines
- A requirement that a faculty adviser sign off on the application via a checklist
- The option to interview a grant applicant and faculty adviser

The grant program is administered through the university's Research Services Office. The office also coordinates the Journal of Student Research, campus Research Day and awards and participation in the National Conference for Undergraduate Research, Posters in the Rotunda and UW System Symposium for Undergraduate Research and Creative Activity.

The Student Research Fund Committee was focused on raising expectations for faculty involvement.

"We want to foster the relationships between faculty and students as an important part of the research process," Hopp said. "We're bringing it to the forefront by including the adviser more explicitly in the process. This is how we're fulfilling our mission at UW-Stout, by engaging faculty."

Involving faculty more fully also should help achieve another committee goal of encouraging students who are new to research to apply for the grants.

The Student Research Fund has $31,000 this year through the Student Access to Learning fee. Students can receive up to $2,000 for a research grant and up to $1,000 for a dissemination — such as travel — grant to help them present their research at a conference or submit to a journal. Faculty can apply for a similar dissemination grant through the Professional Development Fund.

Hopp encourages students to submit early to allow time to fix any application errors or problems. The committee has seen two main issues. Often, there is "very little justification of the budget" for the research project costs. Also, written proposals are difficult to understand for those not in that field. "Writing the grant is a teaching tool. Students can learn that process as well — that professionalism," Hopp said.

Students who receive research grants are expected to submit their finished work for consideration by the Student Research Journal, must present a poster on Research Day and submit a final report to the grant committee.

For more information, go to www.uwstout.edu/rs/student_opp.cfm or contact Susan McClelland in Research Services at 715-232-2694, mcclellands@uwstout.edu.

2011 Scholarly **Activity**

**UW-Stout faculty, staff in bold*

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Furst-Bowe, Julie, provost, Systems Thinking: Critical to Quality Improvement in Higher Education, *Quality Approaches in Higher Education*, 2(2), December; asq.org/edu/2011/12/best-practices/quality-approaches-in-higher-education-vol-2-no-2.pdf.

Center for Applied Ethics
Buchanan, Elizabeth, Internet Research Ethics: Past, Present, Future. *The Blackwell Handbook of Internet Studies*, Oxford: Wiley-Blackwell, 83-108.

College of Arts, Humanities and Social Sciences

PRESENTATIONS

Jones, Glenda; Sweat, Jeffrey; Wolfgram, Susan, CEHHS; **Han, Suejung,** CEHHS, High Impact Practice as Transformative Pedagogy. *International Scholarship of Teaching and Learning Conference:* Transforming the Academy through Theory and Practice of SOTL; October, Milwaukee.

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Kapus, Jerry, Realism, Deflationism, and Success. Proceedings of the Twenty Second World Congress of Philosophy, vol. 15, pp. 75-81, *Korean Philosophical Association and Philosophy Documentation Center.*

Navarre, Joan, The Moon as Symbol in Salomé: Oscar Wilde's Invocation of the Triple White Goddess. *Refiguring Oscar Wilde's Salomé*. Michael Y. Bennett (Ed.) Amsterdam/New York: Rodopi.

Navarre, Joan, Oscar Wilde, Edward Heron-Allen, and the Palmistry Craze of the 1880s. *English Literature in Transition, 1880-1920*. 54(2) University of North Carolina at Greensboro: ELT Press.

Ruiz-Tresgallo, Silvia. The Devil Within: Misogyny and Abjection in El Carnero by Juan Rodríguez Freyle. Panel title: Literary Criticism at the fourth annual *International Conference on Literature, Languages, and Linguistics*, July, Athens, Greece.

Ruiz-Tresgallo, Silvia. Doña Bárbara by Rómulo Gallegos: Female Monsters, Male Fears. Panel Title: Representations of Gender and Sexuality. 64th Annual *Kentucky Foreign Language Conference*. Lexington, Ken., July.

CREATIVE WORKS AND PERFORMANCES

Beck, Dave. Exhibit "Continuation" reviewed in *Sculpture*, September, www.sculpture.org/. Also on exhibit at Roland Gibson Gallery, State University of New York.

College of Education, Health and Human Sciences

PRESENTATIONS

Han, Suejung; Wolfgram, Susan; Jones, Glenda, CAHSS; **Sweat, Jeffrey,** CAHSS, High impact practice as transformative pedagogy. *International Scholarship of Teaching and Learning Conference:* Transforming the Academy through Theory and Practice of SOTL; October, Milwaukee.

Brand, Ann; Mathieson, L. C.; Klimes-Dougan, B.; Crick, N. R.; Hastings, P. D.; Simard, M. R.; Zahn-Waxler, C., The Link Between Relational Victimization by Friends And Internalizing Problems: Does Rumination Play a Role? Also, Helpful or Harmful? How Are Friendship Processes Associated with Internalizing Problems in Adolescence? Biennial meeting of the *Society for Research in Child Development*, Chair Mathieson, L. C., April, Montreal, Quebec, Canada.

College of Management

PRESENTATIONS

Murray, Nancy, Merging Theory and Practice of Online Discussions. *Canada's Association for Co-operative Education Conference*, May, Victoria, British Columbia, Canada.

PUBLICATIONS

Olson, Diane, Growth Chart, Measure your Six Sigma Programs Maturity and Find Areas to Improve. *ASQs Quality Progress Journal,* October.

College of Science, Technology, Engineering and Mathematics

PRESENTATIONS

Hashmi, Maleka; Grant, Jennifer; Little, Amanda, Interdisciplinary Lesson Study: Plants, Drugs, and Depression. *UW System Presidents Summit*, Madison.

Grant, Jennifer, Undergraduate Research in Mass Spectrometry. Conference workshop lead chair, *The American Society for Mass Spectrometry*.

Little, Amanda; Lee, Lucas student; **Yang, Blia** student; Can Rye Cover Crops Limit Alliaria Petiolata and Promote Prairie Restoration in Western Wisconsin? *Natural Areas Association Conference*, Tallahassee, Fla.

Little, Amanda; Jones, Travis student; Tree Community Succession in an Isolated Western Wisconsin Preserve. *Natural Areas Association Conference*, Tallahassee, Fla.

Little, Amanda; Pulfer, Jacob student; **Jones, Travis** student; A First Student Pilot Chapter of the NAA at the University of Wisconsin-Stout. N*atural Areas Association Conference*, Tallahassee, Fla.

Little, Amanda; Grace, J.B.; Schoolmaster Jr., D.R.; Guntenspergen, G.R.; Schweiger, E.W.; Mitchell, B.R.; Miller, K.; Cooper, D.J., Causal Networks as Interpretive Structures for Multi-Metric Indices of Ecological Integrity. *Ecological Society of America,* Austin, Texas.

Little, Amanda, Student Academic Development and Gains in a Loosely-Structured Service-Learning Project: A Tale of Two Sections. *International Society for SoTL*, Milwaukee.

Little, Amanda; Hashmi, Maleka; Grant, Jennifer, Interdisciplinary Lesson Study: Using Case Studies to Build Graph Interpretation And Web Evaluation Skills, and Student Enthusiasm. *International Society for SoTL*, Milwaukee.

Rhee, Jongeun, Design Piracy: Undergraduate Students Ethical Ideologies, Assessment, and Future Intention. A*merican Collegiate Retailing Association* annual meeting, Boston, Mass.

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Anderson, Jeff; Deng, K.; and Dong, Z. Global Solvability for the Heat Equation with Boundary Flux Governed By Nonlinear Memory. *Quarterly of Applied Mathematics*, 69(4), 759-770.

Asthana, Rajiv; Matsunaga, T.; Lin, H.T.; Ishikawa, T.; Kajii, S.; Singh, M. Microstructure and Mechanical Properties of Joints in Sintered Sic Fiber-Bonded Ceramics. *Key Engineering Materials,* 484, 9-14.

Asthana, Rajiv; Singh, M.; Ohji, T.; Mathur, S. Ceramic Integration Across Length Scales: Technical Issues, Challenges and Opportunities. *Ceramic Integration and Joining Technology*, Eds. M. Singh et al, Wiley, 3-14.

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Scholarly **Activity**

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Asthana, Rajiv; Singh, M. Integration of C/C Composite to Metallic Systems for Thermal Management Applications. *Ceramic Integration and Joining Technology*, M. Singh, T. Ohji, R. Asthana and S. Mathur (Eds.) Wiley, 163-191.

Asthana, Rajiv; Singh, M.; Gyekenyesi, A.L.; Smith, C. E. Active Metal Brazing of Titanium to Graphitic Foams for Thermal Management Applications. *International Journal of Applied Ceramic Technology*, November.

Asthana, Rajiv; Singh, M.; Martínez, M. J.; Fernández, J.; Rico, R., Interfacial Characterization of Silicon Nitride/Silicon Nitride Joints Brazed Using Cu-base Active Metal Interlayers. *Ceramics International,* November.

Asthana, Rajiv; Lin, K.-L.; Singh, M., Interfacial Characterization of YSZ-to-Steel Joints with Ag-Cu-Pd Interlayers for Solid Oxide Fuel Cell Applications. *Ceramics International,* November.

Asthana, Rajiv; Sobczak, N.; Sobczak, J.; Purgert, R., The Mystery of Molten Metal, China Foundry, Nov. 2010, 425-437; 2011 winner of the 13th FOSECO Cup Gold Award for best paper, *Foundry Institution of Chinese Mechanical Engineering Society*.

Asthana, Rajiv; *Ceramic Integration and Joining Technology*. Singh, M.; Ohji, T.; Asthana, R. and Mathur, S. (Eds.) John Wiley and Sons, 816.

Little, Amanda; Hoel, Anne, Interdisciplinary Team Teaching: An Effective Method to Transform Student Attitudes. *Journal of Effective Teaching* 11(1): 36-44. uncw.edu/cte/et/articles/Vol11_1/index.htm

Patterson, Marlann, Laser-assisted Atom Probe Tomography Investigation of Magnetic FePt Nanoclusters: First Experiments. Journal of Alloys and Compounds, an *Interdisciplinary Journal of Materials Science and Solid–State Chemistry and Physics*. dx.doi.org/10.1016/j.jallcom.2011.11.134.

Rhee, Jongeun; Johnson, K. K.P.; Lee, J. Y. *The Wardrobe Diet: Teaching Sustainable Consumption Practices Through Experience.* Also presented at Proceedings of the International Textile and Apparel Association annual meeting.

Opportunity to **Help**

Jeanette Kersten

Graduate students in training and human resource development conduct surveys to help nonprofit organization

Graduate students in Jeanette Kersten's Organization Development course at UW-Stout had an opportunity to help a nonprofit association, earn credit at the same time and learn about women in the trucking industry.

Starting in fall 2010 and continuing in the spring and fall 2011 terms, Kersten's students took on semesterlong projects to conduct research for the Women in Trucking Association in order for the organization to better understand the needs of its members.

In the spring term, students surveyed members on the types of ads used in the trucking industry to recruit women drivers. The purpose of the survey was to gather information and feedback from members about the specific messages of recruitment ads combined with current research on marketing for the industry.

As a result of this project, a student in the program has chosen the topic for a thesis project.

In fall 2011, students developed an online survey to which 139 drivers responded. Sixty-five percent of the drivers had joined the organization in the past two years and 88 percent were female. Eleven male drivers, also members of the association, completed the survey. The average age of the respondent was between 50 and 59 years old.

The survey included questions on drivers' economic conditions and benefits they would like to see included for members. A portion of the survey was dedicated to the annual Salute to Women Behind the Wheel event held in March to recognize and honor women drivers.

Kersten, Ed.D., is an assistant professor and director of the training and human resource development Master of Science program. The program, in the College of Management, has been offered since 1995. Students pursuing the degree take coursework specific to training, organization development, adult learning and human resource development.

In the Organization Development course, Kersten teaches the steps of mastering the organization development process while working with real clients.

During the spring 2012 term, students are working with WIT on a project focused on driver safety and women truck drivers, on developing training guidelines and a manual on best practices for recruiting women truck drivers.

Other organizations Kersten and her students have worked with include Mensa of Wisconsin, Refuge Farms of Spring Valley, WestCap of Glenwood City, McKinley Charter School of Eau Claire and a Fortune 500 company.

The needs and expectations of the clients she finds for her students to work with must fit with the course expectations and with current competency research in organization development, she said.