The Periodic Review

Celebration of Leadership
SwISTEM Initiative recognized for regional impact

The Southwestern Indiana STEM (SwISTEM) Initiative has received the Regional Impact Award in the annual Celebration of Leadership program sponsored by Leadership Evansville.

The Regional Impact Award honors an individual or organization with a sense of stewardship of the community and its resources. Linda E. White, president and chief executive officer of Deaconess Health System, presented the award in March during the Celebration of Leadership program. She said recipients act as trustees of the entire region, making conscious decisions through clarity of purpose and a wide span of awareness to seek and work for the common good.

USI was selected in 2007 as the lead institution in southwest Indiana for the Indiana STEM (Science, Technology, Engineering, and Mathematics) Resource Network. The SwISTEM Resource Center serves 11 counties in the region and encourages students to consider careers in STEM fields. Serving as a professional development resource for teachers, it shares best practices with teachers through regular communications and hands-on workshops.

Dr. Scott A. Gordon, dean of the Pott College, said the SwISTEM Resource Center has developed into the regional leader in STEM education. “Since the founding of SwISTEM, we have worked directly with more than 400 teachers and impacted more than 40,000 students in our region. With 24 summer 2010 workshops for teachers, the inaugural GO (Girls Only) STEM! Camp this summer, and our partnership with Naval Surface Warfare Center-Crane, our impact will only expand,” he said.

The GO STEM! Camp will provide hands-on learning for 48 high-school sophomores. The program encourages girls to consider careers in STEM fields. USI and Crane announced a strengthened partnership in February. For more information on summer teacher workshops, including two at Crane, see page 5.

Biochemistry degree program prepares graduates for high-wage jobs in high-tech career fields

A bachelor’s degree program in biochemistry is now available. The new program was approved in December by the Indiana Commission for Higher Education.

One of the first students to declare biochemistry as a major is Mandy Ford. She already holds a degree in business and works in the area of global procurement at Mead Johnson Nutrition Company.

She said she chose the biochemistry program because it involves the specific study of the chemistry of living systems with reference to carbohydrates, proteins, lipids, and nucleic acids.

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Letter from the Dean

This was another year of significant achievement for the Pott College. With more than 1,100 students majoring in our programs and another strong recruitment class expected, we will be bursting at the seams come fall. This is a good problem!

Our Department of Engineering will soon be moving into the new Business and Engineering Center. This move will increase teaching and laboratory space and foster interactions in new design and work centers.

Summer 2010 will see another cohort of students in the college’s Early Undergraduate Research Program. Also, the Southwest Indiana STEM Resource Center staff and several faculty will conduct more than 20 workshops enrolling over 300 K-12 STEM teachers. Increasing enrollments and tremendous reviews of these workshops have solidified the college as the regional leader in science and math education and professional development. Our leadership role has not gone unrecognized. The Pott College and SwISTEM Resource Center recently won the prestigious Regional Impact Award from Leadership Evansville and have been selected by the Indiana Department of Education to lead southwest Indiana in the Indiana Science Reform Initiative.

Dr. Scott A. Gordon
Scott A. Gordon, Dean
Pott College of Science and Engineering

19 selected for Early Undergraduate Research Program

Nineteen students majoring in science, technology, engineering, and mathematics (STEM) fields have been selected for the second class of the Early Undergraduate Research Program, funded by a portion of a grant from the National Science Foundation. All students are completing their freshman year. They will pursue research this summer with a faculty mentor, continue the relationship during the academic year, and participate in another eight-week summer program in 2011. Students receive a $3,000 stipend for each summer and room at board in USI housing. Seventeen students from the inaugural class of the program last year return for their second summer of research.

In addition to Pott College students and faculty, participants in the class beginning the program this year include two students and three faculty members from Ivy Tech Community College-Evansville. The following students and faculty mentors will work together:

- Ashley Altheide and Kristen Schmeisser – Carrie Wright, geology
- Jonathan Behrens, Emily Haines, and Lauren Johnson – Dr. James Bandoli, biology
- Katelyn Cordell – Dr. Priya Hewavitharanage, chemistry
- Preston Edge and Logan Schmitt – Dr. Adrian Gentle, mathematics
- Susan Ellsperman, Ann Libbert, and Luke Maurer – Dr. Eric McCloud and Inna Estep (Ivy Tech), biology
- Patrick Elpers – Dr. Brandon Field, engineering
- Heather Mays (Ivy Tech) and Joseph Price – Dr. Ron Diersing and Dennis Liechty (Ivy Tech), engineering
- Christopher Miller (Ivy Tech) and Brett Williams – Dr. Jeannie Collins and Tamara Barnett (Ivy Tech), chemistry
- Aileen Schwartz – Dr. Ken Walsh, chemistry
- Kurt Virgin – Dr. John Donnelly, mathematics
- Richard Witzke – Dr. Mamunur Rashid, engineering

The program is designed to engage students in hands-on research early in their undergraduate program. Participants will hear a number of guest speakers and take field trips to area STEM industries. Students and faculty members will meet for a weekly seminar where students will give brief updates on the work accomplished and next steps in their research experience.

Students present research at meetings in Mexico, California

Two students in the inaugural class of the Early Undergraduate Research Program attended professional meetings this spring to present research.

Joseph Vangampler presented findings on the topic “Decision Support Systems for Small Wind Farm Owners” at the 2010 annual conference of the Latin America Wind Energy Association. The meeting was held in April in Huatulco, Mexico. Vangampler’s mentor is Dr. Marco A. Lara Gracia, assistant professor of engineering. Vangampler researched the small wind industry worldwide to develop a computer-based information system that facilitates decision making by providing advice to farmers and small communities on fundamental design and operational aspects of small wind energy collection systems.

Prince Nzeata presented his research, “Synthesis of new E-BODIPY compounds bearing Nonyl groups” at the spring 2010 National Meeting and Exposition of the American Chemical Society. He pursues research under the direction of Dr. Priya Hewavitharanage, assistant professor of chemistry. The project involves making new fluorescent molecules that have potential applications in the biomedical and electronic industries. Nzeata received an Endeavor Presentation Award, a travel grant to present research and creative works, to attend the March meeting in San Francisco. Endeavor awards are administered by the USI Office of Academic Affairs.

The Early Undergraduate Research Program began last summer. Students in the first class will continue to pursue research with their faculty mentors for another eight weeks this summer.
"Biochemistry" continued from page 1

“My career goal is to work in research and development focusing on genetics and its relation to pre-diabetes. After graduating from the biochemistry program, I will be prepared for immediate work as a laboratory technician or research assistant,” she said.

The interdisciplinary program will provide a strong combination of chemistry and biology experiences to prepare students for scientific careers in industries such as biotechnology, pharmacology, and environmental chemistry and for graduate study or professional schools in medicine, pharmacy, and related fields. With advancing knowledge, biochemistry has become a major field of science offering expanded employment opportunities.

Students will gain valuable skills and experiences for a wide range of high-skill and high-wage careers that exist in the state and region. A recent analysis indicates that high school students taking the Preliminary SAT exam list biology and chemistry as their top two intended majors.

The new degree program offers two course plans. One focuses more on chemistry content and meets guidelines specified by the American Chemistry Society. Dr. Jeffrey W. Seyler, chair of the Department of Chemistry and professor of chemistry, said this track is ideally suited for students interested in graduate and industrial biochemistry research programs. The other track is a more symmetrical split between chemistry and biology content. It will appeal to students interested in professional programs such as medical or pharmacy school.

Both tracks include an undergraduate research component.

The Pott College established a concentration in biochemistry five years ago as a foundation for a biochemistry major. Due to the existing courses, the new degree program may have its first graduates as early as spring 2011.

Need was determined by the increased number of students in the biochemistry concentration, inquiries from prospective students, and anticipated increases in employment opportunities.

Natasha Smith named U.S. Air Force Summer Faculty Fellow

Dr. Natasha Smith, assistant professor of engineering, has been selected as a Summer Faculty Fellow at the U.S. Air Force Research Lab in Dayton, Ohio.

During the eight-week program, she will work with Dr. José A. Camberos, assistant to the chief scientists for the Air Vehicles Directorate, and Dr. John Benek, director of the Computational Sciences Center. Her research will be on uncertainty quantification for multidisciplinary analysis and design.

Smith is one of 100 fellows chosen from a field of 253 applicants. The Air Force Summer Faculty Fellowship Program offers hands-on exposure to Air Force research challenges for science and engineering faculty at universities in the United States. Objectives include stimulating professional relationships with participants and scientists at Air Force research facilities, elevating awareness in the academic community of Air Force research interests, and providing participants opportunities to perform meaningful research at Air Force facilities.

Smith said, “As aerospace systems evolve, there exists a heightened priority for improvement in system performance, cost effectiveness, reliability, and safety. These systems can be complex, so design is typically decomposed along disciplines (e.g., structural analysis, aerodynamics, controls, engine design, etc.). To complete system design, coordination or reintegration of the individual disciplinary efforts is required. Within this process, analysis tools are needed to incorporate various types of uncertainties and to assess reliability of the system as a whole. My research will look at developing, refining, and/or applying these tools to facilitate safe and reliable designs.”

Smith wants to involve USI engineering students in reliability-design research through independent study, early undergraduate research, and capstone design projects.

Resources of Department of Chemistry serve Vigo Coal

Facilities and instrumentation in the Department of Chemistry linked the University with the needs of Evansville-based Vigo Coal Company for an applied research project that has yielded information the company can use.

The USI Center for Applied Research brought the company and University resources together in fall 2007. In August 2009, Vigo filed a provisional patent for its unique product that was tested at USI. Dr. Andrew Fenwick, vice president for research and development for Carbo Prill (a Vigo-related company) completed research in Pott College labs. USI chemistry majors Shalonda Newcomb ’08 and Ashley Fullerson ’08 were research assistants.

Dr. Jeffrey W. Seyler, professor of chemistry and chair of the Department of Chemistry, said, “We have equipment that is not used to full capacity for our classroom instruction. This provides an opportunity to partner with local industry and allow them to get a benefit from the instrumentation as well.”

Biology major awarded President’s Medal

Meral El Ramahi, a biology major from Newburgh, Indiana, is the 2010 recipient of the President’s Medal, the highest honor bestowed on a graduating senior.

El Ramahi holds a 4.0 grade-point average. She plans to attend medical school.
Carrie Wright leads organization for geoscience teachers

As president of the Central Section of the National Association of Geoscience Teachers, Carrie L. Wright has a large platform from which to promote the teaching and learning of geology.

Wright, instructor in geology, serves as president for 2009-10 of the Central Section, which includes K-16 geoscience teachers in eight states and parts of Ontario.

Earth sciences have a growing presence on students’ radar screens as a potential avenue for employment. As enrollment increases in earth science courses, she encourages teachers to adapt their teaching strategies. They may need more samples in the lab or more engaging lectures to capture a larger audience.

This summer Wright will lead a workshop on geologic hazards for the Southwest Indiana STEM Resource Center. Slated for July 12-16, the workshop will include a field trip to Mammoth Cave National Park to learn about groundwater contamination. The workshop is designed for teachers of grades 6-12.

“I love working with the teachers,” she said, “especially those who are as excited as I am about learning about the planet.”

Wright organized a symposium on easy-to-incorporate inquiry-based activities for the combined North-Central/South-Central meeting of the Geological Society of America held in April in Branson, Missouri. Her “ice-cream glacier” demonstration always goes over well. She presses vanilla ice cream over crushed cookies, demonstrating how a massive sheet of moving ice erodes the landscape.

“It’s cheap and makes the students happy. They get to eat it,” she said.

Student assists Maria with research to understand volcanic events

Dr. Tony H. Maria, associate professor of geology, received a USI Endeavor Award for Research and Creativity to explore the potential of a new procedure combining scanning electron microscopy with fractal geometry to characterize ash deposits produced by different forms of volcanic activity.

A paid research assistant, geology major Holly Keimig spent a week at Michigan Technological University using a scanning electron microscope to capture images of tiny volcanic particles. In the USI lab, she helps Maria wet sieve samples of the ash and analyze them with software to calculate fractal values.

Keimig presented a poster about the research at the Endeavor Symposium in April and at the North-Central/South-Central spring meeting of the Geological Society of America in Branson, Missouri.

Students involved in Doss’ research for U.S. Forestry Service

Continuing research that he began as a guest scientist with the U.S. Forestry Service in Michigan’s Manistee National Forest, Dr. Paul Doss has involved students in his hydrogeology course in analyzing data from groundwater monitoring wells.

Doss, professor of geology, installed the wells during his sabbatical in late 2008. Students analyzed data downloaded in 2009 to understand the shallow groundwater system and how it relates to an adjacent trout and salmon stream that is important to the area economy. Two students, Weston Ellis and Matt Feller, accompanied Doss to Michigan during spring break to install an additional monitoring well.

Ellis, a junior geology major, said, “In the classroom we were dealing with numbers and data, but to be there on the ground and see how the land lies and where the stream is in relation to the wells gave us a better understanding.”

During a meeting with representatives of the U.S. Forestry Service, Ellis was offered a summer job. He will return to Manistee as a forest technician for three months. The agency has asked Doss to work on a new project related to replacement of a “planted” forest with savannah or prairie habitat that is natural to the area.

Feller presented research results in April at a regional meeting of the Geological Society of America in Branson, Missouri. He will graduate this semester and plans a career in environmental consulting. Other students working on the research include Amy Bleichroth, Brandon Sherfield, and Suleiman Khan.
The first Ohio Valley STEM Educators Conference will be held November 6 in the Science and Education Center at USI.

The conference offers area K-12 teachers in STEM fields a convenient opportunity for professional development. Early registration is available at a cost of $30 before September 17.

The conference is planned around four strands: Bridging STEM Disciplines, Embracing Technology in the Classroom, Data-Driven Learning: Meeting the Standards, Utilizing Resources for Hands-on Learning, and Sharing Best Practices.

Proposals for presentations are due June 1.

College leads Region 1 DOE efforts to reform science curriculum

2010-11 pilot program includes 400 K-6 teachers

The Pott College is partnering with the Indiana Department of Education to bring inquiry-based learning activities in science to K-12 classrooms.

To ensure that students are prepared for jobs in a global, high-tech economy, the Indiana DOE promotes curriculum reform that will improve student achievement in science. Only 60 percent of Indiana K-12 students pass ISTEP and meet the expectations set by the state science standards.

Dr. Scott Gordon, dean of the Pott College said, test results have been flat for several years.

Indiana Academic Standards for Science are undergoing revision. In 2011, school corporations will adopt new science curricular materials. The DOE supports the adoption of inquiry-based learning modules to replace textbooks. Research demonstrates the effectiveness of hands-on activities in improving science achievement. DOE has worked with the Indiana STEM Resource Network to promote reform. USI is taking the lead in Region 1, a 14-county area.

Gordon said a pilot program during the 2010-11 school year will involve 400 teachers, about 20 percent of the K-6 teachers responsible for teaching science in Region 1 schools. Teachers in the pilot will receive free teaching materials and professional development training. The one-week training for teachers in the pilot will be available at four locations in the region during the summer. Additional teachers will be sought for a continuation of the pilot the following year. The program gives teachers an opportunity to become familiar with the inquiry-based modules before the adoption date.

In 2007, Gordon attended the National Leadership Development and Strategic Planning Symposium in Washington, D.C., as a member of the Indiana delegation and has been involved in improving science education in Indiana schools since that time.

Workshops, conference offered

Register now for summer teacher workshops

Online registration is open for summer workshops available through the Southwest Indiana STEM Resource center. Area K-12 teachers of science, technology, engineering, and mathematics can learn how to use cutting-edge technology to incorporate best practices into their curriculum.

Participants will receive stipends or materials to take back to their schools for classroom use.

This summer’s line-up of 24 workshops includes a two-day workshop at Naval Surface Warfare Center-Crane Division for Indiana-licensed teachers of fourth and fifth grades. The workshop will focus on real-world applications involving Indiana academic standards for science and technology found at NSWC-Crane. Overnight accommodations will be provided. Some demonstrations will take place in the evening. A workshop at Crane for high-school teachers will be held again this year.

Workshop enrollment is limited. Visit www.swistem.org for more information and online registration.

Learn and share at Ohio Valley STEM Educators Conference

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Students learn fractions with Hexagon Hustle

Senior Shajuan Lindsey, left, helps second graders at West Terrace Elementary School understand that rhombuses, trapezoids, and triangles are fractional components of hexagons. USI students from math-teaching courses staffed activities at the school’s Family Math Night using manipulatives and other resources from the SwISTEM Resource Center’s equipment-lending trucks. Dr. Doris J. Mohr, assistant professor of mathematics, coordinates math outreach.

www.swistem.org
Kester Phillips completes medical school

Kester Phillips ’02, biology, will graduate in June from Ross University School of Medicine. He will begin a residency program in neurology at State University of New York (SUNY) Downstate University Hospital of Brooklyn.

April Hensley, international research intern

April Hensley ’09, biology, is a research intern with The School for Field Studies, an environmental study-abroad program. During the yearlong experience, she is based at the Center for Coastal Studies, located on Magdalena Bay on the outskirts of a fishing village on the west coast of the Baja peninsula.

Hensley serves as a research assistant to professors and mentor to undergraduate students. The program focuses on conserving marine resources, coastal ecosystems, coastal diversity, and threatened marine turtles. She is developing her own research project under the supervision of the program director. Her study involves the effect of artificial octopus accommodations. Discarded tin cans and other containers serving as homes to octopuses have allowed their number to increase and threaten the abalone, a prized catch for the local fishing industry.

Sara Elpers to attend Cornell Summer Math Institute

Sara Elpers, a mathematics and English major from Evansville, will attend Cornell University’s Summer Math Institute, an eight-week residential program that accepts 12-14 students from universities throughout the country. The program allows students to explore mathematics and prepares them for the rigors of graduate school. It focuses on advanced coursework in analysis and on projects in a research-like setting.

Elpers has demonstrated excellence in mathematics on two recent tests. She achieved a perfect score on the Major Field Test in mathematics. She scored a 9 in the Putnam Competition. More than 4,000 undergraduate students throughout the nation took the test.

Dr. John Donnelly, assistant professor of mathematics, said, “Any positive score is excellent, but a 9 is exceptional.” From 2005-09, Elpers held the Rebecca Nunn Couch Endowed Presidential Scholarship. She will graduate this semester and plans to pursue a doctorate in mathematics.

Trustees approve faculty promotions

The USI Board of Trustees has approved promotion for five Pott College faculty members, effective August 23. Dr. Sangwoo Heo, mathematics, will be promoted from associate professor to professor. Dr. Glen J. Kissel, engineering; Dr. Evan L. Millam, chemistry; Dr. Doris J. Mohr, mathematics, and Dr. R. Brent Summers, biology, received tenure and promotion from assistant professor to associate professor.
Ashish Arshanapalli named Homecoming king
Biology major Ashish Arshanapalli was the 2010 Homecoming king.

His campus involvement includes Pre-Professional Health Club where he serves as vice president. He also served USI as an AMIGO and works as a tutor with Academic Skills. He is involved with College Mentors for Kids and is a member of the South Asian Student Union. His community involvement includes volunteering at the Boys and Girls Club of Evansville and participating in Relay for Life. His career goal is to become a physician, specializing in oncology.

Jackie Bundick, a marketing and French major from Columbus, Indiana, was Homecoming queen. The two students are chosen by student vote, scores from interviews by USI administrators, and individual academic records.

Barnett named Outstanding Academic Advisor
Dr. Jeanne K. Barnett, professor of biology, is among five faculty members throughout the University recognized with Outstanding Academic Advisor Awards for 2010. Barnett has served as a coordinator or advisor of the Presidential Scholars program, the Baccalaureate/Doctor of Medicine program, Sigma Zeta math and science honorary society, the premedicine program, and the Pre-Health Professions Club.

Math students successful on actuarial exams
Students in the actuarial track of the mathematics program have successfully completed examinations administered by the Society of Actuaries.

In January, Heather Morrison passed Exam P (Probability), the first in the series of exams that actuaries must complete to achieve professional status. The national pass rate for the exam was 55 percent. Nathaniel Xanders passed the second actuarial exam, Exam FM/2 (Financial Management), in February. The national pass rate was 38 percent. Dr. Yalcin Sarol, assistant professor of mathematics, is advisor to students in the actuarial track.

Minor in statistics available
A new minor in statistics is designed for students who have completed the calculus sequence and want to strengthen their abilities to interpret and evaluate data. Students considering careers in mathematics, actuarial studies, engineering, finance, marketing, economics, life sciences, physical sciences, and social sciences will enhance their career opportunities with the completion of this minor. Student inquiry and discussions with faculty in several disciplines indicated demand for the program. For more information contact Dr. Kathy V. Rodgers or Dr. Bill G. Wilding in the Department of Mathematics at 812/465-1689.

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Your gift to the Pott College of Science and Engineering strengthens programs and provides support for students and faculty.

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To learn more, visit www.usi.edu/foundation.
Calendar of events

May 10 – July 2
Early Undergraduate Research Program

June 6 – 9
GO STEM! Camp NEW for Girls Only!

July 30 – August 6
Tropical biology field study, Ambergris Cay, Belize
Led by Dr. Brent Summers, assistant professor of biology

November 6
Ohio Valley STEM Educators Conference NEW!
USI Science and Education Center (See page 5.)

Engineering students to compete at Kennedy Space Center

A team of engineering students will compete in the inaugural Lunabotics Mining Competition May 25–28 at Kennedy Space Center in Florida. Tommy Callhoun, Hasan Odeh, Matt Schneider, and Alex Schnautz designed and constructed the lunar regolith excavator robot as a capstone project. The NASA Exploration Systems Mission Directorate sponsors the competition.