Early Undergraduate Research Program

Eighteen students completing their freshman year in the spring will be the first participants in the Early Undergraduate Research Program, one of four components funded by a $1.2 million grant from the National Science Foundation. Students majoring in science, technology, engineering, or mathematics (STEM) at the University of Southern Indiana and Ivy Tech Community College, Southwest, are eligible to apply for the Early Undergraduate Research Program. The STEM majors will work with faculty mentors as research assistants in ongoing research projects. Students will participate in an eight-week summer program in 2009. Students will receive a $3,000 stipend for each summer in addition to room and board in USI campus housing. During the academic year, students may enroll in a research course specific to their major to earn credit hours.

Funds are available from the NSF grant to purchase supplies for research and fund student travel to professional meetings to present research results. USI and Ivy Tech faculty who participate as research leaders will receive a stipend for the summer program.

Dr. Scott A. Gordon, dean of the USI Pott College of Science and Engineering, said the goals of the Early Undergraduate Research Program support the college’s vision of engaging students, promoting a team approach to teaching and learning, creating a more hands-on, nurturing faculty, increasing retention and early exposure to faculty-mentored research.

Continued on page 2
Welcome to the fall 2008 edition of The Periodic Review. The college enrollment continues to grow with another 10 percent increase in freshman majors over last year. In the past three years, the number of students majoring in academic programs offered by our college has grown more than 30 percent. To keep up with this growth we are steadily adding outstanding faculty to the ranks. This fall 12 new faculty members joined an exceptional group of professionals dedicated to providing our students with rich learning experiences.

Last summer we broke ground for the $30 million Business and Engineering Center and completed phase one of a major renovation to the original Science Center. During this year, we will plan for phase two of the renovation and for construction of the new Advanced Manufacturing Center.

Several major grants provide funding for some of the initiatives you will read about in this newsletter. Through these initiatives, we aim not only to attract top students and faculty but to retain that intellectual talent as well.

I hope you find this edition of The Periodic Review both enjoyable and informative.

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

“Research” continued from page 1

graduation rates, and producing highly qualified innovative undergraduate STEM majors.

He said that many students who leave STEM majors cite the lack of hands-on engagement early in their undergraduate careers. Others complete a degree in a STEM discipline but find themselves unprepared upon entering the workforce to connect classroom learning with real-world problem-solving and research.

Dr. Shelly Blunt, associate dean of the Pott College, said each research group will be led by a faculty member and include one or more students, depending on the nature of the research. During the summer program, all faculty and student participants will meet on Fridays for a seminar, providing updates on research progress. Speakers from business and industry will address the students. The program also will include visits to area STEM industries.

The NSF grant will fund the research program for five years.

After completing the Early Undergraduate Research Program, students will be encouraged to apply for Research Experiences for Undergraduates (REUs) available nationwide, continue with their faculty research mentor, or become involved as a research assistant at an area STEM business or industry.

Supporting the college’s vision of producing highly qualified innovative undergraduate STEM majors

Project Lead the Way to hold spring student conference

Grants available for teacher training, equipment purchase

Area middle school and high school students interested in engineering will converge on the University of Southern Indiana campus Friday, April 3, when the Pott College of Science and Engineering hosts the Project Lead the Way (PLTW) Student Conference. The conference will take place from 8:30 a.m. to 1:30 p.m.

Engineers from area industries will make presentations about their careers to help students learn more about the varied opportunities in the fields of engineering. Students and their faculty sponsors also will gather in small groups to participate in hands-on activities related to engineering.

PLTW is a national educational program that began in 1996. Its goal is to help provide middle and high school students the rigorous ground-level education they need to develop strong backgrounds in science and engineering.

David Ellert, USI instructor in engineering and interim director of the Southwest Indiana STEM Resource Center, said the Pott College received funds to promote the expansion and enhancement of Project Lead the Way. The funds, received through a Workforce Innovation and Regional Economic Development (WIRED) Grant, support workforce development in a nine-county region including Dubois, Gibson, Knox, Perry, Pike, Posey, Spencer, Vanderburgh, and Warrick counties. PLTW programming is available this year in 18 high schools and eight middle schools and junior high schools throughout the region.

The WIRED initiative also supports two grant programs to enhance PLTW programs. Teacher training fellowships of $6,500 will be available for teachers to attend the two-week Summer Training Institute at the Purdue University College of Technology, Kokomo. Grants will cover purchase of a laptop, tuition, lunch, lodging, and mileage expenses. Equipment and instrumentation grants of up to $5,000 (with a required matching grant) are available to purchase computer hardware, software, equipment, or instrumentation for pre-engineering courses.

For more information, contact Ellert at 812/464-1883 or djellert@usi.edu.
Pott College lab experiences give middle school students a feel for how scientists work

Helfrich Park students determine the calcium content of a water sample with supervision from Dr. Jeannie Collins, associate professor of chemistry and acting chair of the Department of Chemistry.

Helfrich Park students attend STEM Academy

More than 400 students from Helfrich Park Middle School in Evansville are conducting experiments under the supervision of USI Pott College of Science and Engineering faculty as part of Helfrich Park’s new STEM (science, technology, engineering, mathematics) Academy.

The program brings about 50 students and their teachers to USI once a month for a two-hour lab session. During spring semester, Pott College faculty will lead hands-on lessons on ocean life, microbiology, rock and fossil analysis, and the water stream table. These inquiry-based opportunities are designed to help students understand how scientists work and promote interest in STEM careers.

Tim McIntosh, principal at Helfrich Park, said the partnership with the Pott College gives students an opportunity they could not have on the middle school campus. Many students are visiting a college campus for the first time.

“It’s been extraordinary,” McIntosh said. “The USI professors have been extremely gracious and willing to work with our students.”

New teacher handbooks available for science fair projects

New handbooks are available on the web site of the Pott Foundation Tri-state Science and Engineering Fair that make it easier for teachers to incorporate science fair projects into the curriculum.

The 2009 fair will be held March 12-13 at USI.

Dr. Shelly Blunt, fair co-director, said the handbooks for middle school and high school teachers include a sample time line, teacher checklist, grading suggestions, and information about how projects can support science standards.

A student section of the handbook provides information about project categories, sample abstracts, tips for the project display board, and sample judging questions. A brainstorming grid is available to help students identify their interests and choose a project topic. The web site also includes forms, links to sources for project ideas, and other information.

Blunt said the development of a science project should be an interesting, exciting, and fun experience that enables students to learn science by doing science. The handbooks help dedicated teachers and sponsors contribute to a rewarding experience for the students.

Nora Walsh, chemistry teacher at Reitz High School; Mary Ann Kraft, science teacher at Evansville Day School; and Deborah Vannatter, science coach for the Evansville-Vanderburgh School Corporation, assisted in developing the handbooks.

David Ellert, fair co-director, said awards to be presented at the 2009 fair will include six $1,500 renewable USI scholarships in the senior division, laptop computers for the top winners in both the senior and junior divisions, cash awards, and medallions. Classroom awards also will be presented. Awards totaling more than $40,000 were distributed at the 2008 fair. Individuals or organizations interested in sponsoring awards may contact Blunt.

Two senior division winners will have the opportunity to participate in the Intel International Science and Engineering Fair, May 10-15, in Reno, Nevada. Other top winners will advance to the state competition to be held April 4 in Indianapolis, where they also may compete for a spot in the international competition. In 2008, Stacy Vosters, of North Daviess High School, placed fourth in her category at the international fair in Atlanta, Georgia. She was a senior division grand award winner in the Pott Foundation Tri-state Science and Engineering Fair.

Pott Foundation Tri-state Science and Engineering Fair

March 12-13

For additional information: Dr. Shelly Blunt 812/465-1268 812/464-1883 sblunt@usi.edu djellert@usi.edu

www/usiele/science/fair
Research that began in January 2007 for senior biology major Sarah O’Donoghue led her to spend spring break 2008 in Hawaii collecting samples for continued research and attending a professional meeting.

O’Donoghue is a USI Baccalaureate/Doctor of Medicine recipient. She became a research assistant to Dr. Cindy DeLoney-Marino, assistant professor of biology, after completing a course in microbiology with her.

“She had given a brief overview of what she did for her postdoctoral work and continues to do with research,” O’Donoghue said. “It sounded interesting.”

DeLoney-Marino’s research involves the symbiosis between a marine bacterium and the Hawaiian Bobtail Squid.

“We are looking to see how the organisms form this relationship and what chemical attractants are used to establish this symbiosis,” O’Donoghue said.

She is the 2008 recipient of the Victor H. and Elizabeth A. Barnett Research Award for a science or engineering student pursuing research with a sponsoring faculty member. The award supported O’Donoghue’s research and attendance at the 20th annual Euprymna scolopes-Vibrio fischeri Symbiosis Pow-Wow in March at Coconut Island, Hawaii.

“Hawaii was amazing,” O’Donoghue said. “We collected specimens in the waters of Honolulu before the conference began. (Not surprisingly, the Hawaiian Bobtail Squid lives in the coastal waters of Hawaii.) This was particularly exciting because it was my first time at the ocean.”

O’Donoghue presented a poster at the conference in Hawaii. She also attended the annual meeting of the Indiana Branch of the American Society of Microbiology (IBASM) where she won a first-place award of $150 in the undergraduate division for her presentation. Her paper will be published in an IBASM newsletter. The meeting was held in March at Ball State University. In addition to the Barnett Research Award, O’Donoghue received University RISC (research, innovation, scholarship, creativity) grants to support her research and travel.

DeLoney-Marino said, “Sarah has been a dedicated and conscientious research student and demonstrates an independence more typical of graduate students. She has taken pride and ownership in her research project, and when presenting her results, has done so in a professional and eloquent manner.”

After graduating in the spring, O’Donoghue plans to attend medical school. Her interest is in emergency medicine although she reserves the right to change her mind as her studies progress. O’Donoghue is from Newburgh, Indiana. She is a graduate of the Indiana Academy for Science, Mathematics, and Humanities.

Dr. Joey V. Barnett ’81, creator of the Barnett Research Award, was guest speaker at a recent dinner for B/MD recipients and friends of the University who have established B/MD scholarships. He is vice chair of pharmacology and director of graduate studies in pharmacology at Vanderbilt University Medical Center. His research on heart valve replacement has received funding from a National Institutes of Health program to grow tissues and organs.

Groundbreaking signals rise of Business and Engineering Center

Representatives of the Pott College of Science and Engineering and the College of Business joined together in July to break ground for the Business and Engineering Center, a $29.9 million state-of-the-art facility that will include classrooms, laboratories, faculty offices, and meeting space for the engineering and business programs. From left are Glen J. Kissel and David Ellert, engineering faculty, and Dr. Sang T. Choe, Dr. Brian L. McGuire, Jenny R. Medcraft, and Victoria J. Reed of the College of Business. The center is scheduled to open in 2010.
Twelve join Pott College faculty

The Pott College of Science and Engineering welcomed 12 new faculty members for fall semester.

**Stephanie Bush**, instructor in biology, is a Ph.D. candidate in biology at Columbia University. She has taught as an adjunct faculty member at Columbia, College of New Rochelle, and The Cooper Union.

**Keith Carter**, instructor in mathematics, earned a master’s degree in education this year at the University of Southern Indiana.

**Dr. Matthew Elliott**, assistant professor of physics, earned a doctorate in 2008 from the University of New Mexico. He taught undergraduate classes in thermodynamics and statistical mechanics and was a research assistant at the University of New Mexico for four years.

**Dr. Brandon Field**, assistant professor of engineering, earned a doctorate in mechanical engineering at the University of Illinois at Urbana-Champaign in 2007. He was formerly a research engineer on heat transfer equipment at Creative Thermal Solutions in Urbana.

**Dr. Cynthia Forgie**, assistant professor of engineering, earned a doctorate in industrial engineering at the University of Louisville in 2008. She has taught at the University of Louisville and Kansas State University.

**Dr. Priya Hewavitharanage**, assistant professor of chemistry, earned a doctorate in photochemical sciences at Bowling Green State University. She taught previously at Ball State University.

**Mei Jones**, instructor in mathematics, earned a master’s degree in education at USI, where she has taught University Division courses. She also has taught at Ivy Tech Community College and Henderson Community College.

**Dr. Marco Lara Gracia**, assistant professor of engineering, earned a doctorate in industrial engineering at Purdue University. He has taught courses in operations management, decision analysis, and supply chain management.

**Dr. Edward Rehkopf**, assistant professor of mathematics, completed a doctorate in mathematics at the University of California at Santa Barbara. He has taught at UC-Santa Barbara and Westmont College.

**Janet Sipes**, instructor in mathematics, earned a master’s degree in mathematics at the University of Missouri, where she served as a teaching assistant.

**Dr. Edmir Wade**, assistant professor of chemistry, earned a doctorate in chemistry at the University of Denver. He was formerly a visiting assistant professor at Colorado College.

**Nelda Wade**, instructor in mathematics, earned a master’s degree in mathematics at the University of Denver. She was previously a mathematics instructor at Pueblo Community College.

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First class to be inducted in 2009
Pott College Hall of Fame

Nominations due January 1

The Pott College Hall of Fame will recognize graduates in science, mathematics, and engineering who have demonstrated outstanding achievement in their careers or in service at the local, state, national, or international levels.

Hall of Fame members will be inducted during spring semester at the STEM (science, technology, engineering, and mathematics) dinner. This annual event welcomes administrators and STEM teachers from school corporations in nine counties to campus. Guests learn Pott College STEM initiatives and hear a nationally known speaker.

Be a part of choosing the first class in the Pott College Hall of Fame!
For more information and a nomination form, visit www.usi.edu/science.

Faculty news

**Dr. Paul K. Doss**, associate professor of geology, is spending the fall semester of his year-long sabbatical as guest scientist for the U.S. Forest Service in Manistee National Forest in north-central Michigan. His work relates to the environmental impact of large-scale groundwater withdrawals and the recently enacted Great Lakes Water Compact.

**Dr. Brent Summers**, assistant professor of biology, has been named program director for the USI Baccalaureate/Doctor of Medicine program and co-director for the Presidential Scholar program.
Biology graduate Travis Taylor speaks on national security

Dr. Travis Taylor ’94, biology, presented the Pott College’s alumni-in-residence program on “The Impact of International Health on National Security” during spring semester. He is a science consultant at Gryphon Scientific, a firm providing scientific expertise to government and private clients on issues related to health and homeland security.

Taylor earned a doctorate in virology from Harvard University. As a postdoctoral fellow at Harvard Medical School, he identified host factors involved in herpes simplex virus replication and developed a West Nile virus vaccine. From 2005 to 2007, he was an American Association for the Advancement of Science (AAAS) Science and Technology Policy Fellow, serving as a science advisor for the U.S. Department of Defense Biological Threat Reduction Program.

At USI, Taylor was a Bristol-Myers Squibb Presidential Scholar. He lives in Takoma Park, Maryland.

Rick Hudson assists algebra initiative

Rick Hudson ’02, mathematics, assisted last summer with coordination of a statewide conference in Indianapolis for the Indiana Algebra Readiness Initiative, a program that helps teachers prepare students in grades five through nine for success in algebra. Hudson also recruited members for five regional workshop teams.

Along with Hudson, Dr. Doris Mohr ’87 and Carrie Andersen ’03 of the USI mathematics faculty, Andrea Greaney ’98, and Jane Mahan presented the southwest regional workshop held in July at USI. Hudson is pursuing a doctoral degree in mathematics education at Indiana University.

Student learning experiences extend beyond campus

Katie Funke — from Houston to Ireland

Katie Funke, a junior engineering major from Evansville, spent 10 weeks at Johnson Space Center in Houston, Texas, during the summer as an intern in the National Aeronautics and Space Administration’s Undergraduate Student Research Program. She is studying fall semester at University College Cork in Ireland.

Funke holds the Henry J. and Hazel D. Bennighof Baccalaureate/Doctor of Medicine Scholarship.

Biology students travel to Belize

An eight-day trip to Belize was the high point of a tropical biology course for 10 students last summer after three weeks of academic preparation in the USI classroom.

Dr. Brent Summers, assistant professor of biology, taught the course. During the trip, students visited the barrier reef of Tres Cocos, a marine preserve called Hol Chan, the undersea Mexico Cave, and many other locations. One of their favorite spots was Shark Ray Alley where they swam with nurse sharks and stingrays.

Students kept journals of their experiences. One student wrote, “What we were able to do in the water is something I never thought I could do. I can say I rubbed the belly of a shark and got inked by an octopus! I’m so happy I did this. I proved a lot to myself this week.”

The group stayed at the Belize Marine Tropical Research and Education Center on the island of Ambergris Caye. Summers plans a return visit to Belize with the tropical biology class in summer 2010.
Help strengthen the Pott College of Science and Engineering

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

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Lois Mittino Gray ’94, adjunct instructor in biology, has been named 2007-08 Rural Teacher of the Year by the National Rural Education Association. She was honored in October at the organization’s annual conference in San Antonio, Texas.

Gray is a science teacher at New Harmony Junior/Senior High School in New Harmony, Indiana. She teaches six lab classes, supervises the daily care of 22 assorted lab animals, and teaches a gifted and talented program. She has taught at New Harmony since 1987.

The Rural Teacher of the Year Award is sponsored by the John Deere Co. Gray received a $2,000 honorarium. The school district received $1,000 to buy instructional materials and supplies.

“I am absolutely flattered and honored by the outpouring of community support I have received over this award,” Gray said. “Every time I drive under the banners flying in town announcing my win, it reminds me why I dedicated my heart and soul to this career in a small-town setting. I have some of these students six years in a row, if they take all my electives. I really know and understand them and feel that I can make a difference in their lives.”

College to host Calculus: The Musical!

A nationally touring musical that brings to life the concepts and history of calculus will be performed at 3 p.m. Tuesday, January 13, in Mitchell Auditorium of the Health Professions Center.

Calculus: The Musical! is a two-person show that uses parodies of music from light classical to hip hop to introduce and illuminate such concepts as limits and integration. The comic review is produced this year by Know Theatre of Cincinnati, Ohio, after two years on tour with creators Marc Gutman and Sadie Bowman. Gutman holds a master’s degree in math education. He developed the show after finding that his students at a high school in Minneapolis learned better when formulas and rules were set to music. Bowman is a professional theatre artist. Sarah Stephens and Dan Davidson of Know Theatre will perform the show at USI.

Dr. Kathy V. Rodgers, associate professor of mathematics and chair of the Mathematics Department, said the show with the unlikely, but entertaining, combination of music and calculus principles has consistently sold out and received excellent reviews on other campuses. In 2007-08, the musical was performed approximately 50 times in 13 states and in Canada.

Rodgers said the performance will appeal to USI calculus students and anyone interested in music. Courses in calculus are included in the USI Core Curriculum. Calculus students from area high schools are invited to attend.

The performance is approximately 50 minutes long. There is no charge to attend. Funding is provided by USI STEM (science, technology, engineering, mathematics) initiatives.

Make your tax-deductible check payable to: USI Foundation, 8600 University Blvd., Evansville, IN 47712

☐ Please contact me about an estate gift.

A contribution of $25 or more to any USI Foundation fund makes graduates “active” members of the USI Alumni Association.
A high-altitude balloon launched recently by engineering students studying design and analysis traveled 18 miles to the edge of space before bursting and sending experiment-laden boxes back to Earth. GPS tracking allowed the students to track and recover the boxes. Dr. Glen J. Kissel and Dr. Brandon Field, assistant professors of engineering, taught the class.