

## FY 2017 Awards

Project Director	Michelle Catalano
Title	Collection of documentary films for the instruction of RA 101
Award	\$11192
Abstract	Reasoning & Argumentation 101 is a general education course emphasizing in the analysis, evaluation and construction of arguments. Students from all majors take RA 101; there were 59 face-to-face sections (including 8 New Freshman Seminars) taught during the 2015-2016 academic year. Instruction of RA 101 requires dialogue on a wide array of debatable, contemporary issues. Documentary films are an effective way to fulfill curriculum requirements of RA 101 and they offer numerous points of departure as a method of instruction. A collection of documentary films is needed so that instructors have ready access to it for direct in-class purposes with students and also to use as references for examples of extended arguments. Given the various barriers of obtaining physical copies of documentary films that are also compatible with the campus technology, this DVD collection would greatly enhance the availability of resource materials to instructors of RA 101.

Project Director	Robert D Douglas
Title	Implementing Computer-aided Assessment Technology to Enhance Student Self-assessment and Improve Faculty Grading Calibration
Award	\$20000
Abstract	Virtually every dental school employs some type of pre-clinical simulation in the clinical training of their students. Most schools train their students with dentoforms (plastic teeth and jaws) mounted on poles or in manikins where students practice basic cavity or crown preparation designs on plastic teeth. The acquisition of psychomotor skills is an essential process in preclinical training for dental students. In fixed prosthodontics, the ability to prepare teeth to narrow tolerances can affect the longevity of restorations. These skills are largely acquired through practice and experience in the simulation clinic, yet simulation time is often restricted due to the intensive nature of dental courses and limited school resources. Recently, technological advances have cultivated a new era of software-assisted learning for improving psychomotor skill acquisition during simulation training. These technologies have the potential to maximize students' learning capabilities resulting in better clinical outcomes.  The current application proposes to introduce one such computer-aided learning resource (Sirona's "prepCheck") to the new freshman dental students to:  1. Teach and foster self-assessment to enhance learning,  2. Potentially decrease their learning curve in the pre-clinical environment,  3. Teach and use technology for making digital impressions that our students would later directly apply to a clinical setting,  4. Improve faculty calibration for more standardized feedback and consistent

grading.
Validation of the efficacy of the computer-aided assessment tool will occur
through a study that will evaluate testing outcomes of students who use the
software resource compared to a control group that uses the current
conventional learning techniques. The technology also has the potential for
application in courses that focus on teaching students the anatomy of teeth
whereby they must create replicas of teeth from wax. Furthermore, the
prepCheck could potentially be employed to improve calibration of faculty for
more standardized grading of projects that are traditionally evaluated using
qualitative assessments.

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Project Director	Thoshitha Gamage
Title	Sprinkled Security: Noninvasive Cybersecurity Interventions
Award	\$13580
Abstract	We propose the development of a Sustainability and Diversity Summer Program (SDSP), housed in the Sociology Program. SDSP will offer two Certificate tracks from which students may choose a Sustainability and Social Justice Certificate. Both Certificates will involve an intense study of social justice, but each track will be delivered either through the lens of sustainability or social diversity. Today's undergraduates experience a world that is much more socially diverse but much less sustainable than previous generations. They must be prepared to engage with both individuals and institutions that are diverse and concerned about sustainability. The SDSP has the potential to attract not only current undergraduates but also potential ones. Students will benefit in the short term by receiving a Certificate they can include on their resumes' in advance of receiving a four-year degree. The Certificate may also attract nontraditional students who are looking for a way to advance their already-established careers. The tracks will be designed to allow undergraduates to enroll in one or both tracks simultaneously. The tracks will also be scheduled such that undergraduates from both tracks can be combined into one large group for discussions and other exercises that highlight the overlapping nature of Sustainability and Social Diversity. We anticipate that the SDSP will attract students from a diverse range of academic, personal, and professional interests, as the topics have applicability in all that humans do. EUE funding is requested to support the collaborative development and implementation of curriculum for the two tracks to be offered in Summer 2016 and numbered as SOC 490-002 Special Topics, Diversity and Social Justice . Each track will be taught by its own instructor, but will overlap when appropriate. We also plan to invite guest speakers from relevant offices and organizations to speak to the tracks. Funds are also requested to support one field trip to explore sustainability and diversity in the Metro East.



Project Director	Chaya Gopalan
Title	Development of a Digital Textbook and the Use of Innovative Active Learning
	Strategies to Improve Student Learning Outcomes
Award	\$11192
Abstract	This project focuses on the course redesign to improve student outcomes while creating efficiencies in the delivery of the course content by developing a course-specific digital textbook as well as using innovative student-centered learning strategies such as Flipped Classroom (FC) and Team-Based Learning (TBL). The proposed study tests student performance as a measure of course improvement by introducing the very first digital textbook and the TBL-FC method of teaching for the course titled Biology of Cardiovascular and Metabolic Diseases (KIN 412). The availability of an instructor-produced textbook would be an invaluable resource to a course that is considered by students as the most difficult course in the Exercise Science program. Additionally, these student-centered teaching methods not only engage students in the classroom but also enable them to change their study habits to be better learners and experience overall student success. The FC approach requires students to complete pre-class assignments such as selected readings, pre-recorded lecture videos, PowerPoint slides and an individual assessment over the assigned content for each lecture. In-class activities include a review of the pre-class assignments and a TBL session during which students will be engaged in knowledge application and analysis. The traditional lecture, on the other hand, will be an interactive didactic live podium presentation. Attendance and all assessment grades will be maintained between the two modes of teaching in addition to gathering periodic student surveys to track student improvement. During fall 2016, students will be introduced to the newly constructed textbook for the very first time and the course will be taught in the traditional lecture format. Any minor edits to the newly introduced text will occur prior to assigning the text for the spring semester. In spring 2017, this course will be not only using the updated instructor-developed textbook but also be using the FC approach which is anticipated to improve attenda

Project Director	Christienne L. Hinz
Title	Playing World History
Award	\$5200
Abstract	My project will create the gaming systems, printed materials, game aids, instruction manuals and assessment tools needed for an Introduction to World History course reconfigured as a series of theory-driven simulated role-playing games. This transformation will use blended classroom technology to deliver high quality course content and iterative opportunities for students in large classrooms to take ownership of their educational



experiences through dynamic, creative interaction with course materials and
with one another. The purpose of this course reconfiguration is to improve
student completion rates, cement joy of learning, improve student outcomes,
and thereby contribute to the university's goal of improved student retention.

Project Director	Shunfu Hu
Title	Using Experiential Learning Opportunities in the Virtual National Parks to Enhance Undergraduate Geoscience General Education
Award	\$5940
Abstract	This project proposes to select 10 national parks as 'models' to develop virtual national parks (VNPs) in order to offer students the experiential learning opportunities in undergraduate geoscience general education courses offered by the Department of Geography, namely ESCI111: Introduction to Physical Geology and Physical Geography, Geog210: Physical Geography, and Geog211: Meteorology. Each selected national park represents unique geology, physical geography, and landscapes that have been shaped under the influence of weather and climate. The project director (PI), Professor Shunfu Hu, frequently teaches all these three courses.
	The project will be implemented in four steps. First of all, the project director (PI) will develop an online interactive map using Google Maps API JavaScript to display the locations of the ten selected national parks with clickable icons shown on the map. Each icon will be hyperlinked to the multimedia information about each park, including a 3D fly-through animation of the park, panoramic and close-up digital photographs of the points of interest, and walk-through video clips along trails to provide the students with a sense of real presence in the park. Secondly, the PI will conduct a thorough literature review on the geological history of each park, the rocks and minerals found in the park, the weather and climate in the region, unique landscapes of the park; and more importantly, points of interest (e.g., scenic viewpoints). In addition, the PI will create a set of supporting instructional materials, so students are able to explore the online interactive map and to answer questions. Thirdly, the PI will work closely and iteratively with the other course instructors in the Department of Geography and the students who take any of these classes to collect feedback, and will answer any student concerns about the new activities. The feedback will be immediately integrated into the improvement of the VNPs. And finally, the PI will summarize the findings from this project, and prepare a manuscript for publication in the Journal of Geoscience Education.  It is anticipated that, each year, over 800 undergraduate students, mainly freshmen and sophomores, will be able to use the VNPs as experiential learning opportunities to improve the understanding and retention of key concepts in ESCI111, Geog210 and Geog211. Moreover, the successful completion of the project will have lasting impact on the student learning for years to come.



Project Director	Sarah Luesse
Title	Improving Student Laboratory Experiences via Pre-laboratory Instructional
	Videos
Award	\$6706
Abstract	This project proposes to enrich the educational experiences of our SIUE undergraduates through the preparation of video-based demonstration and instructional videos. Each video will provide an overview of the experiment to be performed, with special emphasis on the safety hazards associated with the chemicals and equipment being used.  As the number of laboratory sections has increased, the number of teaching assistants (TAs) leading lab sections has also increased. This means that we are placing more inexperienced TAs in our CHEM 245 labs. As more laboratory sections have opened, it is increasingly difficult to ensure consistency of experiences for our undergraduates and guarantee that safety information and course concepts are relayed effectively to our students by their TAs. The quality of hands-on laboratory experiences is often closely correlated with the quality of the teaching assistant leading the course. Undergraduates will benefit from video supplements, which will provide the same pre-laboratory instruction to all enrolled students. A survey of students understanding of safety information, chemical hazards, laboratory techniques, and use of instrumentation will provide measurable outcomes for the improvements in student learning that we anticipate.  All videos will be correlated to a specific laboratory experiment and used in any future term that includes that experiment. Therefore, this project will provide sustainable improvement to the hands-on laboratory experiences and preparation of our science undergraduates by the development of video-based pre-laboratory lectures. These videos will be used any semester in which the corresponding experiment is scheduled, benefiting future majors and minors in the Department of Chemistry beyond those enrolled during the funding period.

Project Director	Jeff Manuel
Title	Developing an Internship Program in Applied Historical Methods
Award	\$6504
Abstract	This project will set up an internship program for students in a new undergraduate concentration in applied historical methods. The Department of Historical Studies is launching a new concentration focused on skills used by historians in various jobs. The concentration requires that students complete a 3-credit internship experience. This project will fund time for faculty advisor Jeff Manuel to set up the internship experience by working with community partners to secure internship opportunities, researching best practices in history internships, and establishing the coursework to be required of students doing their internships.



Project Director	Adriana E. Martinez
Title	Geospatial Technologies: Going from Global to Local with New Lab
	Development
Award	\$8000
Abstract	We are requesting funding to develop and improve the labs associated with Geography (GEOG) 418: Geographic Information Systems, a computer based course in which students learn the basics behind map making using ESRI's software ArcMap. This course is offered every semester and during the summer session. Geographic Information Systems instructs students in basic GIS techniques and tools and serves as the introductory course to a suite of courses in Geospatial Technologies that we offer in Geography. Topics include: vector and raster data, projections, queries, geocoding, GPS, and spatial analysis. In addition, this course serves our major and is the prerequisite for many courses required for the GIS minor at SIUE. Throughout the course, students complete approximately 8 lab exercises to become familiar with the software. Current labs are a combination of lab exercises from GIS textbooks and online tutorials. We would like to develop a set of fully independent labs using local geographic data that specifically targets the course and lecture objectives and allows students to hone their writing and presentation skills. Such labs would better prepare students for the GIS workforce, increase familiarity with the local area, increase rigor, expose students to the latest techniques and create a unique course.

Project Director	Mark McKenney
Title	Redesigning the Computer Architecture Course Based on Research
	Supported Learning Practices
Award	\$9085
Abstract	This project proposes a redesign of the CS~312: Computer Architecture course in the Computer Science Department. CS~312 focuses on hardware, rather than software, making it very different from most courses computer science students are required to take; furthermore, the course deals very complex subject matter.  We propose to redesign the course based on research supported strategies to improve student learning and knowledge retention. This redesign includes the use of recorded video lectures so that class time cane be spent working through problems and concepts actively. We will create short, automatically graded, online quizzes that can give students instantaneous feedback as to whether they understand core concepts, and couple this with in depth assignments that naturally take longer to grade, but provide high quality feedback. In class activities will be used to create conditions under which information recall is reinforced. Finally, the instructor will use the data from the auto-graded quizzes and quick examination of submitted homework to focus each class on the information that class is struggling with. Thus, class will be nimble and adaptive to the students' needs.



Project Director	Sinan Onal
Title	Integrating Service-Learning into the Industrial Engineering Capstone Design
	Course
Award	\$10512
Abstract	he Senior Capstone Design course is one of the most important in the four-year industrial engineering curriculum. The course concludes the Industrial Engineering (IE) student's undergraduate studies, satisfying the Accreditation Board of Engineering and Technology's (ABET) requirements and allowing students to work in collaborative teams. Although the Senior Capstone Design course currently offers integrating product/service design skills, team works, and critical thinking, students would gain additional benefits by altering the course format to one that incorporates service-learning. Service-learning is an educational approach that integrates academics with community service; students apply classroom content to community problems, thereby enhancing learning while providing needed services to underserved populations. Research has shown that service-learning enhances classroom learning, and it is consistent with theories for increasing student retention. Service-learning can take several forms, including direct service, indirect service, a consultant model, and community-based research. A new capstone course format is proposed using the community-based research form of service-learning. The proposed service-learning will address all of the ABET requirements as well as involve a collaborative research partnership in which students will conduct research to meet a community organization's needs. The two fundamental components will be designed before incorporating this model into the existing curriculum, IE senior design website and pre-class informational workshops. In addition, the course will be conducted using the following four components; formal lectures, guest lectures by invited professionals, site visits, and service-learning projects. The deliverables for this project will include (1) a detailed report describing the design, analysis, performance, and alternative approaches considered during the development/design of the project, (2) the physical prototype developed by the team, when applicable, upon compl

Project Director	Junvie Pailden
Title	Modernizing the lab materials in introduction to statistics courses using a free
	software environment
Award	\$4832
Abstract	The need for transferable computing skill set is sought after in all branches of applied and social sciences. At SIUE, students in the sciences and engineering are required to take either Stat 244 or Stat 380 - both of which have laboratory components in the morning sections. These lab exercises



use a proprietary software that, while well-designed for teaching and	
learning, is limited in terms of availability and reproducibility in basic	
research. With the rising costs of proprietary software fees and deep	ening
university budget cuts, a free software environment is a cost-effective	<del>)</del>
alternative. This project proposes to overhaul the current lab material	s and
use a popular free statistical software that is now used widely in priva	ite and
public institutions. Among the changes will be the inclusion of topics	n data
preparation and cleaning which are necessary to handle large indust	
sets. Most of the science and engineering students perform statistical	
analyses for other courses, senior projects, or future employment. Ha	
used an open-source software which is readily available is a valuable	<del>)</del>
resource and is attractive to potential employers.	

Project Director	James Panico
Title	Using Interactive Three-Dimensional Software to Facilitate Optimal
	Anatomical Understanding for Speech-Language Pathology Students
Award	\$8960
Abstract	Students majoring in speech-language pathology are required to take an anatomy and physiology course at the undergraduate level focusing on understanding respiration, phonation, articulation, and resonance which directly applies to a variety of communication disorders (e.g., articulation, brain injury, voice disorders). Given the complex nature of the material along with different learning styles, it is imperative that students have a variety of ways to interact with the course content. Currently, we are examining ways to supplement and enhance student learning and retention of this critical material as they move forward with their major coursework. The current proposal requests funds to purchase a license for a three-dimensional human anatomy database module (Primal's 3D Human Anatomy for Speech Language Pathology Software Database Module) designed specifically for speech-language pathology programs. A key feature of this database module is the ability to interact with and manipulate the anatomical images on the screen. Students will be able to view structures three dimensionally as well as from different vantage points. Furthermore, the database will be used in the classroom and is accessible to the students either on-campus or off-campus. An electronic survey will be administered at the end of the semester to all of the students in the anatomy and physiology course to evaluate the quality and impact of the proposed project. The anonymous survey will consist of a series of Likert statements regarding ease of use, enhancement in understanding the material, increase in confidence, etc. There will also be open-ended questions for students to comment on how often and for how long each student accessed the database module throughout the course. Our primary goal is to improve the level of resources available to our students to facilitate their learning and continued success within the program.



Project Director	Sangsook Park
Title	Development of a non-western art history course: Introduction to East Asian
	Art History
Award	\$5388
Abstract	I propose to develop a non-western art history course entitled Introduction to East Asian Art History for students in art education and art history programs in the summer of 2016. This course will also be beneficial to students in other disciplines at SIUE. For teaching licensure in the visual arts in the State of Illinois, non-western art history content is one of the Art Content Standards that art teacher candidates should meet. Furthermore, the multicultural art content of this course is aligned with the State's Professional Teacher Education Standards for teaching licensure. In the Art history undergraduate curriculum, art history majors are required to take two non-western art history courses, but this requirement has been waived for the last few years due to the lack of offered courses. This lack of non-western art history courses has negatively impacted art education and art history curricula. Development of non-western art history courses for undergraduate students in both the Art Education and Art History programs has become crucial.  In the proposed course, the art history of Korea, Japan, and China will be introduced and will also include a series of sessions for learning and practicing East Asian calligraphy and the Korean tea ceremony. The three goals of the course are: 1) develop students' ability to appreciate the aesthetics of East Asian art; 2) develop their understanding of how the art was made and how it plays in the history of the particular culture; and 3) help them understand how the selected cultures' artistic expressions differ from Western art. A series of lectures will be given to provide students the background of each presented culture on such art forms such as crafts, sculpture, painting, architecture, and religious art. Not only will the, students develop an understanding of the different art forms, but they also will strengthen their critical viewing and thinking skills throughout the course. In addition, through hands-on art practice of Asian calligraphy in different styles and a

Project Director	Catherine Santanello
Title	The Development of an Interdisciplinary Course in Histopathology
Award	\$4138
Abstract	Histopathology is the study of normal and diseased human tissues. A course in Histopathology enhances students' understanding of the complexity of human tissues, organs and systems, disrupted by disease states such as cancers, diabetes, drug induced diseases, etc. Histology is currently offered as a course in the Biology Department and Histopathology was taught in Pharmaceutical Sciences but discontinued because of a lack of laboratory space and supplies. The authors of this proposal would like to team-teach



Histopathology and to offer it as a larger, interdisciplinary course that can
serve the needs of Biology majors (B.S., M.S.), as well as PharmD and
Pharmaceutical Sciences (M.S.) students. The proposal seeks funds for the
purchase of a piece of equipment and some commodities that will greatly
expand the experiential, laboratory portion of the course. This experiential
component will aid in the development of the hands-on skills of the students
while enhancing the understanding of the histology and pathology of the
human body.
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Drainat Director	Carole Sullivan
Project Director	
Title	Integrating Simulation in Pediatrics in a Pre Licensure Baccalaureate Nursing
	Program
Award	\$4025
Abstract	The National Council of State Boards of Nursing (NCSBN) released a multisite, longitudinal, randomized controlled study in July 2014 that explored the role and outcomes of simulation in pre-licensure clinical nursing education in the United States. The study concluded that there is substantial evidence that simulation can be substituted for up to 50% of traditional clinical experiences. The study also concluded that similar student outcomes were achieved by students in both the traditional clinical and simulation experiences (Hayden, Smiley, Alexander, Kardong-Edgre & Jeffries, 2014). Simulation based learning experience is defined as an "array of structured activities that represent actual or potential situations in education and practice and allow participants to develop or enhance knowledge, skills, and attitudes or analyze and respond to realistic situations in a simulated environment" (Meakim, Boese, Decker, Franklin, Gloe, Lioce et al., 2013). Simulation offers a solution to the challenge in finding clinical placement of students in the southern more rural, region of Illinois, especially for specialties such as pediatrics. A diversity of pediatric clinical experiences are scheduled for students at the SIUE Regional Program site, with most of them being in outpatient and community settings. The nearest hospital for acute pediatric patients is over 100 miles from the SIUE Regional Program. In addition, clinical site placement is further challenged due to multiple schools of nursing in the area competing for placement. Along with SIUE there are four community college nursing programs requiring clinical placement of students. This creates a gap in the availability to secure specialty care experiences such as pediatrics. As the SIUE Regional Program continues to grow the need for clinical placement to provide our students with meaningful experiential learning will be critical to their success. The use of simulation in this situation is an innovative and pedagogically sound alternative for bridging that gap in



Project Director	Christopher Theodorakis
Title	Development of an Online ENSC 330-Envrionmental Health and Waste
	Management
Award	\$7469
Abstract	This proposal is to develop an online version of Environmental Science (ENSC) 330-Environmental Health and Waste Management, which will be offered during the summer session. This course covers biological, chemical, physical, and radiological health hazards in the air, water, soil, in the outdoor environment, home, urban environments, and in the workplace. This course also is a requisite for the ENSC minor and a requirement for the Environmental Health track of the new major starting fall 2016. This course will serve to purposes of 1) accommodating growth in enrollment in this course, 2) enhancing enrollment in the Environmental Sciences Program and SIUE in general, and 3) providing flexibility for students who would otherwise not be able to enroll in this course. This course would also enhance online course offerings for SIUE, an initiative that has been the focus of this university in recent years.

Project Director	Anne Werner
Title	Virtual Statics and Mechanics for Builders, Architects and Engineers
Award	\$12473
Abstract	The proposed project includes the design, development, evaluation, and use of a virtual software program specifically for the Construction Management course CNST 241 "Statics and Mechanics of Materials," but will be located on a public website so that anyone can access and use the program. The program will allow students in the CNST 241 course to explore various concepts presented in the class on their own using a simplified game-based environment with various scenarios. It will provide the students with an alternative method for learning the course material. Research shows that the use of online software programs, like the one proposed here, can help students improve understanding of material and enhance their interest in a particular course or subject. Accomplishment of the project requires a multidiscipline team of construction management faculty, a consulting computer science faculty member, and two undergraduate computer science students. The project will take one year to complete but the resulting software program is intended to be used for many years by the construction management program. The project will be evaluated and modified during the year in response to student input and performance. The estimated cost is \$12,473, the majority of which will pay for two undergraduate computer science students for 9 months of work.

Project Director	Laura Wolff
Title	Utilizing Peer Mentors to Improve Retention and Success Rates in Gateway
	Principles of Economics Courses
Award	\$3960
Abstract	Based on Fall 2014, Spring 2014 and Fall 2015 data, as many as one in two
	students enrolled in my sections of Principles of Economics courses will not



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complete the course with the grade necessary to proceed in the programs which require Principles of Economics for their major. Many drop or disappear. Enrollments are projected to increase 20 percent for the 2016-17 year, going from a cap of 80 per section to a cap of 96. This will only expand the number that go unnoticed in a teaching load of 388. Many of these students are either brand new freshman or students repeating the class, often not changing any of the prior practices that led to failure the first (or second) time around. Poor attendance and poor study skills are part of the problem; they have yet to develop the skills and behaviors of successful students. This project will introduce a peer role model into the class, drawn from past students who have successfully navigated both the transition to the university and Principles of Economics. These peers should be credible, as they understand the skills, knowledge and behavior that was recently required for them to successfully complete both the class and the broader challenges facing entering freshman. Success will be measured first as a decrease in the number of students receiving WR and NS grades, and second by the overall percentage of students in the course that receive an A, B, or C compared to past terms.