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Last April, Chelsey Schrock studied abroad in Pacchia Amos, Crete in Greece. Under the supervision of Dr. Susan Kirkpatrick Smith, Chelsey did her undergraduate research at the Institute for the Study of Aegean Prehistory (also known as the INSTAP Study Center of East Crete) on bones buried during Rome’s invasion of Crete.

“This affected their burial practices and their health,” Chelsey said, “Looking at these bones can shed light on if there was a large cultural or even biological effect on the population.”

INSTAP was established in 1982 as a non-profit organization to spread archaeological fieldwork and knowledge on the Aegean region and the Paleolithic period. The organization provides a variety of grants, from first-time archaeological students to people studying to obtain their doctorates.

Before attending the institute, Chelsey couldn’t decide between pursuing Osteology or Forensic Anthropology. She ultimately decided on Osteology and Paleopathology, thanks to her experience at the lab.
During her time in Crete, Chelsey researched a Roman burial site. One of the skeletons she cleaned and studied had a coin in its mouth; Romans placed coins in the mouth of the dead so the person would have access to cross the river Styx into the underworld. Styx is the boundary between the real world and the underworld, where humans would pay the ferryman Charon for a ride on the river.

“I initially felt excited and confident with osteological analysis. I expected to put my knowledge to work and apply the skills that I had acquired in my Forensic and Physical labs,” Chelsey said, “I definitely applied a majority of what I learned, especially when assessing age and sex of individuals as well as certain conditions on the bone (pathologies).”

Schrock said she had a good intuition about the program, stating that it “absolutely delivered”.

“I also received a more hands-on, intensive, and in-depth lesson on dentition as well as identification of small fragments of bone.” she mentioned.

“Looking at these bones can shed light on if there was a large cultural or even biological effect on the population.”

“I have gained real world experience that will look great when I apply for jobs or graduate school, grown closer to those who studied with me in Crete, and have the opportunity to present my findings to established and respected anthropologists.” Chelsey said of her experience.

She plans to submit her research abstracts to the Georgia Academy of Science, The KSU Student Scholar Symposium, and the American Association of Physical Anthropologists meeting.

Chelsey will be returning to the Institute for the Study of Aegean Prehistory next year as assistant director of the field school.
In 2014, the CEO of Tesla Motors, Elon Musk, famously stated that the 2015 version of his cars would be capable of self-driving up to 90% of the time. Musk also predicted that the technology for fully autonomous cars would be ready by 2020. But how accurate were his optimistic predictions?

Prominent automakers including Honda, Ford, Mercedes, Audi, and General Motors are already developing self-driving cars. With parking assistance, automatic braking, and adaptive cruise control, some cars have already become semi automatic.

Kennesaw State Assistant Engineering professor Dr. Kevin McFall hosted three Brazilian undergraduate students as research interns to study autonomous vehicles this past summer as part of the Institute of International Education Brazil Scientific Mobility Program.

“Every indication is that self-driving cars will soon be commercially available with increased safety, decreased congestion and convenience cited as the primary benefits.” McFall said about his research.

Dr. McFall presented his findings, “Using Visual Lane Detection to Control Steering in a Self Driving Vehicle”, in October at the International Conference on Social Innovation and Community Aspects of Smart Cities in Bratislava, Slovakia. The project was funded by the Division of Global Affairs Strategic Internationalization Grant.

“Traditionally, most engineering research requires a vast skill-set including advanced mathematics, theoretical physical modeling, computer programming ability, and knowledge of experimental instrumentation.” Dr. McFall said about his expectations for undergraduate research, “Directing undergraduate research projects at first appears impossible with the expectation that undergraduate students contribute significantly without possessing the required skills.”

Dr. McFall has studied and worked extensively overseas for over a decade. He studied abroad at Luleå University of Technology in Sweden during his senior year as an undergraduate student at Virginia Tech. The next year, he studied his masters in Japan at the Japan Atomic Energy Research Institute, where he worked on the International Thermonuclear Experimental Reactor project. He completed his M.S. in Mechanical Engineering at MIT and earned his Ph.D. in Mechanical Engineering at Georgia Tech’s satellite campus in Metz, France.

Dr. McFall also presented a keynote address, “Artificial Intelligence and Autonomous Vehicles” on November 6 at the International Congress of Innovation and Technology hosted by the Instituto Technológico de Soledad Atlántico in Baranquilla, Colombia.

Two of Dr. McFall’s undergraduate students presented their research on an autonomous go-kart frame that would be used to test
autonomous driving on November 7-8 at the Early Career Technical Conference in Birmingham, AL.

“Certainly, the results of undergraduate research cannot compete on a level playing field with research-first universities employing graduate students,” Dr. McFall clarified, “However, the work that goes on at a place like the Southern Polytechnic College of Engineering and Engineering Technology is significantly more practical and applied compared with research-first universities.”

The Assistant Engineering professor explained that this type of application grants the students the opportunity to see their work’s results and effects in a shorter period of time. This allows them to draw connections from their research to their coursework and co-curricular activities, such as competitive teams. Dr. McFall also finds that this type of research helps students develop and become proficient in professional skills that are used in the industry.

Undergraduate research on autonomous vehicle development has impacted both the automobile industry and undergraduate students positively. Car buyers can anticipate autonomous cars in the next decade and undergraduate students who participated in research under Dr. McFall’s direction can look forward to a skilled advantage in their desired career field.

“Every indication is that self-driving cars will soon be commercially available with increased safety, decreased congestion and convenience cited as the primary benefits.”
Research looks much more glamorous and exciting when you’ve never done it before,” said Kennesaw State University senior Tim Fisher, “Everyone always talks about the ‘Eureka!’ moments and the serendipity that led to their breakthrough, but nobody ever mentions the false starts, dead ends, or the otherwise-promising data sets that stubbornly refuse to reveal their secrets.”

Tim conducted research on Controller Area Network (CAN) buses used on modern vehicles. CAN buses are designed to allow microcontrollers and devices to communicate with another without the use of a host computer. The concept was first created in the early 1980s but has now become more sophisticated to the point that engineers are now using them for autonomous vehicles.
However, research and experimenting didn’t come easy to Tim. He aimed to develop a connecting laptop to a CAN bus but had trouble finding information on how to progress. All the information he needed was scattered across the internet and physical research papers. However, when there’s a will, there’s a way.

“If you don’t let those problems beat you, they make the end results that much better, though, both in the technical sense and in how much satisfaction it brings you personally,” he said. So, Tim made it his goal to not only decode the CAN bus’ network activity but to also create an instruction manual for future engineers so they can save time on using scattered research.

Tim presented his findings at the University of Alabama Birmingham’s 15th Annual Early Career Technical Conference. The conference is held annually as a forum for engineering students and early-career engineers for polishing their technical credentials and presentational skills.

“It’s a great boost to self-confidence to know that you can solve engineering problems that don’t have an answer in a solution manual somewhere.”

In his research, Tim mapped out accessible CAN codes to filter out the less important data in favor of more useful automobile data, such as cruise control. He used a 2012 Kia Optima to test the CAN vehicle bus, sending out high-voltage and low-voltage messages to test their signals. Each message a CAN node sends out is called a frame and each frame contains an ID number that determines its priority/importance. A node’s message will be transmitted completely if it’s transferred without any interruption.

In his conclusion, Tim found that the Kia only had autonomous vehicle potential through unconventional means. Otherwise, the vehicle itself lacked the wiring systems to drive automatically.

“I definitely learned a lot about myself during the research process,” Tim said of his research, “It’s a great boost to self-confidence to know that you can solve engineering problems that don’t have an answer in a solution manual somewhere. I’m also, I think, more self-sufficient and proactive now that I’ve had some autonomy in problem solving. On one hand, I didn’t have much in the way of specific directions aside from being told to get information from the CAN bus. On the other hand, I had the opportunity to decide for myself the merits of different approaches.”
The Urban Cohort is a group from the Bagwell College of Education that is focused on teacher candidates who are finishing their coursework and field experience in the Area 2 section of Cobb County. The group has been funded by the Teacher Quality Partnership (TQP) Grant for the past five years and focuses on training teachers in urban schools.

The Urban Cohort internship is selective and demanding - it requires participants to adapt to the unique environments and demands urban schools have. The focal schools are typically the most challenging and call for the most first-rate educational students. The group’s 2014-2015 program was the last one to be financed by the TQP Grant.
Senior Lecturer Katy Basch taught the Early Childhood Teacher Candidates in the Urban Cohort for several years.

“Its final years have surpassed all of my expectations,” Basch said, “We had spent the spring semester addressing child development and best practices in preschool curriculum.”

In return, the TQP conveyed interest in extending the group’s funding by having the members present their research and course content to other teaching students. So, the Urban Cohort wrote and submitted a proposal to the Georgia Association of Young Children’s annual conference on their research and were accepted.

“This experience was important for my students since research is not a typical activity for undergraduate Teacher Candidates.” Basch said, “Few students at this level have the opportunity to research and present.”

The presentation, Developmentally Appropriate Teaching through Integrated Practices, was delivered in September 2015 and focused on creative methods and hands-on activities on meteorological thematic units. The submission was met with positive reception and was presented again at the National Conference on Undergraduate Research (NCUR). The teacher candidates enjoyed the experience so much that some expressed interest in working on more research and presentations in the future.

“I found the experience enriching to work with such inspired students outside of our regular course content,” Basch said, “I hope to continue working with the Urban Cohort and other undergraduate Teacher Candidates in research opportunities in the future.”
Pilates is one of the most popular fitness routines in the United States, with over 5 million participants. The focus of the exercise routine is controllability and it builds core strength, improves posture, and increases flexibility. However, not many people know the origins of Pilates and there are a lot of myths and concerns surrounding it.

Dr. Sarah Holmes studies, researches, and teaches Pilates as part of the Dance department at Kennesaw State. She is currently writing a manuscript for her research in Reforming Pilates: Ballet, Masculinity, and the Construction of a Gendered Practice, due in 2017. She signed a publishing contract for the book with Wesleyan University Press in 2014.

“This has been a very long process,” Dr. Holmes said of her dissertation, “Much of the research has been completed - of course, there’s always more that can be done.”

The subject of her research began with a commonly asked question from her clients, “Isn’t Pilates for dancers?”

“I was perplexed by this assumption, and wondered why a large percent of Pilates teachers are, in fact, former dancers,” Dr. Holmes explained, “This question led me to consider more fully the relationship between dance and Pilates.”

When starting her research on the history of Pilates in the United States, she found the historical books too linear and objective. Dr. Holmes sought critical analyses and scholarly research.

Thus, she decided to write about the lack of academic and historical information on Pilates and its relation to dance in Reforming Pilates. The dissertation also discusses the historical gender connotation with the subject.

Describing her research process, Dr. Holmes said, “I utilized my teaching training, PhD course work, ethnographic process, interviews with fellow Pilates teachers, and (very sparingly) my personal experiences teaching.”

“It made me look at Pilates very differently - it actually shattered my love for the work -- but after I picked up the pieces, and put it back together again -- I have grown to love it even more,” Dr. Holmes said. “I firmly believe that it’s an incredible method to help people in all aspects of their lives - young dancers especially so. While I get paid to teach Pilates, I volunteered at the YMCA for over six years, and reached more people with Pilates then I ever thought I would. That’s incredibly rewarding. That said -- my research direction at this point is even more provocative than before. So, I suppose I’m
going to shake it once again... but -- that said - I hope that once I reach the other side -- it will be unbreakable!”

“I suggest that many students of Pilates, primary women, practice Pilates without knowing or understanding its residual traces of its masculine roots,” Dr. Holmes said, “And how the involvement of the ballet and modern dancers actually created the space for women’s participation in the exercise practice.”

Along with her work at Kennesaw State, Dr. Holmes has also been a teacher trainer for Peak Pilates since 2008. Her previous academic publications revolved around Pilates as well, exploring topics such as methodologies and race behind the exercise movement. Since arriving at KSU, she has also felt welcome in the community by her department’s faculty and students and believes that student research is important for their development into becoming critical thinkers.

“Student researchers add a new dimension to the research process,” Dr. Holmes said, “They have new insights into the investigatory process that I haven’t realized. Collaboration is becoming fundamental to the field of the arts. What concerns me the most is how some (but not all) students in the arts don’t fully understand the need to develop their scholarly voices.”
KSU WILL HOST NCUR 2019
Kennesaw State University will be hosting the 33rd annual National Conference on Undergraduate Research (NCUR) in 2019. NCUR is sponsored by the Council on Undergraduate Research (CUR) and provides an opportunity for undergraduate students to present and interact with others about their research. NCUR 2019 will be the first time the conference will be held in Georgia.

CUR defines undergraduate research as “an inquiry or investigation conducted by an undergraduate student that makes an original intellectual or creative contribution to the discipline.” This research is typically posted on scholarly and academic databases and sometimes in journals as well.

“We are excited for the nation's undergraduate researchers to have a chance to present their work at our institution and see all that Kennesaw State has to offer,” said Dr. Amy Buddie of the announcement. Dr. Buddie is the CETL Associate Director for Undergraduate Research/Creative Activity, “We are also thrilled that KSU students will have a first-hand look at cutting-edge undergraduate research from around the country. It is a big honor to be chosen as the host site from among the many applications that NCUR had to choose from.”

Established in 1978, the Council on Undergraduate Research (CUR) was started by chemists attending private liberal arts
colleges who wanted to provide a way for students and faculty to share high quality research. As of today, there are over 10,000 members of CUR from over 650 institutions. The subjects of research shared at NCUR include Arts & Humanities, Biology, Chemistry, Education, Engineering, Geosciences, Health Sciences, Mathematics and Computer Science, Physics and Astronomy, Psychology, and Social Sciences.

“CUR was very impressed about the state of undergraduate research at KSU during their campus visit,” said CETL Executive Director Dr. Michele DiPietro, “Hosting NCUR will have a transformative effect on campus for years to come. It will usher in a new era for undergraduate research here at KSU.”

For more information about CUR, visit their webpage at www.cur.org.

CUR uses five Strategic Pillars for organizing and implementing the future of undergraduate research and their own mission:

1) Integrating and Building Undergraduate Research into Curriculum and Coursework

2) Assessment of the Impact of Undergraduate Research

3) Diversity and Inclusion in Undergraduate Research

4) Innovation and Collaboration in Undergraduate Research

5) Internationalization and Undergraduate Research

This year’s NCUR will be held in Asheville, North Carolina from April 6 to April 9. The conference typically pulls in around 5,000 attendees and features three keynote speakers. This year’s speakers will be David George Haskell, Bryant Terry, and Dianne Stewart. The conference will also include a graduate and career fair.
GET INVOLVED!

JOIN UNDERGRADUATE RESEARCH CLUB

Are you an undergraduate looking to get involved in research? Consider joining the Undergraduate Research Club (URC), a Registered Student Organization (RSO) with a lot going on! For example, you can:

- Engage in collaborative research projects with other members of the club. Projects are typically about topics that are of general interest to the campus (e.g., alcohol use and perceptions of safety)
- Help coordinate the Symposium of Student Scholars
- Help evaluate submissions to the Kennesaw Journal of Undergraduate Research
- Write articles for the Undergraduate Research Newsletter

To learn more information, visit our website at: cetl.kennesaw.edu/undergraduate-research-club-urc or email us at urckennesaw@gmail.com.

Like us on Facebook: facebook.com/KSU-Undergraduate-Research-Club-310874508955854/

The next Undergraduate Research Club meeting is April 15th at 2:00 PM in Clendenin 1003. We hope to see you there!
21st ANNUAL SYMPOSIUM OF STUDENT SCHOLARS AND UNDERGRADUATE RESEARCH RECEPTION

APRIL 21, 2016

Recognizing excellence in student scholarship & creative activity
IMPORTANT DATES

Symposium of Student Scholars Applications are due March 28, 2016
The 21st Annual Symposium of Student Scholars will be held on April 21, 2016. Submissions are due on the above date at 11:59 pm. Students of all majors and disciplines are encouraged to participate. cetl.kennesaw.edu/symposium/call-for-proposals

URCA Applications are due April 1, 2016
CETL will fund up to $500 of travel expenses for URCA undergraduate researchers. The next application deadline is listed above, due by 11:59 pm. cetl.kennesaw.edu/faculty-funding/undergraduate-research-creative-activities-urca

Undergraduate Research Club Meeting is April 22, 2016
End-of-year cookout: 2:00 PM at the Gazebo.

NEWSLETTER SUBMISSIONS
Do you have research that you believe should be highlighted? Do you have a story to share or advice to offer regarding undergraduate research? Your submission could be featured in an upcoming issue of the Undergraduate Research and Creative Activity Newsletter. All inquiries should be made as soon as possible.

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Email cetl4ur@kennesaw.edu or call CETL at (470) 578-6410 to submit ideas.

Kennesaw State University
Center for Excellence in Teaching and Learning
3211 Campus Loop Rd, MB 5400
Kennesaw, Ga 30144
Phone: 470.578.6410 • cetl@kennesaw.edu • cetl.kennesaw.edu