CSMConnect is the College of Science and Mathematics (CSM) biannual newsletter designed to keep you informed of the latest activities and developments going on in the college. CSM values the networks developed with partners on and off campus. You are important in our network of partners.

The College of Science and Mathematics (CSM) provides students a high quality and innovative academic experience through our six minor programs, eight undergraduate degrees, three masters programs, and the Ph.D. in Analytics and Data Science degree. Students can create their own learning experience through provided tracks, research, and specialized courses. CSM is soaring into the next level of national prominence through cutting-edge research.

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Kennesaw State University wins $900,000 NSF STEM grant
Spring is upon us, and Kennesaw State University is rapidly approaching the end of another successful academic year. As has been the case in recent history, there has been some significant activity at the University and with the College over the last 12 months.

President Dan Papp retired from KSU at the end of the 2015-2016 academic year. President Papp led the University through a period of unprecedented growth, both in the number of students attending KSU, but also in the visibility and national reputation of the University. When President Papp started as the President of KSU, the University enrolled approximately 15,000 students. This year saw over 35,000 students enroll at KSU. The University grew to a leading comprehensive university in the Southeast, and was recognized as a doctoral university with moderate research activity by the Carnegie Foundation. Dr. Papp’s imprint is found throughout KSU, and we thank him for his dedicated service to the University.

KSU welcomed its fourth president, Sam Olens on November 1, 2016. President Olens most recently served the State of Georgia as Attorney General. President Olens comes to KSU with a wealth of leadership and organizational experience. We look forward to working with President Olens as he leads KSU into our second 50 years.

A recent study by the Office of the Vice President for Research at KSU found that faculty from the College of Science and Mathematics account for nearly 45% of all grant funding coming to the University. Most of this funded research involves undergraduate and graduate student collaborators. Engagement in discovery research activities provides an integrative experience that helps students make connections between the different courses of their curriculum. The College has several mechanisms for supporting undergraduate students to be involved with discovery research activities. The Birla Carbon Scholars program funds 10 students each summer so they can engage in research full-time during the summer months. The Mentor-Protégé program supports student research throughout the year and travel to professional conferences so students can present their research to the professional community.

The College recently started a Student Success strategic plan. One goal of this plan is to scaffold research experiences throughout the curriculum. This is one way of introducing research to all of our students, and it insures that all students experience the integrative value of research during their studies. To support the Student Success plan, Drs. Adrian Epps, Marla Bell, and Scott Reese were recently awarded a grant from the University System of Georgia through their STEM success program. This grant focuses on expanding the Mentor-Protégé program to give more students opportunities to engage in discovery research activities. The grant also allows the College to implement many high impact practices in our courses.

The College has been sponsoring Faculty Learning Communities led by Dr. Kadian Callahan the last 2 years to help faculty learn about high impact teaching practices. These FLCs provide an opportunity for faculty members to share with each other best practices in teaching that they implement, and learn about other teaching practices. One practice the College is focusing on is using upper-division undergraduate students as peer-instructor, problem solving facilitators. This practice allows faculty to use portions of their class-time to engage students in problem solving activities. The utilization of peer-instructors allows a large enrollment course to have the feel of a small class by breaking out into small groups to work on the problems.

Despite all the change KSU has experienced over the last several years, one thing has remained constant – our dedication to the success of our students. We look forward to continuing to serve our students. I invite you to come visit KSU and learn first-hand about all the good work our faculty and staff of the College of Science and Mathematics are engaged with.
Researchers hope to use plants to clean up radioactive soil

Dr. Daniel Ferreira, an assistant professor of environmental science, along with senior biology student Elena Ninova are trying to find a way to help with devastating effects of the massive radioactive accident at Japan’s Fukushima Daiichi nuclear plant six years ago.

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Enrollment continues to climb at Kennesaw State

Kennesaw State University enrolled a total of 35,018 students for fall 2016, a 5 percent increase over the previous year, according to a recent official tally from the Office of the Registrar.

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Oak pollen more potent than pine

Dr. Joel McNeal, an assistant professor of biology, knows his pollen well. Like why wind-borne pollen is so problematic, why pine trees are to blame for your car’s new shade of yellow exterior, but it may not be to blame for your allergies, and what you can do to avoid the worst of it.

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Math educator selected as 2016-17 Governor’s Teaching Fellow

Belinda Edwards, an associate professor of mathematics at Kennesaw State University, has been selected as a 2016-17 Governor’s Teaching Fellow. As one of 13 faculty members from institutions of higher education across the state, Edwards was named after a highly competitive application and selection process.

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Kennesaw State University master’s student Brandy Riekert’s passion for conservation biology translated into two major wins recently, which provide a combined $5,000 in grant and award monies. Both reward her research on the Harper’s Dodder, a rare and endangered native plant vine known to grow only in Georgia and Alabama.

Riekert was awarded a $4,500 Catherine H. Beattie Fellowship award from the Garden Club of America and Center for Plant Conservation, and the Jeane Reeves Research Grant from the Georgia Native Plant Society for $500, according to Professor of Biology Susan M. E. Smith, coordinator of the master’s program in integrative biology.

“It is a huge achievement to win one grant as a student, but two is amazing,” Smith said.

Riekert’s research examines population genetics and distribution of Harper’s Dodder (Cuscuta harperi), a rare and threatened parasitic vine native to a few scattered populations in Georgia and Alabama. A member of the Convolvulaceae (morning-glory) family, the annual Harper’s Dodder is a coiling orange vampire vine with tiny white flowers smaller than the head of a pin.

It lacks leaves and roots to acquire food, so its uses specialized structures known as haustoria to attach primarily to Small-headed Blazing star and Nuttall’s Rayless Goldenrod in the spring and summer to extract water and nutrients.

“It is a habitat specialist,” Riekert explained, “occurring only on particular sandstone and granite outcrops, and it is also specialized as to the host plants it can grow on, overwhelmingly utilizing only two wildflowers in the sunflower family.”

Riekert, who is on track to graduate with a master’s degree this spring, is further investigating through greenhouse experiments and field research why the vine is attracted to these specific wildflowers.

“I am asking several interesting questions about population distribution and genetic relationships within the limited range of my research organism, Harper’s Dodder,” she said. “I also have a branch of my project that involves outplanting of the species, which is rare and considered at risk of extinction, onto protected habitats, as well as genetic safeguarding of populations in partnership with local conservation agencies and botanical gardens.”

Her transplant work in this project was instrumental in her receiving the Jeane Reeves Research Grant, she explained.

“The Jeane Reeves Research Grant is specifically described as supporting protection of native plants and the relocation of endangered plants to protected areas, so I feel like that aspect of my project was likely a large factor in the decision to award me the grant,” Riekert said.
Conservation of different plant species is important to the continuation of any ecosystem’s success, and perhaps none more so than an endangered species like the Harper’s Dodder.

“While some related species are known to be agricultural pests, Harper’s Dodder is so specialized to its host and habitat that it poses no risk to crops or garden ornamentals,” she said. “It also appears to have little to no effect on the fitness of its wildflower hosts.

“It is of conservation interest as a charismatic botanical species, and worth protecting as part of the overarching goal of preservation of biodiversity. Additionally, studying the mechanisms of host use in a non-weedy species within the genus Cuscuta can potentially give insight into the mechanisms that lead to weediness and crop damage in other members of the genus.”

Riekert, who also received a Dalton State Foundation Summer Research Stipend as an undergraduate for her work with captive conservation of endangered turtles, plans to continue working on the conservation-based part of her project after completing her thesis work.

“I have always been passionate about conservation biology, and I am particularly interested in managing for protection of endangered species that are at risk due to habitat misuse and destruction,” Riekert said. “Also, I am intrigued by the unique life history of my research organism, and the extreme heat and drought conditions under which it grows in its rock outcrop habitat.”

After completing her master’s degree at Kennesaw State, Riekert plans to teach at a community college.

“I want to mentor undergraduates at that level who are interested in pursuing research,” she said. “I am also interested in pursuing a Ph.D. in the future.”

Assistant Professor of Biology Joel McNeal, who serves as Riekert’s major professor, said, “Brandy hit the ground running from the moment she arrived in my lab, spending nearly every Friday and many weekends traveling across Georgia and Alabama to complete all of her seed and DNA sampling during her first three months in our graduate program. Her success in acquiring external funding is a testament to her abilities as a field biologist, a lab scientist, and an excellent scientific writer and communicator.”

As a biology undergraduate, Reuben Hilliard (Biology Spring ’15, MSAS Fall ‘16) conducted research in the Paula Jackson lab. He has continued to work with Dr. Jackson during his graduate studies by analyzing data from their research while currently enrolled in the Masters of Science in Applied Statistics program. Reuben presented part of the results from the research at the 2016 SAS Day competition at KSU, where he won top poster award. Hilliard is a 2015 Clendenin Scholar and received the CarMax Academic Scholarship consecutively in spring 2016 and 2015. His research intersects the disciplines of biology and statistics, focusing on environmental sciences.
Cole Daniel celebrated his graduation in Fall 2016 from Kennesaw State University this month by receiving not one degree, but three. However, he shrugs off his rare accomplishment.

“I think it’s a bigger deal for my parents than it is for me,” Daniel said with a smile.

Daniel received bachelor’s degrees in biology, economics and finance at the December 2016 commencement. A University Honors Program student with a 3.66 grade point average, he graduated with Kennesaw State’s highest academic honor – Honors Scholar, which requires completion of Honors Program curricular requirements and graduation with a GPA of 3.5 or higher.

What’s more, Daniel is Kennesaw State’s first Honors Scholar to earn three simultaneous degrees, according to Honors Program director Liza Davis. He enrolled in as many as 19 credit hours per semester and took at least two summer courses each year at Kennesaw State, completing 214 credit hours.

“I certainly have enjoyed college, which is a testament to the quality of KSU’s faculty and opportunities,” Daniel said. “I chose biology, finance and economics in order to have a career in investment banking specializing in healthcare and biotechnology.”

Daniel aspires to be involved in investing in the pharmaceutical industry and the development of cancer-fighting drugs. He feels that his knowledge of finance and
“It takes billions of dollars just to bring one major drug to market,” Daniel said. “So my goal is to go to these big pharma companies and say, ‘I’m going to give you the capital necessary to research and develop this drug. In return, I want you to offer the drug at a lower price to consumers.’”

Medical advancements are of particular interest to Daniel, who was diagnosed in high school with Meniere’s disease, an inner-ear disorder that can result in vertigo, hearing loss, ringing in the ears and ear pressure. Daniel enrolled at Georgia College and State University as a freshman, but transferred to Kennesaw State to be closer to home following an incident of vertigo and nausea so severe that he had to be hospitalized. He manages his Meniere’s disease by taking medication and avoiding situations that could trigger his vertigo.

However, it was a different medical condition that inspired Daniel’s interest in a health care-related career. He was born with hydrocephalus, a buildup of fluid in the brain, and underwent life-saving surgery as an infant.

“I want to give back to the industry that saved my life,” Daniel said. “With all my medical issues, it is a small medical miracle that I am as able as I am today. It is a testament to what can be done and how far we have come in the medical field.”

Daniel began as a biology major, planning to become a dentist. His interest in economics and finance developed through courses he took from professors Ann Gillette and Randall Goodwin, and he gained practical experience by serving as the chief economist and chief global officer of the Student Managed Investment Fund in the Coles College of Business.

In addition, Daniel spent a semester studying abroad, earning a Japan-Asia Studies Certificate from Soka University in Japan. He also received a Certificate in Leadership Studies from KSU’s University College.

“Cole is extremely inquisitive and thinks deeply about how things connect,” Gillette said. “He is a high achiever with a great moral compass. I am proud to know him and look forward to watching his life path develop.”

Now, after transferring schools, completing more than 200 credit hours and overcoming health problems, Daniel’s six-year journey to earning three bachelor’s degrees is nearly complete. As he looks forward to starting his career, does he consider all the time and effort in college worth it?

“It doesn’t come down to the size of your paycheck – it’s whether you can live the quality of life that you want to live,” he said. “As long as I have the quality of life I want, then that would be success.”
Kennesaw State University hosted a mini-conference as part of its fifth annual KSU R Day, a regional meeting for the analytics and “R” community that links the statistics program at KSU with businesses and organizations that use analytics and statistics. “R” refers to the popular open-source statistical software used by many organizations around the world.

Kennesaw State’s Department of Statistics and Analytical Sciences showcased a wide range of topics from 45 undergraduate and graduate statistics students’ work in R. The event featured 39 poster presentations of students’ research in a diverse range of categories including healthcare, marketing/business, sports and social/political sciences, as well as several speakers who discussed analytics and the use of R in their organizations.

“We had 239 people in attendance with representatives from 50 companies, allowing some of the students to discuss collaborative projects with local businesses,” said event organizer Nicole Ferguson, assistant professor of statistics in the Department of Statistics and Analytical Sciences.

“KSU R Day provides our students with a great networking opportunity to meet with regional R users, allowing them to begin building their professional network, and giving them a look at real-world careers available to them in advanced analytics,” Ferguson said.

James E. Bolles, architecture and platform manager of the Southern Company, was the keynote speaker. Bolles said he was “really inspired by some of the projects I’ve seen today. I see how passionate you are about your work.”

Bolles told the students they are embarking on exciting careers in a field that is only its infancy today.

“We will have a lot more data coming online in the future, and you’ll have to be able to confirm what is the good from what is the bad data,” he said.

Bolles was followed on the dais by Mike Judd, surveillance epidemiologist with the Centers for Disease Control and Prevention, and Ana Baida, executive director of Kennesaw State’s Career Planning and Development. Three candidates for the MS in Applied Statistics – Amanda Bayless, Mark Bryan and Hye Jin Kang – presented a sentiment analysis of the first 2016 Presidential Debate.

Baida spoke to employers and students alike, saying, “KSU R Day is an example of the ‘best of’ career development – when well prepared students interface with employers who are seeking their talents. Our students showcase this skill set to employers poised to hire.”
The College of Science and Mathematics welcomed new faculty, celebrated new funding opportunities for many of our colleagues, and has been selected to host a prestigious research symposium. Here are a few highlights:

The Physics Department welcomes Department Chair and Professor, Kevin Stokes, who joins us from the University of New Orleans. Dr. Stokes is an experimental materials physicist who studies the thermal and electrical transport, and optical and magnetic properties of nanostructured materials and composites.

Professor of Physics Nikolaos Kidonakis, was honored with KSU’s 2016 Outstanding Research and Creative Activity in the Natural and Physical Sciences Award. Dr. Kidonakis is a theoretical particle physicist, who last year received $150,000 in support from the National Science Foundation for his research on High-order Calculations for Top Quark and Higgs Production.

Dr. Carol Chrestensen, of the Department of Chemistry and Biochemistry, has been appointed the first Salerno Research Professor in the College. This position honors the many contributions of our dearly departed colleague Dr. John Salerno, and continues his legacy of fostering the research community of the College.

KSU’s Associate Vice President for Research and Professor of Biochemistry Jonathan McMurry received $401,972 in funding from the National Institutes of Health to conduct research on developing a novel strategy for the manipulation and labeling of the interior of living eukaryotic cells for research, diagnostic and therapeutic purposes.

The College’s Associate Dean for Research and Associate Professor of Biology Marcus Davis received $358,803 in funding from the National Science Foundation to conduct research on the genetic circuits of fin and limb development, including many genes linked to human birth defects.

Associate Professor of Biology Martin Hudson was awarded $378,561 from the National Institutes of Health to use advanced optogenetic techniques to study how neuron shape affects function and behavior.

Associate Professor of Biochemistry Michael Van Dyke, Associate Professors of Biology Marcus Davis and Martin Hudson, and Assistant Professors of Biology Melanie Griffin and Joel McNeal received a $65,063 grant from the National Science Foundation for the acquisition of instrumentation which can determine DNA/RNA quantity and quality. These instruments expand the capabilities of the College’s recently established Nucleic Acids Core Facility, and are now available for researchers and students to use in their genomic based projects.

The Department of Molecular and Cellular Biology will host the annual Southeastern regional Society of Developmental Biology Meeting May 19-21, 2017. Approximately 150 attendees, including invited speakers, undergraduate and graduate students, post-docs, and other researchers from throughout the region will present their latest research. Organized by Assistant Professor of Biology Lisa Ganser and Associate Professor of Biology Scott Nowak, the meeting will include oral and poster presentations and a grant writing workshop.
Two Kennesaw State University scientists have received a total of $737,364 in National Science Foundation and National Institutes of Health grants for developmental biology research into autism and birth defects.

The National Institutes of Health (NIH) awarded Martin Hudson, an associate professor of biology in the Department of Molecular and Cellular Biology, a grant of $378,561 to research how neuron shape affects function and behavior in the nervous system. The research could have ramifications for autism and many other neurological disorders, including Parkinson’s disease and schizophrenia.

Marcus C. Davis, associate dean for research and associate professor of biology, received a grant for $358,803 from the National Science Foundation (NSF) for research demonstrating that common genes form fish fins and human hands, results which ultimately could lead to eradicating limb birth defects and – in the future – allow humans to regrow limbs.

“Martin Hudson and Marcus Davis have been doing cutting-edge developmental biology research at Kennesaw State for years,” said Jonathan L. McMurry, associate vice president for research and professor of biochemistry. “This success is a recognition of their excellence and underscores our emergence as a research university and burgeons our growing portfolio of federal research grants. We now have 22 NSF and 7 NIH grants.”

“Martin Hudson and Marcus Davis have been doing cutting-edge developmental biology research at Kennesaw State for years”
- Dr. Jonathan L. McMurry, Associate Vice President for Research
Mike Dudgeon
Chief Technology Officer
Hi-Rez Studios

Math, Nerf Guns, and Late Nights:
The Inside Story on Being Paid to
Program Video Games

Monday, March 27, 2017
2:00-3:00pm
Reception to follow

About the Talk: When you ask recent computer science graduates what type of business they want to work for, a large number will say video games. The video game industry is very competitive for CS jobs, and those who work in the industry tend to love the work and never want to leave the sector. In this talk, Mike Dudgeon will explain how Atlanta based Hi-Rez Studios, creator of Tribes: Ascend, SMITE, and Paladins, was founded, and what it is like to work as a programmer in the video game industry. Lastly, the presentation will also include how politics and technology intersect.

About the Speaker: Mike Dudgeon joined Alpharetta based video game startup Hi-Rez Studios in 2008, where he currently serves as Chief Technology Officer. Mike holds a Bachelors and Masters degree in Electrical Engineering from Georgia Tech, five U.S. patents, and has been an entrepreneur in the technology business his entire career. Mike Dudgeon is a former six year State Representative for District 25, which covers the southern part of Forsyth County and the northern parts of Johns Creek in Fulton County. While in the legislature he was Vice Chair of the Education Committee and was also very involved in energy and budget issues. Mike and his wife, Lori, have three boys and recently became foster parents to two young sisters. Mike has a passion for youth and public service and is very active in the community.

Registration required by March 20 at bit.ly/ScienceTALKMar2017

The ScienceTALK lecture series focuses on business in science and mathematics.
The National Science Foundation (NSF) has awarded Kennesaw State University two grants totaling $900,000 to improve minority participation and success in undergraduate and graduate science, technology, engineering and mathematics (STEM) degree programs.

Kennesaw State’s share is part of a $4 million grant over the next five years to fund a University of Georgia-directed project, “Peach State LSAMP – Extending the STEM Pipeline in the Peach State: Mentorship, Research and Graduate School.” The NSF grant provides students with mentors, research opportunities and financial aid.

Each of Kennesaw State’s campuses will receive $450,000 to implement program activities and initiatives.

“Thanks to this NSF grant, Kennesaw State can continue its comprehensive and integrated series of recruitment and retention initiatives that address key transition points from undergraduate recruitment through preparation for graduate school,” said Adrian Epps, associate dean for external affairs and associate professor of educational leadership. Epps served as the principal investigator on the grant.

When the Peach State Louis Stokes Alliance for Minority Participation began in 2005, Kennesaw State’s Marietta Campus (formally SPSU) was one of the original members. Kennesaw State joined the Alliance in 2011. There are currently more than 50 LSAMP scholars at both campuses.

The Marietta Campus LSAMP effort is led by David Veazie, professor of mechanical engineering.

“The ultimate goal of the Peach State LSAMP Program is to encourage minority scholars to pursue graduate degrees in STEM fields,” said Veazie, Marietta Campus LSAMP director. “This NSF LSAMP grant will enable minority undergraduate students to conduct cutting-edge research at an early stage of their education with top engineers and scientists in support of their applications to graduate schools.”

Minority enrollment in STEM fields at Kennesaw State has increased from 1,760 in 2011 to 2,944 in 2014. The number of Bachelor of Science degrees earned by underrepresented minorities in STEM has risen from 238 in 2011 to 1,368 in 2014.

The Kennesaw Campus LSAMP effort is led by Melanie Griffin, assistant professor of biology-microbiology and Kennesaw Campus LSAMP director; Huggins Msimanga, professor of chemistry; and Epps.

“An exciting aspect of this phase of the KSU program is the emphasis on the early engagement of LSAMP scholars in active research,” said Griffin. “We believe that the more and earlier in their academic career that we can get undergraduates ‘doing science,’ the more impact we can have on their overall retention in STEM, leading to a successful baccalaureate outcome.”
We invite you to join us in supporting the **John C. Salerno Legacy Campaign** in recognition of the first anniversary of the death of Dr. John C. Salerno, professor of Biology and Chemistry and Neel Distinguished Professor. Dr. Salerno was eminent in his field, authoring more than 200 scientific publications, including fundamental discoveries in spectroscopy and enzymology.

A memorial fund has been established to accept donations that will build a memorial to Dr. Salerno, helping to leave a lasting legacy of his significant contributions to his field, his students, and future generations of scientists. One such legacy will be the John C. Salerno Prize for Research Achievement, slated to be awarded Fall 2017.

We hope you will choose to support this effort in memory of our friend and esteemed colleague. To make a contribution, please visit [bit.ly/GivetoCSM](http://bit.ly/GivetoCSM) and choose “Salerno Memorial Fund” in the drop-down menu by “Gift Designation Choices.”

Thank you for your consideration!

Jonathan McMurry, Ph.D.  Carol Chrestensen, Ph.D.
Associate Vice President for Research  Associate Professor of Chemistry
Professor of Chemistry

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**Growing Education**

Student learning experiences are enhanced by contributions provided to the college to support our student scholarships; improve the margin of excellence; and support research endeavors and professorships to help Kennesaw State University provide a strong environment for recruitment and retention of promising faculty.

For philanthropic opportunities, contact the CSM Director of Development at giving@kennesaw.edu or visit giving.kennesaw.edu. To donate to the college, visit [bit.ly/GivetoCSM](http://bit.ly/GivetoCSM).