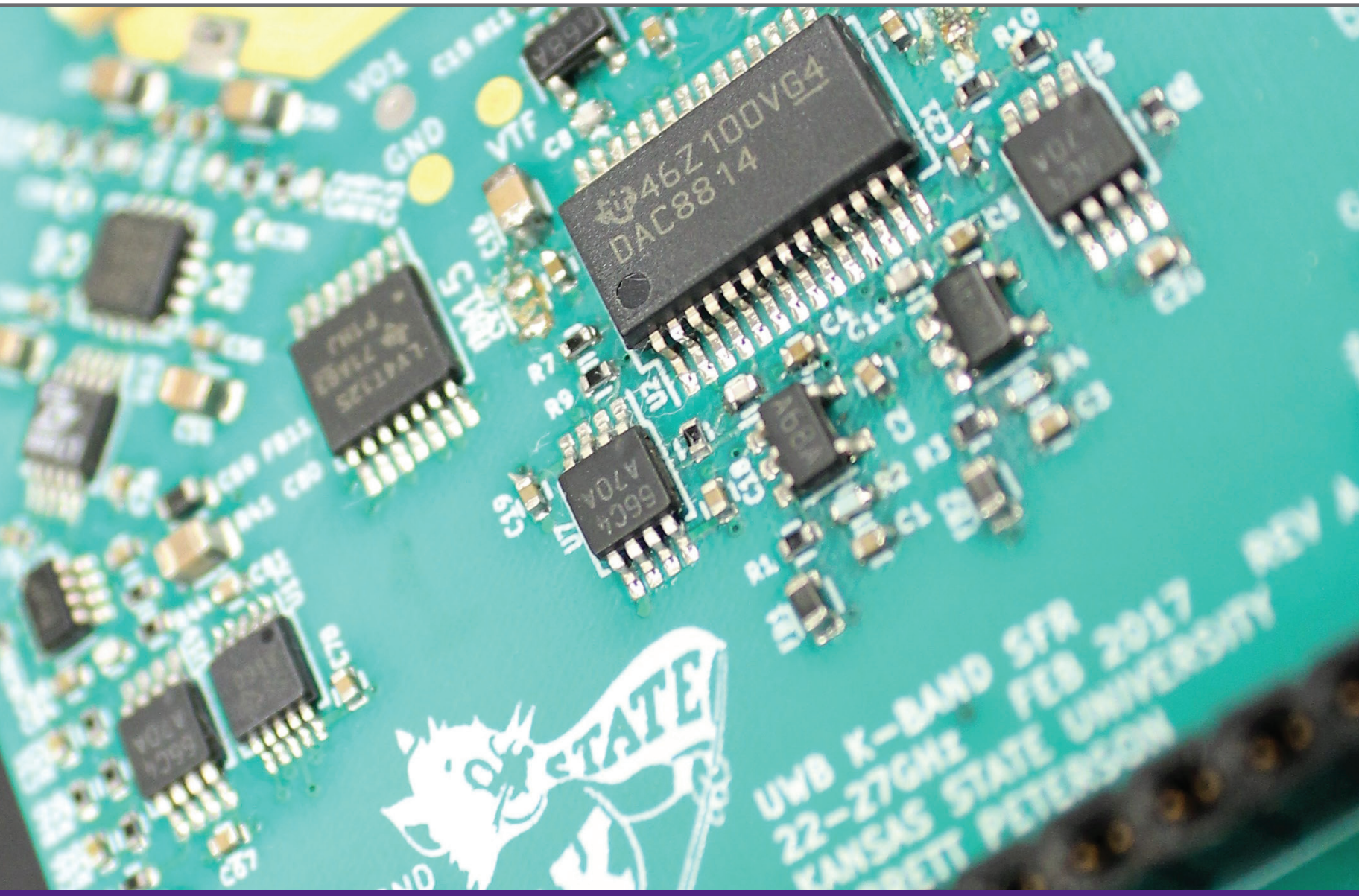
ECE UPLINK

ELECTRICAL AND COMPUTER ENGINEERING SUMMER 2018 COLLEGE OF ENGINEERING



KANSAS STATE UNIVERSITY

FROM THE DEPARTMENT HEAD

It is our pleasure to share with you the 2018 version of Uplink, our annual print newsletter from K-State electrical and computer engineering. We had another exciting and challenging year, with a lot of different activities and accomplishments. In October, we completed a highly successful accreditation visit from ABET. Both our computer engineering and electrical engineering undergraduate programs received highly favorable reports.

One of the exciting things going on throughout this year was the steady flow of prospective students who showed an interest in joining our new biomedical engineering program that will begin this coming fall semester. We are confident we will have a strong first BME class this fall while also maintaining stable growth in our computer engineering and electrical engineering programs. Currently, we are in the process of recruiting an additional faculty member to help with recruitment, advising and teaching for the BME program. This has also marked for a transition year for our senior design capstone experience, as it moved from a one- to a two-semester process. We have also begun the initial framework for a partnership program with industry members to support these important senior design experiences.

Activities on the research front include the beginning steps of forming an industry-university cooperative research center, called COMET, for on-the-move energy technologies. Professor Behrooz Mirafzal leads the center that will involve numerous other faculty from ECE and our college. Professor Punit Prakash also secured a large $1.3M grant from NIH for his work in microwave ablation of cancer tumors. Prakash was awarded tenure and promotion to associate professor this year as well.

You will see many other highlights of our students, faculty and alumni in this issue. We are very proud of the excellence these recognitions promote and would love to hear of other alumni accomplishments. Please let us know your recent news by sending a quick note to alumninews@ece.ksu.edu.

As always, please feel free to stop by the department the next time you are in Manhattan.

Go 'Cats!

Don M. Gruenbacher
Department Head
George J. and Alice D. Fiedler Distinguished Chair in
Electrical and Computer Engineering

INNOVATION & INSPIRATION
THE $1.4 BILLION CAMPAIGN FOR K-STATE

ECE UPLINK

ELECTRICAL AND COMPUTER ENGINEERING SUMMER 2018 COLLEGE OF ENGINEERING

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LEFT
WWP MEMBERS, JOEL PEGG AND TYLER KODANAZ, SET UP FOR COMPETITION. SEE PAGE 14.

ECE UPLINK

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RESEARCH OVERVIEW OF THE WORK OF SUNGO KIM

Professor Sungo Kim is currently working on atmospheric plasmas, plasma physics, plasma medicines, micro-plasma devices, plasma polymerizations, nanomaterials and artificial organs with graduate students and researchers. He is using various collaborations to produce outstanding research results with several professors at other universities and outside of the ECE department at Kansas State University.

Kim has published more than 170 peer-reviewed publications, delivered 35 plenary and invited talks, and holds 15 patents. He is a member of IEEE, Society of Information Display, American Vacuum Society, American Physical Society, AIAA and American Chemical Society. Kim frequently speaks to national and international audiences on various topics in the fields of plasma and nanomaterials. Summaries of the three fundamental research areas and his accomplishments in each follow.

Plasmas

Novel plasma physics

Kim has discovered novel, intense, highly energetic and high-density atmospheric pressure plasmas through the direct plasma jet-to-jet coupling effect. He is working on properties of focused atmospheric micro-plasma jet arrays with an emphasis on discharge dynamics, the interplay between adjacent plasmas in the array, and the interaction and effects that coupled plasmas have on the surface of various materials, biological surfaces and electric propulsion.

Plasma biomedical applications

Kim is leading the work on plasma cancer endoscopy for future cancer therapy. He and his team have taken an unprecedented cross-disciplinary approach to develop and characterize the plasma anti-cancer effect by direct plasma jet-to-jet coupling, atmospheric pressure plasma devices, and the development of endoscopic plasma cancer therapy that can greatly impact future plasma technology and many other bio-medical applications. He is also working on novel plasma endodontics and periodontics.

Plasma agriculture

This research uses plasma technologies to increase plant growth rate and yield, and cure plant diseases.

Plasma materials

Kim has developed unique plasma polymers and nanoparticles using a strong jet-to-jet coupled plasma phenomenon for lithium-ion batteries, implants and CO2 capture.

Flexible and directional plasma thrusters

This approach to propulsion provides many advantages over present technologies including being flexible, light, self-addressable, and directional, with high thrust, low power consumption, small size, fast response and long-lifetime.

Nanomaterials

Nanogenerators and piezotronics

Kim is currently developing high-functional ZnO nanostructures using hydrothermal synthesis for nanogenerators and piezotronics.

Printable, flexible, transparent and stretchable devices

This research on high-performing, printable, fully transparent, flexible and stretchable electronics can be integrated with flexible and low-cost polymer light-emitting displays.

Biomedical devices

Artificial organs

Kim is developing a novel bioartificial kidney using his unique ideas. The kidney will give ESRD patients new hope beyond the short-term solution of renal dialysis, and the longer-term, but impermanent, solution of a living kidney transplant for which donor organs are limited. He is looking for a funding opportunity and a financial donation for this project because it is a new topic in his group at K-State.

RESEARCH FOCUS MOHAMMAD SHADMAND

Mohammad Shadmand, ECE assistant professor and director of the Autonomous and Hybrid Energy Systems (AHES) Research Laboratory, investigates the fundamental engineering and scientific basis of electrical energy conversion. Under Shadmand's direction, the AHES lab focuses on the area of renewable energy systems — in particular photovoltaic systems, design and control of power electronics interfaces, power quality and grid resiliency.

The vision of the AHES lab is to propose an autonomous fleet of nanogrids to improve grid resiliency. Ultimately, the goal is to move photovoltaic energy out of the alternative energy category and into the mainstream portfolio of energy resources in a way that is technologically and economically sustainable. Shadmand and his team hope to be an internationally recognized research laboratory of excellence for research in this area.

Shadmand received his doctorate degree in electrical and computer engineering from Texas A&M University (TAMU), College Station, Texas, in 2015. Prior to joining K-State, he worked as a research engineer in a renewable energy and advanced power electronics research laboratory at TAMU from 2015-17. He has been published in more than 60 peer-reviewed journals, in conference proceedings and book chapters. He serves as principal investigator for a 1 MW, SiC-based, medium-voltage photovoltaic inverter project funded by the Qatar National Research Foundation for $4.7 million in collaboration with TAMU.

He is associate editor of the IET Renewable Power Generation Journal. He served as topic chair of the IEEE Energy Conversion Congress and Exposition (ECCE 2018) in Portland, Oregon, and has been a session chair for multiple conferences including the 2018 IEEE ECCE and 2017 IEEE TPEC. He has served as a technical reviewer of multiple IEEE transactions and conferences.

Shadmand was awarded second place in the IEEE Industrial Application Society Graduate Thesis Contest in 2013. He received the IEEE Standard Education award for the project "Fixed-step model predictive control of grid-tied photovoltaic inverter" in 2014. He was named a Michelle Munson-Serban Simu Keystone Research Scholar at K-State in 2017. He is a faculty member for the proposed NSF Center for On-the-Move Energy Technologies, or COMET.

ECE ALUMNI
HONORED FOR CAREER SUCCESS

The Kansas State University College of Engineering honored 10 alumni for professional career accomplishment during the first 20 years following their graduation at ceremonies April 21.

Recipients of the college's Professional Progress Award were nominated by their respective department heads and confirmed by Darren Dawson, dean of engineering.

The following are the 2018 Professional Progress Award honorees from ECE.

KIEFFABER

Jason Kieffaber, Louisburg, Kansas, is a 2004 graduate of Kansas State University in electrical and computer engineering. He also has a master's degree in engineering management from the University of Kansas. He has recently accepted a role as a technical program manager with SpaceX in Los Angeles, where he will be responsible for coordinating and managing various engineering groups developing the Falcon 9, Dragon and Falcon Heavy rocket engine platforms. He has worked for United Technologies as a senior engineering manager for the Airbus A350 electronic thrust reverser system in London before moving to Amazon in Seattle as a technical program manager for the Kindle Advertising Products group and, most recently, the Amazon Assistant mobile application. He also has been an engineering manager for Telephonics in New York on the U.S. Air Force AWACS Interrogator Program.

SCHRICK

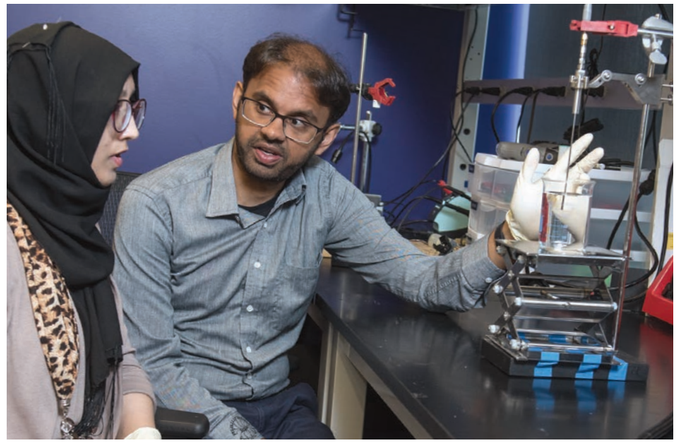
Joe Schrick, Olathe, Kansas, is a 1998 graduate of Kansas State University in electrical engineering. He is vice president of Garmin International Inc. fitness segments located at its U.S. headquarters in Olathe. His responsibilities include leading the fitness segment engineering team with more than 400 worldwide team members, providing strategic guidance for product road maps, and managing profit and loss for the $800 million business. For the past 19 years, Schrick has worked for Garmin in various roles, including design engineer, team leader, director of engineering for the outdoor and fitness teams, and business segment leader for outdoor and fitness. He successfully led the company into many new outdoor and fitness markets, including golf, dog tracking and training, action cameras and most recently, wellness.

NATIONAL INSTITUTES OF HEALTH FUNDS CANCER-RELATED RESEARCH

Tackling lung cancer with development of a minimally invasive treatment option is the goal of researchers from the Kansas State University colleges of Engineering and Veterinary Medicine, along with industry partner, Broncus Medical, San Jose, California.

The project, funded by a $1,321,648 grant from the National Institutes of Health's National Cancer Institute, is expected to lead to a bronchoscopic microwave ablation system for treating lung tumors.

Punit Prakash, associate professor of electrical and computer engineering, is principal investigator for the five-year study "Bronchoscope-Guided Microwave Ablation of Early-Stage Lung Tumors," awarded under the NIH Academic-Industrial Partnerships to Translate and Validate in Vivo Cancer Imaging Systems program.



LEFT, ECE PH.D. STUDENT, GHINA ZIA, AND PUNIT PRAKASH TAKE MEASUREMENTS WITH A DIELECTRIC CHARACTERIZATION PROBE.

"We will develop flexible, microwave ablation devices with precise control of microwave radiation that can be delivered to lung tumors via a bronchoscope," Prakash said. "These devices will be integrated with a computerized image-guidance, navigation and treatment planning platform to guide physicians in the optimal approach for treating the targeted tumors while preserving healthy tissue.

"We will evaluate the technical feasibility and safety of the proposed technique for treating lung tumors in a pilot clinical study," he said.

Kansas State University co-investigators on the project are from the College of Veterinary Medicine: Warren Beard and David Biller, both professors of clinical sciences, and Chanran Ganta, clinical assistant professor in diagnostic medicine and pathobiology.

Yixun Liu, principal imaging research and development engineer with Broncus Medical — a commercial-stage company that delivers navigation, and diagnostic and therapeutic technologies to treat patients with lung disease — represents the industry partnership on the project.

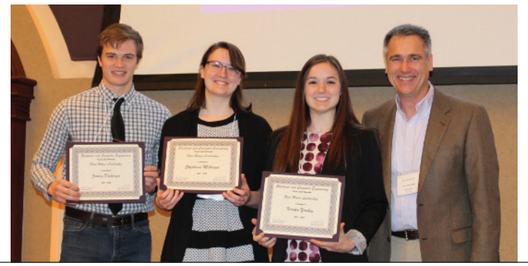
This project will support an interdisciplinary team of faculty, postdoctoral scholars and graduate students conducting cutting-edge research on microwave technology for therapeutic applications and their translation to the clinical setting.

This grant builds upon an earlier project from 2016-17 between Broncus Medical and the electrical and computer engineering department. Prakash was also the principal investigator. Technology products in that study led to novel bronchoscopic deliveries of microwave energy for treating lung tumors, resulting in patent filings by the Kansas State University Research Foundation. The research foundation and the Kansas State University Institute for Commercialization are working with Broncus Medical to develop strategies to further protect and commercialize the intellectual property resulting from the previous project and this new grant.

DEPARTMENTAL AWARDS BANQUETS

ECE hosted two awards banquets during the academic year, one in October and one in April. The awards banquet had been in the fall for the last five years but the department decided to make a change since many awards are presented to seniors. Having the event in the spring enabled seniors to attend and accept their awards.

The fall banquet was held on Friday, Oct. 21, 2017, and the spring banquet Tuesday, April 24, 2018, both at the Alumni Center. Students, faculty, staff and alumni attended, and several were recognized for their outstanding performances during their prospective academic years. Undergraduate award recipients receive monetary awards as well: freshmen receive $100, sophomores $200, juniors $300 and seniors $400. The funds are transferred into the students' KSIS accounts to help toward tuition and fees. The foundation funds used for these awards are a generous donation from Richard Dean Reeves. Others wishing to contribute, can contact the ECE office at 785-532-5600.



ECE DEPARTMENT ANNOUNCES FOUR RECENT FACULTY RETIREMENTS

Ruth A. Geis Dyer

Professor Ruth A. Geis Dyer is retiring July 31, 2018, from K-State after 35 years of teaching, research and administrative service in the areas of engineering, data analysis, policies and procedures, and academic affairs. She received a B.S. in biochemistry in 1973, and an M.S. in biochemistry in 1975, both from Kansas State University; and a Ph.D. in mechanical engineering in 1980 from the University of Kentucky.

Dyer joined Kansas State in July 1983 as an assistant professor in electrical engineering, at that time the only female faculty member in the College of Engineering with a Ph.D. in engineering. She was promoted to associate professor in 1989, and later, in 1997, to professor. She moved into administration in 2000 and has held the positions of assistant provost, associate provost, interim provost and—for the past eight years—senior vice provost for academic affairs.

As a faculty member, she taught courses in bioengineering, computer engineering, control systems, digital signal processing and linear systems. She received, among other awards, the James L. Hollis Award for Excellence in Undergraduate Teaching, in 1996. Her interdisciplinary research was in biological control systems, digital signal processing and spectrometry.

Dyer has done much to advance women and girls in the STEM disciplines. She created the program, Girls Researching Our World (GROW), which provides outreach activities for girls in middle school to encourage and increase their interest in STEM. She was principal investigator on the $3.5 million National Science Foundation ADVANCE grant to help transform the institutional culture at K-State with respect to women, and she created the K-State Advancement for Women in Science and Engineering office.

She has used her leadership skills in key university initiatives, including the KSU mentoring program for women and minorities in the sciences and engineering, the NCAA third-cycle certification process, the campus master plan update task force, the university climate survey committee and the north campus corridor master plan task force.

Internationally recognized for her work in engineering, she was named a fellow of the Association of Women in Science in 2006 and a fellow of the IEEE in 2008. In 2013, Dyer was inducted into the College of Engineering's hall of distinction at the University of Kentucky and she currently serves on that university's engineering dean's advisory council.

Since 1986, Dyer has served in numerous leadership roles in the IEEE Instrumentation and Measurement (I&M) Society, and is currently the junior past president of the I&M Society and is the recipient of the IEEE I&M Society's 2011 Distinguished Service Award.

Stephen A. "Jack" Dyer

Professor Stephen A. Dyer is retiring July 31, 2018, with more than 35 years of service in electrical and computer engineering at K-State.

Dyer received a B.S. in physics in 1973, an M.S. in electrical engineering in 1974, and a Ph.D. in engineering in 1977, all from Kansas State University. His teaching experience at K-State began early. He was an instructor for Circuit Theory I

ECE FACULTY RETIREMENTS

during his junior-senior year. Later, he held an appointment as a temporary instructor, with teaching duties in electrical engineering and research duties in biochemistry. From 1975-78, he held faculty positions in mathematics and physics at Georgetown College, and from 1978-83, in electrical engineering at the University of Kentucky.

Steve and Ruth Dyer returned to K-State in 1983, both having accepted faculty positions in the department of electrical engineering. Steve was promoted to associate professor in 1985, and to professor in 1989. In the mid-1980s, he was involved in the formation of and was instrumental in developing the curriculum for, the department's second program, the B.S. in computer engineering. From January 1987 through the summer of 1989, he served as associate head of electrical and computer engineering.

During his academic career, Dyer has taught more than 80 different courses in electrical and computer engineering, physics, mathematics, entrepreneurship and music. In addition, he has taught segments of courses in physical chemistry, aerodynamics, flight dynamics, anatomy and physiology, and creative problem-solving. Most of his research has been in instrumentation, spectrometry, signal processing and engineering education. A licensed professional engineer in Kentucky and Kansas, he has acted as a consultant, mainly in engineering forensics and product design, to more than 40 clients on more than 50 cases and projects, drawing illustrative examples for his courses from much of that work.

Dyer has provided longstanding voluntary service to the engineering profession, and has held several offices and editorships. He served three terms as president of the IEEE Instrumentation and Measurement (I&M) Society, and is currently vice president of publications for the IEEE Systems Council. He served three stints as editor-in-chief of the IEEE Transactions on Instrumentation and Measurement, and is the founding editor-in-chief of the IEEE Instrumentation & Measurement Magazine. He served two terms as an editor of the IEEE Micro Magazine, and is a member of the editorial board of Wiley & Sons' 24-volume Encyclopedia of Electrical and Electronics Engineering.

A life fellow of the IEEE, Dyer has been the recipient of several awards, including both the IEEE I&M Society's 2005 Distinguished Service Award and its 2009 I&M Career Excellence Award.

Ruth Douglas Miller

The College of Engineering recognizes Associate Professor Ruth Douglas Miller for 28 years of dedicated service at Kansas State University in the area of electrical engineering. She received a B.S. in electrical engineering in 1984 from Lafayette College, and an M.S. in EE in 1985 and a Ph.D. in 1990 from the University of Rochester.

Miller arrived at K-State in 1990 coincident with a rise nationally in concerns about adverse health effects connected to electric and magnetic fields from electric power equipment. She led an effort to quantify these fields near power lines and

electric substations across Kansas, and served as an in-state expert on the topic for inquiring citizens. She served 12 years on the IEEE EMBS committee on man and radiation, helping to write documents suitable for both the general public and professionals working near electric and magnetic fields.

In 2001, Miller began helping Professor Norm Dillman in advising the K-State Solar Car Racing Team; she became sole advisor in 2004 and continued assisting the team until it was disbanded in 2007. In 2006, she and Professor Todd Gabbard in architecture submitted and won the opportunity to develop a team to compete in the DOE Solar Decathlon in Washington, D.C., in fall 2007. Simultaneously with that effort she was asked by the National Renewable Energy Laboratory's Wind Powering America program to found the Kansas Wind Applications Center at K-State. She led the Kansas WAC from 2007 until this year and received awards in 2008, "Outstanding Leadership in the Application of Wind for Schools," and in 2014, "DOE Wind Exchange Outstanding Wind Leadership in Education," for her work helping Kansas schools install small wind turbines for education, as well as helping the national program develop and install hardware and software to track energy production data from more than 120 small turbines installed nationwide. She began and continues to advise the Wildcat Wind Power student design team, which has competed in all DOE Collegiate Wind Competitions since their inception in 2014.

For more than 28 years, Miller has taught countless students in electromagnetics, electronics, engineering ethics, and wind and solar energy. She has also spoken at schools and public venues across the state about renewable energy. She is a member of Tau Beta Pi and Eta Kappa Nu, and received the Erickson Public Service Award and Eta Kappa Nu Distinguished Faculty Award in 2017.

Medhat M. Morcos

The College of Engineering recognizes Professor Medhat M. Morcos for 32 years of dedicated service at Kansas State University in electrical engineering. He received a B.Sc. and M.Sc. in electrical engineering in 1966 and 1978, respectively, from Cairo University, Egypt; and a B.Sc. in military science in 1966 from the Egyptian Military Academy. Morcos earned his Ph.D. in electrical

engineering in 1984 from the University of Waterloo, Ontario, Canada.

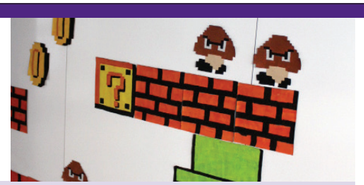
Morcos worked as an avionics engineer in the Egyptian Air Force for 15 years, retiring with the rank of Lt. Colonel in 1981. After receiving his doctorate, he was appointed to the faculty of the Egyptian Air Force Academy. He joined the department of electrical and computer engineering at Kansas State University in 1986 and is a member of the Institute of Electrical and Electronics Engineers, the American Society for Engineering Education and the Electrostatics Society of America.

Morcos held the Coffman Chair of University Distinguished Teaching Scholars during the 2001–02 academic year, and was nominated three times for the Carnegie Foundation U.S. Professor of the Year Award. His research interests include power electronics, power systems, electric machines, high-voltage engineering and power systems education. He has authored and co-authored more than 100 papers in refereed journals, and presented at scores of national and international conferences and workshops. He co-founded an exchange program for master's degree students between K-State and INPL in France, as well as the university's first distance master's program in engineering.

Morcos is the recipient of more than 20 awards in recognition of his exemplary teaching and advising including the Sanford Fleming Foundation Award-Canada, Eta Kappa Nu Distinguished Faculty Award, James L. Hollis Award for Excellence in Undergraduate Teaching, Phi Kappa Phi Scholar Award, Presidential Award for Excellence in Undergraduate Teaching, and the Dr. Ron and Rae Iman Outstanding Faculty Award for Teaching.

Morcos regards teaching as both a mission and a calling. Students have consistently remarked that he has the ability to make the most complex engineering concepts easier to understand, and how he goes beyond the subject matter to inspire and equip them for life. His greatest joy is to see his former students take their place in the world, not only as excellent engineers, but also compassionate human beings.

OPEN HOUSE 2018
BIG EFFORT, BIG PAYOFF FOR ECE



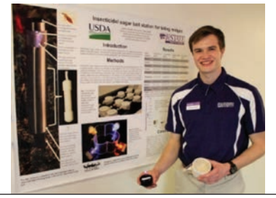
2018 Engineering Open House, "Engineer Your Own Adventure," began on Friday, April 6. The ECE department showed up in force with the theme of Mario Bros, performing a skit with a video game theme centered on Super Smash Bros. Jordan Disberger and Miranda Dodson acted as friends playing Super Smash Bros with Disberger's new controller, which turned out to be malfunctioning, but Dodson, being an ECE student, managed to fix it.

As part of Open House, ECE students submitted a wide range of projects from simple electronics to advanced engineering designs. These were put on display in the ECE department, showcasing each student's talent and passion. The displays were primarily undergraduate projects but also featured several graduate student entries. A select few of these projects were judged competitively in different categories.

Left, **Graduate Student Display:** Charles Carlson, graduate student in electrical engineering with an emphasis in biomedical engineering, presented his project, Biometric Sensor, featuring a chair observers could sit in and view several biometric signals monitored by the chair.

Left, **Curriculum and Careers Display:** Cierra Cowley created an informational curriculum display highlighting the ECE curriculum, and showcasing various classes for both electrical and computer engineering.

Below left, **Innovation Display:** Jordan Disberger, junior in electrical engineering and an Open House chair, shared his Open House project, Mosquito Trap Research, which featured different wavelengths of light to attract insects and measure various insecticides' effectiveness.



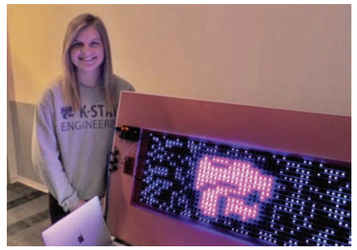
Technical Display: William Lies' technical display featured a large LED cube he designed and built. The cube was constructed from almost 2,000 LEDs and was 12 x 12 x 12 in size. It had multiple colored displays and multiplexing functionality.

Left, **Arcade Cabinet:** Seth Simonton, senior in ECE, created his own retro arcade cabinet featuring multiple games that could be played, as well as several different types of inputs. The project involved an impressive array of electronics all stored in a sleek arcade cabinet, perfect for old-fashioned gaming.

Children's Display: For the children's display, Trey Schmidt designed and featured two remote-controlled cars with the Rocket League video game theme. The display was functional, and included two cars and the game field.

Atrium Display: The atrium display, The History of Gaming, was designed by Stephanie Milberger and showcased information about older video games. Her focus was information and fun facts about where video games came from and how they work, especially the hardware of the games and how skills learned in ECE are used in their development.

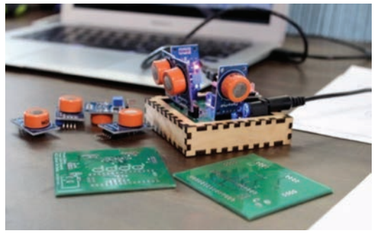
Locked Room: The ECE locked room was designed by Jordan Disberger and featured several challenges — centered on common electrical engineering tasks — to escape a room. Once in the room, participants could watch a video, recorded and edited by Disberger and his friends, explaining things about engineering and giving clues to occupants on how to escape.



Above, **LED Board Display:** Meagan Bruckner, junior in ECE, designed a large LED board featuring multiple LED strips controlled by an Arduino with programmable functionality. This allowed the board to display words and several different patterns such as a Powercat.

OPEN HOUSE AWARDS

Open House Leadership: **Stephanie Milberger, Jordan Disberger, Kristin Yankey**
Outstanding ECE Display: **Seth Simonton,** Arcade Cabinet
Curriculum and Careers Display — 2nd place: **Cierra Cowley**
Graduate Display — 1st place: **Charles Carlson,** Biometric Sensors
Innovation Display — 2nd place: **Jordan Disberger,** Mosquito Trap
Outstanding Student Organization — 2nd place: **Wildcat Wind Power**
Ultimate Display Award — 1st place: **Stephanie Milberger**



Above, **Alcohol Sensor:** Miranda Dodson designed a multi-sensor alcohol detector featuring individually calibrated and monitored MQ3 sensors. The design included a multilayered, printed circuit board with surface-mounted components.

Above right, **Marching Band Hats** ***(ECE 590 project co-op with the marching band):*** Connor Perrine, senior in ECE, worked as the team lead on a two-year collaboration with the K-State marching band to create the project featured in this display. It consisted of a wireless LED system connected to KSU marching band hats. The system was wirelessly synchronized with the music of the marching band to flash the LEDs in time with the music.

"Open House this year was an amazing experience. Although hectic and chaotic, being able to work with other ECE students was fantastic. I met many people in my department who had also volunteered, and we bonded over cutting out paper and painting," said Stephanie Milberger, ECE sophomore.

"Seeing the entire department decked out as a Super Mario game level was one of the best feelings in the world when all our work paid off," she said. "Another favorite part was seeing everyone not only enjoy the decorations, but have a blast on the scavenger hunt. People of all ages were searching for Pokémon and I'm really happy that although we can't catch them in real life, we could at least imitate the experience of letting everyone capture his or her own Pokémon."

LOOKING BACK, *WIND POWER TEAM* REPORTS A STRONG YEAR

Wildcat Wind Power (WWP) is a student design team that competes in the annual Collegiate Wind Competition put on by the National Renewable Energies Lab. Each year the competition identifies a new challenge and set of activities to address real-world research questions, thus demonstrating skills students will need working in the wind or wider energy industry. The Collegiate Wind Competition 2018 challenged interdisciplinary teams of undergraduate students from a variety of programs to offer a unique solution to a complex wind energy project involving wind turbine, and construction and wind farm design, and addressing the business aspects of renewable energy. This provided each student with real-world experience as they prepared to enter the wind industry workforce.

Justice Catron and Sam Pint, a freshman and junior in mechanical and nuclear engineering, respectively, anchored the wind farm-siting portion of WWP. K-State's wind farm design produced the most efficient design of the teams in the competition, which translated into its farm producing power at the lowest rate of dollars per kilowatt-hour. K-State's turbine design received compliments for its sleekness, simplicity and superior performance in passively tracking the yawing wind while under test. William Brownlee and Tyler Kodanaz, senior and sophomore in electrical and computer engineering, respectively, led the electrical portion of the team. The mechanical team consisted of Joel Pegg, Jacob McAfee, Jackson Jennings,

FRONT ROW, FROM LEFT, SAMUEL PINT, JACOB MCAFEE, TYLER KODANAZ, JOEL PEGG AND PROFESSOR WARREN WHITE. SECOND ROW, FROM LEFT, PROFESSOR RUTH MILLER, JUSTICE CATRON, JACOB MEYER, JACKSON JENNINGS AND ANDREW RIESCHICK.BACK ROW, FROM LEFT MILAN KLEMPAY, SIMON CIBULKA, WILL BROWNLEE AND SAM WILSON.

Giselle Guanes-Melgarejo, and Matt Bryan, all seniors in mechanical and nuclear engineering. Their combined efforts on the turbine and control circuit performed well, especially during the durability test where the team received the largest portion of its points. The leadership provided by Jake Meyer, president of WWP and senior in industrial and manufacturing systems engineering, facilitated an organized effort and closely focused the team's attention on the important tasks. Meyer also spearheaded the business portion of the competition.

Going into the 2017-18 school year, WWP went through some serious changes. The team found itself in a new room with many new faces. With few returning members from previous years, this team experienced some serious growing pains coming out the gate. However, with a firm resolve to succeed and overcome, the team did exactly that. WWP prevailed and earned 3rd place overall at a competition. The team's main takeaway on the ride home was a renewed energy to improve going into next year's event.

ECE GRADUATES

Ph.D. graduates

December 2017

Jacob Michael Lamb – Mirafzal
Dissertation: *Corrective schemes for internal and external abnormalities in cascaded multilevel inverters*

Xin Li – Gruenbacher and Scoglio
Dissertation: *Enhancing network robustness using software-defined networking*

Heman Shakeri – Scoglio
Dissertation: *Complex network analysis using modulus of families and walks*

Haotian Wu – Gruenbacher and Scoglio
Dissertation: *OpenFlow-enabled dynamic DMZ for local networks*

M.S. graduates

December 2017

Omar J. M. A. Alhouli
Jianwei Cui
Tianyu Lin
Henry Sarmiento Perez
Md Mahbubul Huq Riad
Todd William Rider
Nicholas Sean Rome
Jordan R. Thompson
James Joseph Zemzicki
Ryan Michael Zimmerman

May 2018

Pallab Kumar Datta
Travis Lyle Hancock
Nikhil Venkata Ravi Raja Mallala
Austin Alan Pfannenstiel
Khalil Ahmad Rafee
Andrew Ryan Staata
Austin Wesley White

B.S. graduates

December 2017

Kyle Conrad Brown, *Overland Park*
Hunter James Dellere, *Wichita*
Brandon Robert Dunn, *Manhattan*
Benjamin Denis Elsbernd, *Topeka*
Johan Ferguson, *Carlisle, Pennsylvania*
Chad Westin Gobber, *Hutchinson*
Tyler James Hinnen, *Shawnee*
Cooper Douglas Hoefling, *Wichita*
Michael Joseph Hortujac, *Overland Park*
He Huang, *Shanghai, China*
Nicholas Raymond Mannoni, *Shawnee*
Denton Kansas McAdam, *Belle Plaine*
Haley Bryce McElyea, *Overland Park*
Tyler Justin O'Briant, *Tonganoxie*
Noor Abdirashid Omar, *Olathe*
Jose Paul, *Topeka*
Jason Keegan Reilly, *Salina*
Mark Hofmeister Ronning, *Prairie Village*
Samuel William Rozell, *Manhattan*
Dylan Roy Shallberg, *Lakin*
Paul Winston Cabrera Suson, *Junction City*
Wesley C. Thomas, *Wichita*
Phillip Ross Urban, *Salina*
Dan W. Wagner, *El Dorado*
Chao Wang, *Chongqing, China*
Weiyuan Xu, *Shanghai, China*
Zaihui Zhong, *Chengdu, China*

May 2018

Carly Rose Benjamin, *Kansas City*
Braden S. Brown, *Kansas City*
Alan Timothy Caro, *Satanta*
Brett Christianson, *Shawnee*
Aaron Delzeit, *Dodge City*
Katie Joann Dhuyvetter, *Manhattan*
Mallory Kate Droge, *Olathe*
Mitchell Thomas Easley, *Olathe*
Samuel Louis Eichorst, *Olathe*
Grant Leslie Fruechting, *Newton*
Brady Norman Gooch, *Kansas City*
Thomas Gorham, *Overland Park*
Tanner Reid Griffin, *Lenexa*
Luke Ryan Haney, *Ulysses*
Braden Walker Heid, *Caney*
Samuel Robert Heryford, *Berryton*
Brandt Larson Hill, *Lenexa*
Shane Andrew Hollenbeck, *Topeka*
Nathaniel Winfield Jones, *Louisburg*
James Brandon Keeler, *Hutchinson*
Cameron Shelby Kennedy, *Basehor*
Daniel Jackson Lovell, *Olathe*
Damian Loya, *Dodge City*
Edwin Mast, *Hutchinson*
Andrew Eugene McKittrick, *Mission Hills*
Israel Mendoza, *Ulysses*
Bristol Nichole Miller, *Overland Park*
Brett Robert Nurnberg, *Assaria*
Jacob Aaron Offermann, *Topeka*
Sergio Ortiz Miranda, *Kansas City, Missouri*
Conner Stephen Perrine, *Olathe*
Nathan Thomas Rivers, *Mission*
Matthew Michael Rofrano, *Gloucester City, New Jersey*
Branden Lee Schneider, *Brentwood, California*
Steven Dusan Stancic, *Los Angeles, California*
Ethan James Stueve, *Olathe*
Alex Thibault, *Halstead*
Corey Daniel Vessar, *Warrensburg, Missouri*
Harold Glennon Vilander, *Emporia*
Shangxian Wang, *Hebei, China*
Qingbo Zhu, *Changehun, China*

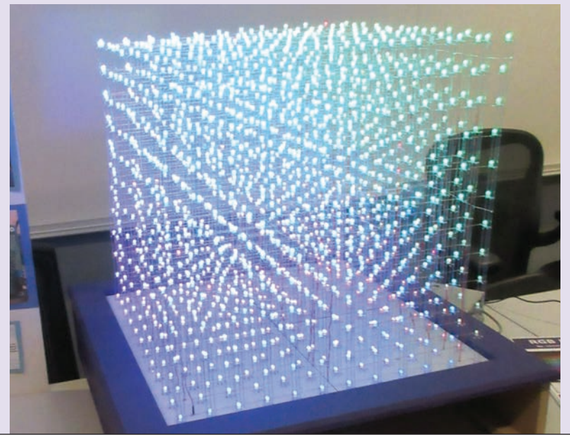
DEPARTMENT LAUNCHES INDUSTRY PARTNERSHIP OPPORTUNITY

ECE is establishing a new program this year that will create a partnership between the department and industry. Industry partners who join this subscription-based program will support projects in new, two-semester senior design courses while also gaining visibility in the department and among students.

The goal is to produce excellence in senior design project experiences that will help strengthen the quality of ECE's programs. These experiences should also strengthen recruitment and employment opportunities for students. Interested companies can contact the department for further information.

INDUSTRY ADVISORY COUNCIL MEMBERS TEST THE LED WALL, DESIGNED AND CREATED AS PART OF A SENIOR DESIGN PROJECT.

PROJECTS AND UPDATES MARK SUCCESSFUL CLUB YEAR



The Electronics Design Club has had another excellent year providing extracurricular lab resources and learning. Engineering Open House 2018 featured some of the club's most popular projects ever including an expanded LED cube led by William Lies and a full-sized arcade cabinet by Seth Simonton. The new 12x12x12 LED cube was a two-year club effort, and featured 1,728 RGB LEDs and more than 7,000 solder joints.

This summer will mark the second year of E-Club's new lab space, which continues to change as the club learns how to best serve the needs of our members. Additionally, members are currently in the process of upgrading their equipment, including 3D printers and test equipment to provide more workspace for expanded membership. The club is grateful to its donors who have made this possible.

BUSY YEAR FOR EMBS STUDENT CHAPTER

This year, the Kansas State University Student Chapter of the IEEE Engineering in Medicine and Biology Society (EMBS) updated, grew and increased the activity of the student organization. EMBS is a multidisciplinary organization with participants representing interests in engineering, biology, veterinary medicine, kinesiology, pre-health, gerontology, chemistry and various other disciplines.

This past year, EMBS sponsored multiple guest speakers from various colleges and departments. Carl Ade, kinesiology, presented "How Human Spaceflight Has, and Will, Advance Medicine." Larry Synder, veterinary medicine, presented "Stem Cell Therapy in Medicine." Tyrone Monroe, Hanger Prosthetics and Orthotics, visited campus and spoke about multiple aspects of his career as a prosthetist, bringing with him several examples of prosthetics he fits; and Adam Dear, Biosense Webster — a Johnson & Johnson subsidiary, presented a seminar hosted by EMBS.

HOJJAT FALLAHI, A PH.D. STUDENT WORKING FOR PROF. PUNIT PRAKASH IN THE BIOMEDICAL COMPUTING AND DEVICES LAB, HELPS A K-STATE OPEN HOUSE PARTICIPANT MEASURE HER ELECTROOCULOGRAM.

EMBS was also involved in numerous activities within and outside the College of Engineering. For E-Week, engineering students were able to learn about their EMG signal by using an EMG-based "strength indicator" designed by EMBS. EMBS also participated in a Girls Researching Our World (GROW) workshop organized by KAWSE. Middle school girls were able to learn about their EMG, BCG and ECG in the Medical Component Design Laboratory. For Open House, EMBS held a raffle for a space-themed package that included freeze-dried ice cream, a movie (The Martian) and Mars-themed socks. Individuals could enter upon the completion of four activities related to physiological monitoring. EMBS also volunteered for the Oxfam Hunger Banquet hosted by the grain science graduate student organization.

The student chapter also submitted a four-page paper titled "Activities to Invigorate a Student Chapter of the IEEE Engineering in Medicine and Biology Society" to the 40th International Conference of the IEEE Engineering in Medicine and Biology Society Conference that will be held in July 2018. The paper was accepted and several members of the executive team will attend the conference to present it. Additionally, the K-State Student Chapter of EMBS was awarded Engineering Student Council's "Most Outstanding Professional Student Chapter" to recognize the chapter's commitment to growth, member development, and overall outreach on campus and beyond. EMBS is proud of its accomplishments this year but has plans for more improvements in the upcoming year to foster further growth. It hopes to accomplish this by supporting more multidisciplinary cooperation and welcoming students in the new biomedical engineering major that will launch in August of 2018. For more information, contact the organization's adviser, Prof. Steve Warren, at swarren@k-state.edu.

UNDERGRADUATE STUDENT NEWS

Cody Deas, **Tim McCormick** and **Jordan Disberger,** all ECE, were inducted into the College of Engineering Steel Ring Honor Society.

Nick Mannoni, senior in ECE, received the IEEE Power & Energy Society Scholarship Plus Initiative Scholarship.

Damian Loya, senior in ECE, was crowned St. Patrick 2018.

Mitchell Easley, **Lukey Haney** and **Jose Paul**, all seniors in ECE, won best paper at the 2018 Institute of Electrical and Electronics Engineers Texas Power and Energy Conference.

UNDERGRADUATE STUDENT AWARDS

Outstanding seniors awards ($400 each)

- *Outstanding Academic Achievement*

  Fall 2017: **Weiyuan Wu**

  Spring 2018: **Brady Gooch**, **Braden Heid** and **Brett Nurnberg**

- *Outstanding Senior Leadership*

  Fall 2017: **Braden Heid**

  Spring 2018: **Damian Loya**

- *Outstanding Senior Service*

  Fall 2017: **Tyler Hinnen**

  Spring 2018: **Braden Heid**

- *Outstanding Senior Research*

  Fall 2017: **Daniel Clausing**

  Spring 2018: **Mitchell Easley**

GRADUATE STUDENT NEWS

Qihui Yang, ECE Ph.D. student, received the Robert I-Jen and Sophia Shui-Kan Jung Graduate Scholarship in Engineering.

Sifat Moon, ECE Ph.D. student, received a patent for previous work with Samsung on a collaborative drawing method and electronic devices.

Austin Pfannenstiel, ECE Ph.D. student, took 1st place in the Launch a Business program.

GRADUATE STUDENT AWARDS

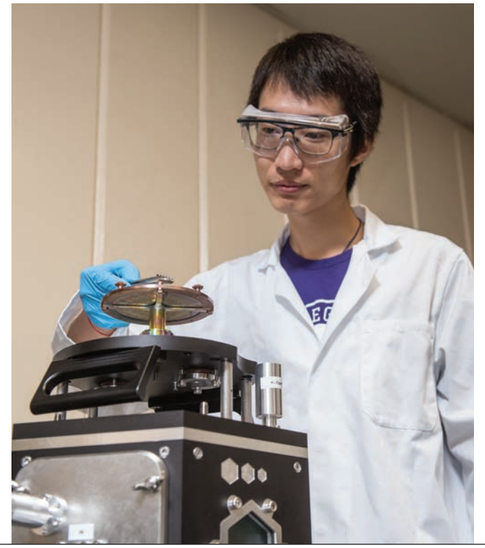
- *Outstanding Contributions in Graduate Research*

  Fall 2017: **M. Nazif Faqiry** and **Jacob Lamb**

  Spring 2018: **Kumarsinh Jhala**

- *Outstanding Contributions in Graduate Teaching*

  Spring 2018: **Mohsen Shid Pilehvar**



LI WANG, M.S. STUDENT, LOADS A SAMPLE INTO THE DS SPUTTERING MACHINE FOR METAL COATING.

WHAT HAVE YOU BEEN UP TO?

We would like to feature alumni news in future issues of ECE Uplink. Please send an email to alumninews@ece.ksu.edu with your latest news and accomplishments.

Interested in supporting the K-State electrical and computer engineering department? Learn more at ***give.evertrue.com/ksu/engineering***.

We sincerely thank you for all your generosity and support.

KANSAS STATE UNIVERSITY

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2018 ELECTRICAL AND COMPUTER ENGINEERING ADVISORY COUNCIL

Department faculty maintain extensive links to alumni and other industry personnel. These contacts keep program offerings current in order to provide the best possible match between our graduates and employers' needs. A formal ECE advisory council meets periodically to guarantee these goals are met. 2018 advisory council members are as follows:

Bob Beims
Mark Brown
Dan Burk
Dan Croft
Greg Deiter
William Dowling
Glen Fountain
Don Gemaehlich
Leslie R.E. Gordon
Don Gruenbacher
Gabe Hernandez
Mackenzie Martin
Ben McBride
Navin Nagiah
Jesse Schriner
Matt Spexarth
Jeff Thetge
Terry Weaver