

## CEC Education Outreach and Broader Impacts

The National Science Foundation (NSF) has a list of requirements for every proposal in its Proposal and Award Policies and Procedures Guide (PAPPG). These requirements include intellectual merit and broader impacts. The NSF CAREER program for young investigators requires an additional component of an education plan.

The College of Engineering and Computing offers established programs that faculty can integrate into their NSF CAREER proposals:

- **Undergraduate research** - Bring students into your lab but support them with the infrastructure of an established program for professional development and logistics.
- **Summer camps** - Serve as a presenter/expert to share your research with the campers brought in by the program, you don't have to run the whole program, just your small piece.
- **Partner with K-12 schools and teachers** - working with teachers will reach many students, as each teacher will pass along your research/topic to potentially 100's of students each year. Conferences and summer research experiences.
- **Industry- and design project-related programs** - provides career opportunities and experience for the students you engage.

*For more information about established programs in CEC and UofSC, please see the following links:*

## K-12 Outreach Programs

### [CEC Center for Engineering and Computing Education](#)

The Center for Engineering and Computing Education was established in 2018 with the mission to enhance engineering and computer science related education through rigorous and relevant hands-on content and programs. We seek to engage, empower, and inspire K-12 students in the study of STEM-related fields. The center supports interdisciplinary and collaborative approaches to developing critical thinking skills and solving complex problems. We offer learning opportunities for students, educators, and the community. We seek and maintain partnerships with individuals, schools, companies, and other organizations to achieve our mission. Together, we are igniting a fire for STEM education in South Carolina.

Contact: Krystal DuBose, Director of PreCollege Education, CEC, [kddubose@ced.sc.edu](mailto:kddubose@ced.sc.edu)

### **K-12 Community Events:**

#### [Daughter Date Night](#)

Middle school-aged girls are invited to apply for this FREE event, along with one adult as their "date." There will be time for our guests to collaborate, design and test a hands-on engineering activity. Guests will also be served dinner while they have the opportunity to chat with current women in the College of Engineering and Computing at UofSC.

Contact: Krystal DuBose, Director of PreCollege Education, CEC, [kddubose@ced.sc.edu](mailto:kddubose@ced.sc.edu)

## **Summer Camps for K-12 Students:**

### **Partners for Minorities in Engineering and Computing (PMECS)**

The Partners for Minorities in Engineering and Computer Science (PMECS) summer technical workshops are five-day programs focused on preparing high school students for success as future engineering and computing undergraduates. This partnership between educators and businesses provides gifted minority students with cultural and academic activities and role models in engineering and computer science. Through a series of technical workshops, students are exposed to the sciences, which helps enhance their academic skills. Rising high-school freshmen spend four days and three nights on the UofSC campus, and sophomores, juniors, and seniors spend six days and five nights on campus. College of Engineering and Computing personnel assist with the workshops.

Contact: Krystal DuBose, Director of PreCollege Education, CEC, [kddubose@ced.sc.edu](mailto:kddubose@ced.sc.edu)

### **Carolina Master Scholars Adventure Series**

The Carolina Master Scholars Adventure Series is a challenging, pre-university summer program for academically talented rising 6th through 12th graders. Students who successfully complete three or more Adventure Series courses earn the designation as Carolina Master Scholars.

Camps hosted at the College of Engineering and Computing include:

- Adventures in Vex Robotics
- Adventures in Engineering
- Adventures in Information Technology
- Adventures in 3D Printing
- Adventures in Computer Gaming
- Adventures in Machine Learning

Contact: [adventures@sc.edu](mailto:adventures@sc.edu) or call (803) 777-9444

## **Opportunities for Educators:**

### **LEAD Academy**

CEC's LEAD program is a free one-day experience held at our college designed to work in conjunction with the SC educational standards to provide students with hands-on experiences in a particular area of engineering and computing. Students will be engaged in hands-on project based learning, take a tour of UofSC, have lunch at the Russel House, and have time to talk with current CEC students.

Contact: Krystal DuBose, Director of PreCollege Education, CEC, [kddubose@ced.sc.edu](mailto:kddubose@ced.sc.edu)

### **Student Competitions**

Throughout the year, CEC hosts a variety of student competitions for middle and high school students.

Contact: Krystal DuBose, Director of PreCollege Education, CEC, [kddubose@ced.sc.edu](mailto:kddubose@ced.sc.edu)

### **K-12 Teacher Development**

Our center enhances and supports the professional growth of educators by providing hands-on content workshops. We believe that effective educators are lifelong learners, and that professional development is an ongoing process of enhancing our understanding of how children develop and learn, advancing our content knowledge and learning new practices.

Contact: Krystal DuBose, Director of PreCollege Education, CEC, [kddubose@ced.sc.edu](mailto:kddubose@ced.sc.edu)

### **Middle School Day**

The College of Engineering and Computing hosts an annual learning experience for sixth through eighth grade students. The middle school students spend the day engaging in various experiments and learning experiences with our faculty and students, learning about various fields of engineering and computing.

## **Student (Undergraduate and Graduate)**

### **Industry Partnerships**

Collaboration fuels innovation. At the UofSC College of Engineering and Computing, our researchers partner with private and public companies and other academics institutions to develop and improve technologies. Industry partnerships with UofSC CEC provide Capstone and Design projects, prepares graduates for the workforce, develops new technologies, provides scientific consultations to identify problems and research solutions, and improves economic development.

Contact: Danielle McElwain, Director of Research, CEC, [dmcelwai@cec.sc.edu](mailto:dmcelwai@cec.sc.edu)

### **McNair Junior Fellows (MJF) Program**

The McNAIR Junior Fellows (MJF) program is designed to enhance the career growth and development of undergraduate students through hands-on experiential learning, innovation, and research. The skills and knowledge that you gain by working closely with a faculty mentor is the type of experience that is highly desirable for employers and increases competitiveness for your future career.

Contact: Dr. Ramy Harik, MJF Program Director, CEC, [McNAIRFellows@sc.edu](mailto:McNAIRFellows@sc.edu)

### **Office of Undergraduate Research**

The university's Office of Undergraduate Research seeks to enrich the academic experience of all USC undergraduates by providing research and scholarly experiences in their chosen fields. The Office manages the **Magellan Scholar fellowship program** to support our talented undergraduates in a mentored research experience. It provides venues for undergraduates to present and publish their research. It also sponsors seminars for students to learn many of the skills necessary for becoming successful researchers. It also serves as UofSC's liaison for the **Louis Stokes South Carolina Alliance for Minority Participation (LS-SCAMP)**.

Contact: [our@sc.edu](mailto:our@sc.edu) or call (803) 777-1141

### **Trio-McNair Program**

UofSC has a long and successful history of mentoring underrepresented minorities in STEM research at the undergraduate level. The UofSC TRiO-McNair program is one such program on campus that provides scholarships, mentoring, and research opportunities for low-income or first-generation undergraduate students from universities around the state, including students from the UofSC.

Contact: Althea Counts, Director of UofSC Trio Programs, [countsa@mailbox.sc.edu](mailto:countsa@mailbox.sc.edu)

Contact: Dr. Jamil Khan, CEC, [khan@cec.sc.edu](mailto:khan@cec.sc.edu)

### **Grace Jordan McFadden Professors Program (GJMPP)**

The Grace Jordan McFadden Professors Program is a mentoring and support program established at UofSC in 1997 to promote attainment of the Ph.D. in all disciplines. Since inception, 52 students have completed doctoral degrees in the program, of which two-thirds are currently in academic teaching or administrative positions, with the remaining one-third in private industry. The success of this program provides valuable guidance as to best practices in retaining underrepresented minorities in doctoral programs. These best practices include regular meetings of all students, professional development workshops, invited speakers, networking with recent GJMPP graduates, and individualized mentoring by the director and senior staff.

Contact: Dr. John McFadden, Director, [jmcfadde@mailbox.sc.edu](mailto:jmcfadde@mailbox.sc.edu)

### **Rising Star Fellowship**

The Rising Star Fellowship strives to increase diversity in the graduate school ranks by recruiting students from South Carolina's Historically Black Colleges and Universities (HBCUs). Rising Star Fellows receive funding to offset the cost of tuition, health insurance and other associated fees.

Contact: Kesha Clavon, Senior Diversity Recruiter, [kesha@mailbox.sc.edu](mailto:kesha@mailbox.sc.edu)

### **National GEM Consortium**

The UofSC is a member of the National GEM Consortium and has successfully used the GEM program database of applicants to help identify and recruit minority students per year to campus. The GEM program seeks to enhance the value of the nation's human capital by increasing the participation of underrepresented groups at the master's and doctoral levels in engineering and science. The fellowship, in conjunction with the GEM graduate institution and GEM employer, provides a stipend, full tuition and fees, and a paid summer internship.

Contact: Dr. Mike Matthews, Associate Vice President for Research & CEC Senior Associate Dean for Research and Graduate Programs, [mamatthe@mailbox.sc.edu](mailto:mamatthe@mailbox.sc.edu)

## **Teaching and Writing**

### **Entering Mentoring Certificate**

The UofSC is a network institution in the NSF INCLUDES ASPIRE Alliance which promotes more inclusive teaching practices. The curriculum for "Entering Mentoring" helps faculty advisors become more effective research mentors for students with diverse backgrounds. This training is an evidence-based, interactive approach to becoming an effective mentor that will help develop the skills for engaging in productive, culturally responsive mentoring relationships, relationships that optimize success for the mentor and the mentee. UofSC is committed to and offers this training through its Center for Teaching Excellence. UofSC also offers "Entering Research" training for graduate students, of which is complementary to the "Entering Mentoring" and prepares graduate students to enter into the mentoring relationship.

### **Center for Teaching Excellence/ Teaching Resources**

At UofSC, the Center for Teaching Excellence's Teaching Resources provide valuable tools to help faculty with preparation, teaching, and course assessment. Examples of resources include accessibility, adapting large undergraduate courses, adapting courses for changing academic needs, active learning, a diversity, equity and inclusion toolbox, flipped learning, course design, development and delivery, and virtual environments.

## **National Resources**

ARIS – Advancing Research in Science  
(See handouts that are attached to email)

## **Assessment Resources for Broader Impacts**

(TBD)

Updated 2.3.2022 Devereux, Emily