A Multidisciplinary Collaborative GCSP
at George Mason University
Volgenau School of Engineering (VSE) and College of Science (COS)
George Mason University, Fairfax, VA 22030
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GEORGE MASON UNIVERSITY

The MASON IMPACT

Global Learning
Engaged Citizen
Civic Engagement
Undergraduate Research
Well-Rounded Scholar
Prepared to Act
Entrepreneurship

34,000 Students
There are more than 34,000 students on campus, creating an organically diverse environment.

130 Countries of Origin
Our student body represents more than 130 countries.

34,000 Students

Mason is a young university that, in just a short time, has made impressive strides in size, stature and influence. Today, as Virginia’s largest public research university, we are setting the benchmark for a bold, progressive education that serves the needs of our students and communities. To that end, we have 10 schools and colleges devoted to a variety of areas of study.

INTERDISCIPLINARY PATHWAYS

INTEGRATED CURRICULUM

TRANSFORMATIVE RESEARCH

STUDENTS AS SCHOLARS

The MASON IMPACT

The Mason Impact is an inquiry-based, challenge-driven learning experience inspired by real-world issues and challenges. By graduation, all Mason students will engage in a project-based experience that asks a question or creates a solution to a problem. The Mason Impact transforms the Mason Student into the Mason Graduate—an engaged citizen and well-rounded scholar who is prepared to act.

Student Learning Outcomes:

1. Students will understand how knowledge is generated and communicated, and how it can be used to address questions or problems in their disciplines and in society (Explore).
2. Students will be able to identify and negotiate multiple perspectives, work collaboratively within and across multiple social and environmental contexts, and engage ethically with their subject and with others (Collaborate/Apply).
3. Students will use inquiry skills to articulate a question, engage in an inquiry process, and evaluate the concepts, practices, or results within a broader context (Apply).
4. Students will design and carry out a project that asks an original question or seeks a creative solution to a problem, and offers a unique perspective. Projects are sensitive to contextual factors as well as ethical, logical, and cultural dimensions of a problem (Lead).
5. Students will communicate knowledge from an original or creative project through presentation, publication, or performance to an audience beyond the classroom (Lead).

Students Alex, Kathleen and Pradyuta from COS are interested in developing better technology built on scientific principles that can be used to stop poachers in action trying to kill elephants in Tanzania. They worked collaboratively on developing mathematical models under a design thinking framework for studying dynamics of quadcopters along with optimal control as well as new statistical algorithms to solve the associated search problem using a Bayesian framework with the objective of improving the decision as the search pattern continues through the evolution of a belief function. They are now interested in enhancing their work to create an intelligent sensor based tracking system working with researchers at the Nelson Mandela African Institute of Technology in Tanzania using tools from machine learning and computational mathematics.

GRAND CHALLENGES HIGH SCHOOL

The Global STEM (Science, Technology, Engineering, and Mathematics) Challenges Program (GCSP) is a three-year interdisciplinary program in which students engage in problem-based challenges connected to the real-world that are designed to teach concepts in mathematics, science, and engineering. Students enrolled in the program are part of a cohort that operates as a smaller learning community within Edison High School in the Fairfax County Public School District. They meet for three-period blocks every other day. Students approach problems holistically, in a real-world context, where different aspects of each discipline are interwoven and highly connected. Content for the course is aligned with the National Academy of Engineering’s Grand Challenges for Engineering. The GCSP was designed and supported in part through the High School Program Innovation grant from the Virginia Department of Education. With successful completion of the program, twelfth grade students will be able to choose advanced coursework in specific fields or pursue an IB diploma. A new group of students began the program in the 2017-18 school year.

MULTIDISCIPLINARY EXPERTISE

GCSP @ MASON

The GCSP program at Mason will focus on themes involving energy, health, security, STEM education and sustainability. The program will build on the MASON IMPACT framework that aligns well with the mission of GCSP. This joint initiative between the Volgenau School of Engineering and the College of Science at George Mason University will help to create a new interdisciplinary program for students each year who will have the opportunity:

• to perform multidisciplinary research in one of the selected Grand Challenge topics
• to engage in an integrated curriculum that gives them a holistic training
• to participate in service learning opportunities with partnering school districts
• to enhance their content knowledge through a global perspective
• to learn to become a successful entrepreneur and implement meaningful solutions.

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