

Shiley-Marcos School of Engineering

Inspiring Innovation



STEAM K-12 Studio: \$500,000

Background

The Shiley-Marcos School of Engineering is seeking \$500,000 to create a **STEAM K-12 studio**. Educators and policy makers are in general agreement that the teaching of STEM subjects at the K-12 level must be improved. To date, STEM teaching has primarily focused on science and mathematics. Although in recent years schools across the United States have started focusing on engineering and technology (which are the applications of science and math), these subjects are not nearly as common in the K-12 classrooms as they need to be — especially if the U.S. is to remain competitive in the global economy.

The Shiley-Marcos School of Engineering is seeking to create a STEAM K-12 studio as a space to develop lessons and techniques that bring together STEM disciplines and concepts, through creative hands-on projects and experiments.

STEAM adds the creative element of art (the A in STEAM) — through product design, language and communication and social studies — to the teaching of traditional STEM subjects, to make the learning more compelling and to connect it to real-world needs.

The studio will be used by K-12 teachers and students across San Diego County, along with USD faculty, staff, postdoctoral researchers, graduate and undergraduate research assistants, with a common goal of studying K-12 engineering education to create the most effective engineering learning experiences for K-12 students.

The STEAM K-12 studio will provide professional development opportunities for teachers seeking to incorporate active, hands-on STEAM learning into their K-12 classrooms. We are particularly interested in providing training for teachers who work in disadvantaged communities, as a way of addressing educational inequities.

Programs will be offered in the summer and on weekends, along with short-term workshops and longer certificate programs. In the long-term, the Shiley-Marcos School of Engineering envisions this studio as a nexus for all STEAM K-12 engineering education in the San Diego region.

Objectives

Faculty and students (undergraduate, graduate and post-doctoral) will be invited to use the STEAM K-12 Studio as a living laboratory in which to pursue research that advances the discovery of transformative approaches for preparing 21st century citizens and future generations of the global technological workforce. External grants will be pursued to help fund research initiatives and support the development of local, domestic and international STEAM programs and teacher training, particularly in communities underrepresented in STEM fields.

Enhancing the Student Experience

Faculty and students (undergraduate, graduate and post-doctoral) will be invited to use the K-12 STEAM studio as a living laboratory, in which to pursue research that advances the discovery of transformative approaches for preparing future generations of the global technological workforce. External grants will be pursued to help fund research initiatives and support the development of local, domestic and international STEAM programs and teacher training, particularly in communities underrepresented in STEM fields.

The STEAM K-12 studio will host after-school programs, particularly for students from disadvantaged schools. These programs are expected to heighten participants' awareness of the application of STEAM principles, while strengthening their STEAM competencies in alignment with Common Core and Next Generation Science Standards. These programs are also expected to enhance the pipeline of STEM-ready students, and encourage students' college aspirations,

retention in the STEM fields, and pursuits of STEM careers.

The STEAM K-12 studio will impact USD, and the San Diego region, in multiple ways by:

- Providing critical training for K-12 teachers throughout the county, who seek to incorporate engineering into their classrooms;
- Addressing educational inequities, by focusing on schools in disadvantaged communities;
- Hosting after-school programs for K-12 students, to foster interest in engineering careers; and
- Encouraging USD faculty and students to use the space for collaboration, research and training.

For More Information

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