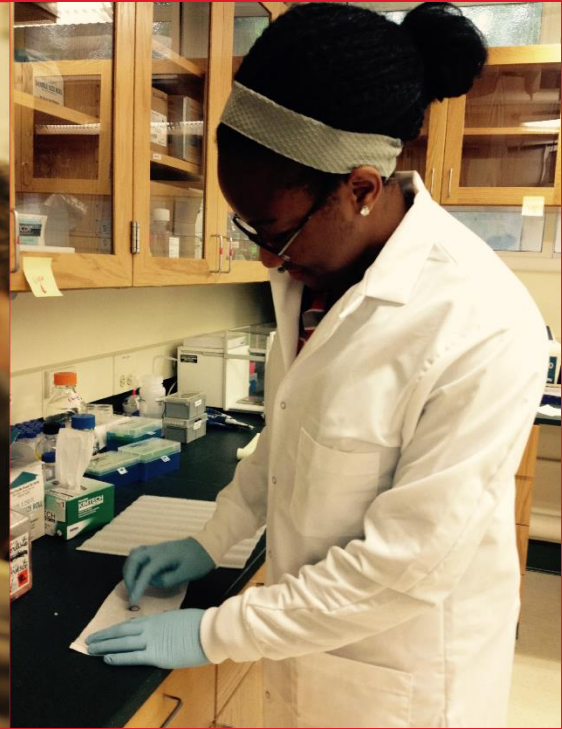


# Northeastern University

## *Center for STEM Education*

*Building a Legacy of STEM Engagement*



- ***Our Vision***
- *To build, support and sustain a community of individual, institutional and organizational support in STEM engagement, enrichment and persistence.*
- *To impact advancement in STEM education through expanded collaboration, mentoring and training to increase access and diversity in STEM.*
- *To increase student involvement with STEM subjects and careers by designing, implementing and supporting academic and extracurricular programs in STEM fields.*



### **MISSION**

*The Center for STEM Education at Northeastern University seeks to build and support a community of educators, researchers, and students with the collective goal of strengthening the K-20 STEM (Science, Technology, Engineering, and Mathematics) educational ecosystem.*

## BROADER IMPACT K-12 INITIATIVES

The Center for STEM Education works in collaboration with 50+ faculty and 75+ undergraduate and graduate student affiliates annually to design and deliver multiple Broader Impact efforts. These initiatives reach a diverse audience of students, providing day-long and multi-week STEM program experiences in addition to supporting and sustaining long-term relationships with those impacted by these program efforts.

**STEM Field Trips** are offered throughout the academic year for upper elementary and middle school students. Teachers bring their students to Northeastern's campus for a day of STEM lessons and activities, hosted by the Center. Assisted by our undergraduate and graduate students, these offerings provide an early college experience and engineering exploration. Approximately 1500 students annually spend a full day on our campus supported by a cohort of 75+ undergraduate students. Teachers overwhelmingly indicated their satisfaction with the field trip series, rating these events with an average rating of 9.33/10. When asked if they felt their students benefited from these activities teachers were very positive in their response (9.56/10). 100% of teachers would participate again.

**Engineering Explorations** is a one-week hands-on engineering program coinciding with National Engineers Week. Boston area 4<sup>th</sup>-6<sup>th</sup> grade students are able to participate in a variety of engineering activities, aimed at exploring and highlighting the many disciplines of engineering.

### Summer STEM Programs

The Center for STEM currently offers two summer programs for middle and high school students. We reach approximately 50 students annually through these initiatives and approximately 1200 students to date have participated in one of our summer program offerings:

**Northeastern University Summer STEM Program (NUSSP)** is a two-week academic day program that takes an active role in shaping STEM education in students entering grades 6, 7 and 8. It seeks to improve students' mathematics/science skills, introduce them to college life, and stimulate their interest in science and engineering as potential career paths.

**Young Scholars Program (YSP)** offers future scientists and engineers a unique opportunity for a hands-on, paid research experience while still in high school. The program is open to Boston area applicants who have completed their junior year of high school.

### One Day Events

The Center for STEM Education offers multiple one-day events to engage children and their families in STEM. Offerings include but are not limited to: Building Bridges for high school students, Engineering for Everyone Expo, and the BPS Science and Engineering Fair.

## CURRENT AFFILIATED GRANT EFFORTS

**Student Pathways Opening World Energy Resources (S-POWER)** is a five year NSF S-STEM initiative that seeks to increase workforce diversity in STEM fields and the energy sector. The program will provide transfer scholarships for up to 160 undergraduate and graduate students from Clark Atlanta University, Hampton University, Mass Bay, Middlesex and Northern Essex Community Colleges. (NSF #1564653, PI: B. Lehman; Co-PI: C. Duggan, R. Harris, M. Minus)

**REU-POWER** provides participating undergraduates with a 10-week summer experience working with professors from across the College of Engineering, engaged in research on topics pertaining to the National Academy of Engineering (NAE) Grand Energy Challenge. Topics of research cover a broad range of subjects, such as making solar energy more economical or creating energy from fusion, with a particular focus on transcending the barriers and overcoming the challenges to providing ample clean energy to citizens throughout the world. (NSF #1757650, PI: Lehman; EV: C. Duggan)

**REU-Data Driven Discovery** provides a multi-disciplinary research opportunity for rising sophomore undergraduates, offering an exciting 10-week summer experience in computer science/engineering laboratories. The program allows for work on both fundamental and applied data-driven problems, focused on machine learning techniques, data analytics, and computational technologies. (NSF #1559894, PI: D. Kaeli; EV: C. Duggan)

## PAST PROGRAMS

**TRANSFORM** was a Northeastern University and MassBay Community College collaboration to design and implement an innovative TRANSFORM model to retool the skill set of liberal arts college graduates to prepare them for careers in manufacturing. (NSF #1407160, PI: I. Zeid; Co-PI: C. Duggan, S. Kamarthi)

**Research Experiences for Teachers (RET)** was an opportunity for Secondary STEM teachers and Community College faculty to engage in collaborative inquiry with mentor faculty at Northeastern University. (NSF #0742924, PI: M. Silevitch; Co-PI: C. Duggan)

**CAPSULE** was a collaboration with the Museum of Science and the Boston Public Schools to develop a model for the integration and implementation of an engineering design project-based high school STEM curriculum within urban school districts. (NSF #0833636, PI: I. Zeid; Co-PI: C. Duggan, S. Kamarthi, A. Busnaina, J. Isaacs)

See film: *Hands-On, Minds-On: Bringing Engineering Design to High School Classrooms*

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