

Office of Engineering Outreach Programs

The [Office of Engineering Outreach Programs \(OEOB\)](#) in the School of Engineering runs academic enrichment programs that reach more than 350 middle and high school students locally and nationally each year. These programs are all offered free of charge and focus on exposing students to engaging and challenging curricula in engineering and science. Our goal is to provide traditionally underserved students with multiple entry points to academic and professional careers in the science, technology, engineering, and mathematics (STEM) disciplines.

OEOB's core programs—the Minority Introduction to Engineering and Science (MITES) Program; the Engineering Experience at MIT (E2@MIT) Program; the MIT Online Science, Technology, and Engineering Community (MOSTEC) Program; and the Saturday Engineering Enrichment and Discovery (SEED) Academy—also support MIT's mission to sponsor K–12 programs that foster unique learning experiences for students and help build a pipeline of diverse and highly qualified scientists and engineers.

Raising over 80% of its own funds, OEOB makes significant efforts to maintain its financial resources and support. In close cooperation with the dean of engineering and MIT development officers, OEOB secures funding for its programs from a broad range of corporations, foundations, MIT alumni, OEOB alumni, and other individuals.

Highlights

The table below shows the numbers of students served since 2007 in various OEOB programs.

Table 1. Students Served Since 2007

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SEED	85	94	93	92	90	95	90	95	89	123
MITES	64	66	70	71	80	80	78	72	68	80
MOSTEC	–	–	–	–	64	115	88	133	117	112
E2@MIT	–	–	–	–	64	76	76	107	91	72
STEM	80	84	78	89	93	86	85	86	94	–
Total	229	244	241	252	391	452	417	493	459	387

The following are some of OEOP's most notable achievements and highlights from AY2017:

- In 2016–2017, 228 students who had participated in OEOP programs were enrolled as undergraduates at MIT.
- Seventy-five students who applied to MIT from the 2016 MITES, MOSTEC, E2@MIT, and SEED Academy programs were accepted.
- In fall 2016, the 10th SEED Academy student was admitted to MIT.
- All of the students who graduated from the AY2017 SEED Academy were accepted into college.

Programs

Minority Introduction to Engineering and Science Program

MITES served 80 high school students from across the United States and Puerto Rico in 2016. Of these students, 50% were female, 88% were from racial or ethnic groups underrepresented in science and engineering (Black or African American, Hispanic or Latino, Native American, Pacific Islander), 47% would be the first in their families to attend college, and 49% qualified for free or reduced-price lunches.

MITES participants spent a rigorous 30–35 hours in classes and labs each week and received daily assignments. Students took physics, calculus, a humanities course, and a life science course (chemistry, biochemistry, or biology). Previous coursework and student interests were used to determine which classes each student completed. In addition, students participated in a hands-on enrichment course—digital design, engineering design, genomics, electronics, or architecture—three afternoons a week based on their interests and course availability.

Outside course study, students discussed career options with MIT faculty members, MIT graduate students, and practicing scientists and engineers. To obtain a better understanding of how to gain admittance to top schools such as MIT, students interacted with MIT admissions and financial aid officers at seminars and dinners and participated in a college fair with recruiters from approximately 25 universities. Participants also gained a better understanding of engineering fields through active participation in hands-on enrichment courses, seminars with leading scientists and engineers from academia and industry, and innovative design competitions.

Ninety-seven percent of the students who participated in the program in 2016 reported feeling more prepared to master the most difficult material in a course, 96% were more confident in their ability to manage unforeseen events, 95% believed that they were more able to collaborate effectively with others, and 91% felt more prepared to balance their academic coursework with outside obligations such as personal relationships, work, and extracurricular activities.

Following the program, 32 MITES students were admitted into MIT's class of 2021. Others are pursuing studies at prestigious institutions such as Harvard and Stanford.

Engineering Experience at MIT Program

In 2016, E2@MIT served 72 rising seniors from high schools all over the nation. Fifty percent of these students were female, 78% were from racial or ethnic groups underrepresented in science and engineering, 51% would be the first in their families to attend college, and 50% qualified for free or reduced-price lunches. The students were confronted with rigorous work in a project course that exposed them not only to engineering design but also to thinking processes essential across all engineering fields. Along with their courses, students attended five sessions with the MIT Admissions Office and received tours of MIT facilities and labs. They also attended a college panel and three career seminars.

The classes offered at E2@MIT provide students with a workload and learning curve comparable to those a first-year student would experience at a top-tier university such as MIT. Our goal is to boost the confidence and preparedness of each of our students, encouraging them to pursue higher education and a career in a STEM field. Projects were designed to be completed in one week's time, with approximately 20 hours of work in class and 10 hours of work out of class. Instructors were responsible for teaching the core principles of engineering and helping students navigate their way to reasonable problem solutions. Students worked together in small groups or as a class to learn the value of collaboration and sharing of ideas when solving problems. At the end of the course, students presented their work in an engineering showcase to their peers and instructors, describing in detail their approach to the problem, overall design process, and final solution.

Ninety-two percent of the 2016 student participants reported that they believed the program had given them the skills they need to successfully pursue their educational goals, 85% believed they were more able to remain calm when faced with difficult situations, 85% believed they were more able to collaborate with others, and 82% felt more prepared to master the skills taught in a course.

Twenty E2@MIT students were admitted to MIT's class of 2021.

MIT Online Science, Technology, and Engineering Community Program

MOSTEC served 116 students from across the United States in 2016. Of these students, 46% were female, 79% were from racial or ethnic groups underrepresented in science and engineering, 38% would be the first in their families to attend college, and 45% qualified for free or reduced-price lunches. During the academic phase of the program, which ran from July to August 2016, students completed online coursework and projects in science, engineering, and technical writing. The enrichment phase of the program ran from August to January. During this phase, students continued to learn about science and engineering by interacting with college faculty and staff and receiving online mentorship from undergraduate students, graduate students, and industry professionals. Students also had access to admissions and financial aid experts. Through this online community, students became part of a rich and exciting network of talented and motivated high school seniors.

Ninety-one percent of students who took part in MOSTEC in 2016 reported feeling more able to collaborate with others, 89% felt they were better able to find solutions to

unfamiliar problems, 86% felt better able to master the most difficult material in their college courses, 83% felt they were more able to stick to their goals, and 84% felt better able to ask questions clarifying the thoughts and opinions of others.

Twenty-two MOSTEC students were admitted to MIT's class of 2021.

Saturday Engineering Enrichment and Discovery Academy

SEED Academy served 123 talented students during AY2017; 57% were female, 59% were from racial or ethnic groups underrepresented in science and engineering, 39% would be the first in their families to attend college, and 65% qualified for free or reduced-price lunches. Participating students attended public schools in Boston, Cambridge, and Lawrence, MA.

SEED Academy students came to MIT for 16 Saturdays to take courses based on their grade level. Each course involved a different technical discipline, such as civil engineering, computer science, or electronics. All students also completed an academic mentoring seminar that focused on leadership, character education, socio-emotional skill building, academic achievement, college and career access, and community action. Beyond the classroom, participants engaged in a weekly lunch seminar and visited Brown University, the Worcester Polytechnic Institute, and the Franklin W. Olin College of Engineering. Students increased their mastery of academic subjects through practical application of math and science concepts and exposure to a university environment.

In 2016–2017, the SEED Academy graduated a class of 25 students who were accepted to a number of prestigious universities, including MIT, the Olin College of Engineering, Dartmouth College, McGill University, the Wentworth Institute of Technology, Northwestern University, Holy Cross, Boston College, Brandeis University, Bryn Mawr College, Lesley University, Loyola College, Northeastern University, the University of Massachusetts Amherst, the University of Massachusetts Lowell, and the University of Massachusetts Dartmouth.

Leadership Changes

OEOE experienced a change in leadership in 2016. In August 2016, Eboney Hearn '01 was named the program's executive director. Hearn previously served as assistant dean for graduate education and diversity initiatives in the Office of the Dean for Graduate Education (from 2014 to 2016) and as program director of the Broad Institute's diversity initiative (from 2008 to 2014). In both roles, she provided strategic direction and coordination to increase student diversity and academic success at all levels. Prior to coming to MIT, Hearn was a mathematics teacher at public middle and high schools in Boston and was a manufacturing engineer at IBM, where she led several manufacturing processes in circuit board printing and co-patented a novel photolithography process. Hearn received an SB in chemical engineering from MIT and an EdM from the Harvard Graduate School of Education.

Eboney Hearn
Executive Director