Bernard M. Gordon–MIT Engineering Leadership Program/ Undergraduate Practice Opportunities Program

Launched in 2008 through a $20 million gift from the Bernard M. Gordon Foundation (the largest gift made to MIT's School of Engineering for curriculum development), the Bernard M. Gordon–MIT Engineering Leadership Program (ELP) was established to educate and prepare future potential leaders of engineering innovation, invention, and implementation efforts. Designed for "The All," that is, all MIT engineering undergraduate students, ELP provides a transformative, national model to develop next-generation technical leaders who are equipped to understand and address significant engineering problems in real-world situations.

Two features make the program unique. These are:

- Comprehensiveness: The program has activities that run virtually from the time students arrive on campus through to the end of their senior year.
- Intra-Institute Engagement: The program engages all of the departments of engineering and even some of the applied sciences departments in the School of Science, many of whose graduates go on to create new technologies and services after completing their studies at MIT.

The Bernard M. Gordon–MIT Engineering Leadership Program for School of Engineering students begins with the Undergraduate Practice Opportunities Program (UPOP). UPOP is the primary prerequisite for admission to the selective program. Both UPOP and ELP provide students with practical, hands-on engineering leadership activities designed to develop in them the skills of leadership, social responsibility, and sensitivity to international cultural issues that will allow them to be both the "thought" leaders and the "do" leaders of the future.

During AY2010, the program's second year of operation, program codirectors professors Edward Crawley and Joel Schindall conceived and executed a program re-architecture that resulted in broadening the program's impact across the Institute. By the end of AY2010, UPOP and ELP directly impacted more than 480 students throughout the Institute, including 90 undergraduates in the program's selective offerings for "The Many" (a competitively chosen cohort of engineering juniors and seniors committed to honing their engineering leadership skills) and "The Few" (a cohort of Gordon Engineering Leaders who have successfully completed the first-year program requirements and elect to advance to the second year of the program).

Building Engineering Leaders

ELP faculty and staff conceived, planned, and executed numerous activities in AY2010 to help develop in MIT students key capabilities of engineering leaders. Program leadership hired subject-matter experts in engineering leadership education, project-based learning, and communications and outreach; these professionals worked together, and with significant input from leadership experts at MIT, industry, academia, and the military, to further define and codify program policies and procedures. Efforts to reach

out to parties both inside and outside the Institute helped to build, strengthen, and expand critical alliances.

Inside the Institute, program leadership brought together people in engineering, management, military science programs, religious programs, and dormitory and living-group-based programs, all of whom think about what makes leadership work. This group developed a collective vision to use and reinforce a common leadership lexicon so that students routinely hear the same vocabulary, ideas, and leadership capabilities from the president of MIT, from dormitory coaches and mentors, in ELP, and in other leadership programs.

Outside the Institute, program leadership commissioned several studies that benchmarked engineering leadership programs at academic institutions worldwide. Creative and aggressive program outreach disseminated these studies and served to raise the profile of this nascent field among academic, industrial, and political leaders. Augmenting the visibility of the program in numerous national and trade publications in an effort to position MIT as the "thought leader" in engineering leadership will continue during an inaugural engineering leadership meeting to be co-hosted by MIT and held at Penn State University in October 2010.

The restructuring of the program allowed for more student applications, resulting in 56 new students being admitted into the program for "The Many." This expansion complemented the 29 students already in the program for "The Few." UPOP also broadened its footprint throughout the Institute, reaching a record full-capacity enrollment of almost 300 students. To serve the increasing demand and help students meet formalized program completion requirements, program faculty and staff:

- Designed and ran two new short subjects: ESD.052 Project Engineering and ESD.950 Engineering Leadership
- Planned and executed two terms of engineering leadership labs
- Created new experiential learning modules for UPOP
- Increased participation of MIT alumni in teaching and mentoring UPOP students
- Delivered the Foundations of Engineering Leadership intensive make-up course in May 2010 for accepted ELP students who had not completed UPOP
- Continued to develop strong working relationships with the Sloan School of Management and with the System Design and Management program, including the recruitment of some 30 System Design and Management/Leaders for Global Operations mentors for senior Gordon Engineering Leaders

In the weekly Engineering Leadership Labs (ELLs), Gordon engineering leaders actively participated in immersive, hands-on engineering leadership learning experiences. ELLs, planned by the program's curriculum development experts and led by ELP students (with Gordon staff oversight, coaching, and assessment), provided dedicated time for students to reflect on their successes and—with program staff coaching—discover opportunities for improvement. Guided learning activities in ELLs included role-play, simulations, design-implement activities, and analyses of case studies, films, and books related to engineering leadership.

Both UPOP and ELP continue to expand the involvement of key stakeholders from leading engineering industry companies and MIT faculty on advisory boards. Members of the ELP Industry Advisory Board and Faculty Advisory Board contribute meaningfully to program development, help to connect program students to internships and industry mentors, and create vortexes that seek to draw more people into supporting ongoing program initiatives. Additionally, the program held professional development activities for program staff and other MIT faculty/staff, convened meetings of project-based instructors, and funded departments for engineering leadership-oriented projects.

In terms of resource development, the program is actively seeking matching funds for the Gordon Foundation contribution. Both UPOP and ELP earned funding in the form of grants from the National Science Foundation and Florida Power & Light, as well as from a pool of committed donors. Program staff are working closely with Resource Development to follow up on contacts made during the kick-off breakfast in May 2009, as well as other potential program supporters, with promising prospects.

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More information about the Gordon–MIT Engineering Leadership Program can be found at http://web.mit.edu/gordonelp/ and more information about the Undergraduate Practice Opportunities Program can be found at http://upop.mit.edu/.