



THAYER SCHOOL OF
ENGINEERING
AT DARTMOUTH

INCLUSIVE EXCELLENCE AT THAYER SCHOOL
July 2018

Launched in May 2016, The Dartmouth Action Plan for Inclusive Excellence highlights the need to continue to create and support a community at Dartmouth in which difference is valued, where each individual's identity and contributions are treated with respect, and where differences lead to a strengthened identity for all.

Thayer School is committed to our role in building a more inclusive and diverse Dartmouth. Broadly, our aims are to:

- Raise awareness of the importance of diversity, inclusivity and respect in the classroom and workplace, and in achieving excellence.
- Further improve the recruitment and retention of a diverse faculty, staff and student body.
- Provide resources and support that enhance diversity and inclusivity at Thayer School.

The following document outlines our practices and plans.

Department overview

Building a teaching and learning community that reflects the diversity of the global workforce and global challenges facing our graduates is central to both the success of the Inclusive Excellence initiative, and our ability to fulfill our founding mission, "to prepare the most capable and faithful for the most responsible positions and the most difficult service."

One of the country's oldest professional schools of engineering, the School operates with a single unified Department of Engineering Sciences offering both undergraduate and graduate programs. Teaching and research is advancing innovation in three focus areas: engineering in medicine; energy technologies; and complex systems. These areas crosscut traditional engineering disciplines and address critical human needs.

Dartmouth undergraduates study engineering as part of a liberal arts education leading to the Bachelor of Arts (AB) degree; most majors take additional courses leading to the professional Bachelor of Engineering (BE) degree. In 2016, Dartmouth granted 52% of its undergraduate engineering degrees to women, making it the first national research

university to award more bachelor's degrees in engineering to women than to men. The national average is ~20 percent.

Graduate programs include the Master of Engineering Management (MEM), MS, and PhD—including the nation's first PhD Innovation Program.

Building and managing a culture of inclusivity

Building a culture that values diversity requires a commitment at all levels of the organization, both philosophical and real. Our most promising opportunity and top priority—in the context of inclusive excellence—is to recruit and engage a diverse faculty, staff, student body and alumni volunteer network.

Of the 22 members on the Board of Advisors, 22% are women and 9% are underrepresented minorities (URMs). This is a significant change from five years ago, when 10% of board members were women (2013-14). An analysis of Thayer alumni plus Dartmouth AB Engineering Sciences majors shows that 12.5% of alumni graduating through 2000 (the likely candidate pool for board members) are women. Of alumni of all classes, 21% are women.

The Dean's Council was established in 2016 to seek input from young alumni who represent the cultural backgrounds of our students of today, and to engage emerging leaders from our most diverse set of alumni. The Dean's Council, and the Master of Engineering Management's Corporate Collaboration Council (CCC), are both broadly diverse and include people from varied areas of professional expertise, geographic locations, and – in the case of the Dean's Council – degree programs.

We will work with both Thayer and Central Advancement to continue to identify and recruit a diverse group of talented alumni leaders.

Work processes and communications

Recent initiatives to make work processes and communications at Thayer School more inclusive and transparent will continue.

Action items and progress:

- Continue the Dean's update, a biannual meeting for all faculty and staff at which the Dean updates the Thayer community on the current state of the school; the Chief Financial and Administrative Officer's (CFAO) "All Hands" meeting, a biannual meeting launched in Fall 2016; and the monthly Administrative Roundtable meetings (ART) for leaders of administrative units (also launched Fall 2016). Collectively, these forums provide an opportunity for senior leaders to speak publically about Thayer's core values—including our commitment to diversity—and opportunities to advance inclusive

excellence. They are also intended to engage, inform, inspire and empower *all* Thayer employees—regardless of rank or position.

- Review and discuss inclusive excellence at Thayer School at each of the following meetings annually:
 - Academic directors meeting
 - Faculty meeting
 - Senior staff meeting
 - Dean’s update
 - All hands meeting
 - ART meeting

- A high-level summary of exit interview and survey findings related to diversity and inclusivity will be shared at both a senior staff meeting and an academic directors meeting.

Professional development

As important as developing a diverse faculty and staff is our ability to create an inclusive environment for a diverse student body. To that end, we will partner with Dartmouth HR and IDE to create and host a series of workshops on relevant topics such as implicit bias and cultural intelligence. In addition, several faculty and staff attend national and regional conferences which build skills and understanding that contribute to an inclusive and diverse workplace each year.

Action items and progress:

- Engagement of Thayer senior leadership with inclusive excellence professional development programs. For example, CFAO Chris Cook will serve on the restructured campus climate committee, and attended the National Conference on Race and Ethnicity (NCORE) in Spring 2018. Professor Petra Taylor and Assistant Dean Holly Wilkinson attended the two-day Institutional Diversity and Equity (IDE) Summit in Winter 2017. With senior leaders personally invested and encouraging broader participation over time, we will 1) model for the community that this is a serious, integrated effort and shared responsibility; and 2) build a cadre of leaders better prepared to advance our efforts in this area.

- As part of the annual performance review process, staff members are asked to comment on how they contribute to a diverse and inclusive workplace. Programs that have attracted Thayer staff in the recent past include Implicit Bias 101 workshops held at Tuck, an Office of Pluralism and Leadership (OPAL) workshop on gender and sexual identities, and the Dartmouth HR leadership training program that includes a module on inclusivity. As part of the annual review, this question prompts a larger discussion about

future learning opportunities for the individual, and provides feedback that supervisors can use to encourage other colleagues and direct reports.

- Students are encouraged to participate in the Thayer chapters of the National Society of Black Engineers (NSBE), Society of Hispanic Professional Engineers (SPHE) and Society of Women Engineers (SWE), and Dartmouth Graduate Women in Science and Engineering (GWISE). These groups provide a local community and offer professional development opportunities. Specific examples include:
 - An annual SWE alumnae panel and networking reception.
 - Financial support for 8-12 undergraduates to attend NSBE's national conference so they can access more diverse role models and mentors (no one has attended the SPHE conference yet). Feedback from young alumni who have attended these conferences indicates it was a significant source of encouragement.
 - Financial support for three women graduate students to attend the Grace Hopper conference in Fall 2018, in partnership with Computer Science.
 - A Women of Thayer networking reception in Summers 2015, 2016 and 2017.
- Professor Petra Bonfert-Taylor convenes an informal faculty gathering for those interested in discussing teaching pedagogy. Meeting once per term, themes have included topics such as active learning, student mental health, assessment, and the future of engineering education (as reported in a recent MIT report). While this reflection on the classroom experience benefits all students, it is particularly important for URMs as research indicates that URM students perform better in active learning versus traditional lecture style settings¹. Typically, 10-15 faculty members participate.

Recruitment and retention

The Dean of Thayer School, chairs of faculty search committees, and the CFAO work closely with IDE and HR's talent acquisition team to proactively build diverse candidate pools and develop recruitment processes that reflect our commitment to an inclusive work environment. Search committees and interview schedules include people from diverse backgrounds whenever possible in order to provide candidates an opportunity to interact with a cross section of faculty representative of the Dartmouth community. In faculty searches, individuals from outside of Thayer have been asked to serve in order to provide intellectual and in some

¹ Scott Freeman, Sarah L Eddy, Miles McDonough, Michelle K Smith, Nnadozie Okoroafor, Hannah Jordt, and Mary Pat Wenderoth: "Active learning increases student performance in science, engineering, and mathematics", PNAS, 23(111):8410–8415, 2014.

Jillian Kinzie, Robert Gonyea, Rick Shoup, and George D. Kuh: "Promoting persistence and success of underrepresented students: Lessons for teaching and learning", New Directions for Teaching and Learning, 2008(115):21–38, 2008.

cases gender diversity. In all searches, finalists are connected with Dartmouth resources such as the Employee Resource Networks (ERN) and Experience Dartmouth (ED) program.

Faculty

We continue to strive to increase the number of women and other URM on our faculty. The most recent Dartmouth Faculty Profile (dated 2016-17, page 86) provides the following data for tenure track faculty at the Thayer School of Engineering. Both values represent progress resulting from a decade of attention to building diverse candidate pools.

	Thayer	Availability
Women	13.9%	14.8%
Minorities	22.2%	24.6%

Success in this effort is reflected in the composition of the junior faculty (untenured tenure track) as well, again as reflected in the most recent Dartmouth Faculty Profile (page 85):

	Thayer Junior Faculty
Women	33.3%
Minorities	33.3%

Considerable growth in the faculty over the next ten years is planned. Attention to networking, building diverse candidate pools, increasing flexibility in recruiting and establishing the terms of the hire are essential if we are to continue to attract the most talented individuals from all backgrounds to our faculty.

The following efforts will be continued or enhanced as noted below:

- The Dean meets with each search committee chair, and then the full search committee, prior to the start of a search to emphasize the importance of building a diverse and talented candidate pool. IDE will provide implicit bias training to search committees. Specialty journals and websites available through organizations such as the Association for Women in Science (AWIS), National Society of Black Engineers (NSBE), and Women Engineering Program Advocates Network (WEPAN) are used along with personal networks and other connections in order to build a diverse pool of candidates *and* a diverse pool of finalists. We work with IDE throughout the recruiting and hiring process, and use Interfolio's Faculty Search tool to ensure transparency and consistency.
- Plans to expand the faculty deliberately retain approximately one-third of faculty lines as areas of expertise "to be determined." This gives us the flexibility to consider all areas in which Thayer might hire over a period of several years, and thereby lets us build a significantly broader pool of candidates. Further, this encourages faculty nomination of candidates.

- Search teams may be asked to consider more candidates, regardless of junior or senior status, as a means to diversify the pool. When an outstanding candidate surfaces in ways other than a search, the Dean brings him or her to Thayer School for an exploratory visit, regardless of his or her level of experience.
- When candidates considering an offer return to campus for a visit, meetings with colleagues across Dartmouth are arranged.
- A faculty mentor (typically a senior faculty member at Thayer School) is formally assigned to each new hire in the offer letter.
- For the past decade the Dean of Thayer School has mentored new junior faculty and offered to formally review one grant proposal per year to help with grant writing. Annual review meetings to discuss teaching, research, grant writing, service, and networking were held annually with the Dean. The Dean also strongly encouraged faculty to work with the Dartmouth Center for the Advancement of Learning (DCAL) upon their arrival on campus. The new dean will be asked to consider how to best meet these broad objectives.
- Reduced teaching assignments for all new faculty are offered for the first few years, and creative appointment terms are also considered as needed. This flexibility allows Thayer to better meet the needs of a more diverse faculty.
- The Dean annually reviews teaching loads and service obligations to ensure female and other URM faculty are treated equitably.
- When appropriate, formal exit interviews and stay interviews will be offered in an effort to increase our understanding of the factors that influence employment decisions.

Staff

Recruitment practices were reviewed in 2018 and guidance is now in place for hiring managers. Best practices and attention to ad placement, as well as involvement by the CFAO and HR Director in every hire, are intended to ensure every effort to develop a diverse pool of candidates and finalists. Several hires over the past 12 months have added to the diversity of the staff.

Students

At the undergraduate level, Thayer School's goal is to build a student body that is similar in composition to that of Dartmouth overall. In 2016, Dartmouth granted 52% of its undergraduate engineering degrees to women, making it the first comprehensive national research university to award more bachelor's degrees in engineering to women than to men. In

2013, 28% of AB engineering degrees were awarded to women; in 2017, 45% of AB engineering degrees were awarded to women (Thayer Stats). The national average is ~20 percent.

Data for the classes of 2016 and 2017 suggest the composition of both classes in terms of URM students and international students is not substantially different from Dartmouth as a whole. We partner with Dartmouth Admissions to ensure we have an admissions staff that is knowledgeable about the Thayer experience, to attract a diverse pool of prospective students, and to enhance the yield of URMs. We continually experiment with various recruiting avenues, most recently co-hosting a booth at the Intel Science and Engineering Fair (May 2018). In addition, we make significant efforts to attract potential engineering majors to Thayer, and to ensure they are successful here (described below).

Over the past five years, enrollments (BE through PhD) have gone from 27% women in 2013 to 36% women in 2017 (OIR). We continue to recruit graduate students by hosting a booth at the SWE and NBSE graduate school/career fairs each year, and support 1-2 graduate students attending these national conferences. These students assist with recruitment efforts while at the conference, and are able to benefit from the mentoring and workshops offered as well. We run an Innovation email campaign to SWE and NSBE chapters at ~ 25-30 target schools. In addition, the Guarini School includes Thayer School in their diversity recruiting efforts.

Numerous initiatives to build an environment in which students thrive have helped improve our retention of all students, and URMs in particular. Examples include:

- Being cognizant of faculty teaching assignments in introductory classes. Of the three sections of Introduction to Engineering offered in 2017-18, two were taught by women.
- Offering a broad array of engineering courses for non-majors, thereby attracting students to Thayer School where they experience first-hand a vibrant, diverse and supportive learning environment.
- The reimagined Dartmouth Emerging Engineers (DEE) program, which aims to improve the first-year experience of students entering Dartmouth with an interest in engineering by 1) providing support and mentoring to all interested students in order to ensure they gain a solid academic foundation prior to beginning engineering courses; and 2) creating a community of learners with an interest in engineering. DEE does this, in part, through nightly open tutoring sessions held at Thayer School (7-10 p.m., Sunday through Thursday) in which peer mentors address questions from pre-requisite classes in Chemistry, Physics, Math, and Introduction to Scientific Computing. While open to all students, students whose incoming academic profile suggests they are less prepared than their peers receive a personal invitation. We are working with OIR to assess the impact of DEE.
- A diverse network of Teaching Assistants (TA), who informally serve as peer mentors, too. We proactively seek to hire a broadly diverse group of TAs (including DEE Tutors).

- Undergraduate research internships, which provide prospective engineering majors with early hands-on experience and mentoring. Like the DEE program, this helps build skills and confidence, which benefits all students but has the added advantage of bringing students who might have been less prepared upon entering Thayer up to expected standards. These internships are offered through the Women in Science Project (WISP) and the First Year Research Experience (FYRE, open to women and men).
- Weekly Tools and Techniques modules. These optional extensions of three courses (Introduction to Engineering, Science of Materials, Systems) allow students who have not had experience with various tools and techniques (for instance, welding and fabrication tools, measuring devices, et al.) to become competent and comfortable with some of the fundamentals. Like the DEE program and undergraduate research internships, these modules help to bring less prepared students to a level that puts them on equal footing with others who have had such opportunities elsewhere.
- Diverse external review boards. Review boards for project-based courses are intentionally diverse. For each of the past three years, the two faculty members teaching our capstone design course have developed an external project review board that is half women. We will be attentive to this engagement opportunity as we work with Advancement to build a diverse and active pool of volunteer alumni.
- Heightened awareness when assigning student project teams. Whenever possible faculty avoid having a single URM on a project team. In addition, we are beginning to discuss ways to encourage students to be aware of factors such as gender bias when distributing work among team members.

Accountability

Action items and progress:

- Faculty are asked to report on “activities undertaken in support of diversity and inclusivity” as part of the annual faculty supplement (added in Spring 2017).
- Staff are asked to report on how they contribute to a diverse and inclusive workplace.
- Each summer, prior to the start of the new academic year:
 - The Dean will meet with the chairs of the prior year’s searches to review demographics of the candidate pools and the finalist pools, search outcomes, and identify the steps that had the greatest impact in broadening the diversity of the pool.
 - Faculty and student body composition will be reviewed and discussed with Thayer’s academic leadership (presently the Academic Directors: Senior

Associate Dean, Department Chair [AB/BE Director], MEM Director, and MS/PhD Director).

- Opportunities (and the timeline) for broadly open (i.e. covering all areas within Thayer) searches will be identified.

- Demographic information on board members and external visitors (e.g. Board of Advisors, Dean's Council, MEM Corporate Collaboration Council, Jones seminar speakers, members of review boards) will be noted, with a goal of increasing the pool of role models available to students, and the diversity of perspectives and experiences presented.