

The Big Idea

By supporting research goals, shaping the trajectory of world-class collaborations, and providing teaching and research services, graduate students play a critical role in elevating the College of Engineering (COE). With an emphasis on student wellbeing and diversity, equity, and inclusion, COE can stake out a stronger position as a center of excellence in research, education, and technological innovation by taking proactive steps to enhance the graduate experience and graduate student support beginning with recruitment and extending beyond graduation.

Strategic Initiatives

Bolster the recruitment of outstanding students:

- **Reimagine recruitment events:** Showcase a broader range of engineering graduate fields and offer more opportunities for all prospective students to connect with peers and role models.
- **Improve web presence:** Develop a central landing page to make it easier for prospective students to explore options, find information, and receive clear guidance.
- **Reduce barriers to entry:** Consider taking steps, such as eliminating GRE score requirements, that could lower application costs, as well as other actions to reduce disparities.

Enhance community and professional development opportunities:

- **Introduce onboarding courses:** Introduce students to their broad and specific engineering communities through two courses that build peer connections and develop professional skills.
- **Establish COE Student Advisory Group:** Create a group that can identify changing and emerging needs of the graduate student community and bring ideas to senior COE leadership.
- **Expand existing professional skills programs:** Collaborate with the Engineering Communications Program, the Engineering Leadership Program, the Sue G. and Harry E. Bovay Program in the History and Ethics of Professional Engineering, and the James McCormick Family Engineering Teaching Excellence Institute to expand opportunities and resources for graduate students.
- **Invest in a full-time graduate career advising position:** Provide focused support for career education, employer relations, and networking.

Invest in graduate student wellbeing:

- **Communicate clearly and consistently:** Encourage community-building, set standards for community interactions, and articulate clear expectations through regular communications.
- **Invest in training, events, and supplemental resources:** Provide learning opportunities, tools, and guidance that improves communication, mentorship, collaborations, and other key areas.

Promote diversity, equity, and inclusion:

- **Strengthen networks:** Partner with national organizations and undergraduate institutions to connect diverse prospective students with Cornell early in their academic careers.
- **Launch new programming:** Create a peer mentoring program, expand the distinguished lecturer series, and strengthen ties to industry to empower students and improve outcomes.

Outcomes

These cumulative efforts will nurture a healthy, vibrant community graduate students and demonstrate a firm college commitment to supporting their overall personal and professional success.

SUMMARY

- *How can Cornell Engineering enhance the quality of graduate education?*

Graduate education plays an important part in fulfilling Cornell University's aspiration to be an exemplary comprehensive research institution. While matriculating through the Graduate School, master's and Ph.D. candidates work closely with faculty in the College of Engineering (COE), supporting research goals, shaping the trajectory of world-class work and providing teaching and mentoring services for their peers.

As part of the Cornell Engineering 2030 plan, the college aims to advance the quality of education that engineering graduate students receive. They should feel welcome and supported from the recruitment stage all the way through professional development and graduation. Taking proactive steps to enhance graduate programming will underscore the importance of student wellbeing, foster diversity, equity and inclusion on campus, and ensure the personal and professional success of a healthy, vibrant community.

A few overarching actions will help advance these goals, including the development of two onboarding courses that will introduce graduate students to both the broader COE community and their field-specific one. Taken during adjacent semesters of their first year, these courses will help students acclimate to campus, build peer connections, learn about engineering ethics and social responsibilities, and practice communication and leadership skills.

Additionally, the establishment of a COE graduate student advisory group can serve to identify the changing and emerging needs of the graduate student community. This will give students regular opportunities to bring new ideas to the attention of senior leadership in the college and in the Graduate School.

The sum of these efforts will promote a culture of broad inquiry, fostering an environment that drives the discovery, preservation and dissemination of knowledge, and educating the next generation of global citizens.

Recommendations

1. Increase efforts to recruit outstanding prospective students

To ensure the overall strength and success of COE programs, it is essential to recruit graduate students who represent a wealth of ideas, backgrounds and ambitions — in addition to their extraordinary scientific skills and academic promise.

The college seeks to ensure that diversity, equity and inclusion are fundamental aspects of the recruitment process — the results of which will be reflected in changes in student body demographics over time. Part of this effort includes offering recruitment events that showcase a broader range of engineering graduate fields and that invite more opportunities for prospective students to connect with potential peers and role models, with a particular focus on underrepresented minority (URM) populations and women in engineering.

It is important for senior leadership in COE and in the Graduate School to collaborate with both Diversity Programs in Engineering (DPE) and the Cornell Office of Inclusion and Student Engagement, as well as

other relevant units, to establish a year-round calendar of recruitment opportunities. This framework will allow the group to take proactive outreach steps in reaching diverse communities.

Similarly, the college should partner with the Graduate School to make sure that all graduate program offerings have a strong web presence on both units' platforms. Developing a central landing page would make it easier for prospective students to navigate the different fields and provide general guidance for applicants who have not yet decided on a field.

More targeted recruitment efforts should include the following:

- Host semesterly college-wide diversity recruitment events — in person, when possible, and complemented by remote programming.
- Work with the Cornell McNair Scholars Program to increase marketing efforts at historically Black colleges and universities, tribal colleges and Latinx colleges.
- Partner with the Office for Global Learning to increase outreach and recruitment to engineering students in Africa, Europe, Central and South America.
- Offer Research Experiences for Undergraduates (REU) programs to introduce new student populations to the COE, and leverage faculty funded by the National Science Foundation to apply for REU supplements.
- Expand opportunities for engineering graduate students in New York City, including at Weill Cornell Medicine and Cornell Tech, both for short periods and for full-time study.
- Provide fellowships for all incoming engineering Ph.D. students for their first semester or first year to help reduce financial insecurity.

The COE and the Graduate School should examine other barriers to entry and work to reduce disparities for prospective students. For example, Cornell could consider eliminating requirements for graduate applicants to provide their GRE test scores, which would lower the cost of application.

Additionally, both the college and the Graduate School should assess the possibility for developing post-baccalaureate or post-master's degree programs to serve as bridges into Ph.D. programs.

All this work will strengthen COE's existing recruitment efforts, which benefit from attractive stipends, fellowships through the DPE, targeted efforts to attract military members and veterans, and the availability of certification programs for professional and career development.

Combined with a highly engaged and enthusiastic graduate community, COE can capitalize on these recruitment tools to increase the diversity of its student body and compete with other top engineering programs across the country.

2. Enhance professional development opportunities to support graduates' careers

Alumni of COE graduate programs have gone on to become world leaders in academia and beyond, and the on-campus orientation they receive in professional development is one of the hallmarks of their Cornell education.

One of the college's main goals is to ensure that all engineering graduate students gain the necessary skills for career success as part of their M.S. and Ph.D. degree programs, and to demonstrate the value of investing in their professional development.

COE aims to provide graduate students with strong communication, teamwork and leadership skills and to instill an adept sense of professional ethics and social responsibility. These development opportunities allow graduates to become well-positioned for future work in government, industry, academia, nonprofits and other career fields.

Specifically, one of the ways the college invests in engineering graduate students is through the teaching assistant (TA) development program, which provides teaching-related knowledge and skills. Building this training into the TA experience actively enhances their overall research success and career development.

As a further investment, the college should collaborate with the Engineering Communications Program to develop a communications course for all graduate students. Ideally, this course would offer a writing component in addition to working on leadership skills. Instructors should also partner with the Engineering Leadership Program team to help meet the needs of international students, especially when they try to develop relationships with potential employers.

Each department should also create a field-specific course for their graduate students that emphasizes engineering communication. Partnership with the Sue G. and Harry E. Bovay Program in the History and Ethics of Professional Engineering can help design curriculum and support the teaching of social responsibility and ethics. Additionally, the college should encourage guest speakers to spend time talking about how they incorporate these skills into their own research and professional careers.

Similarly, the James McCormick Family Engineering Teaching Excellence Institute can help consolidate best practices and teaching tips online so that all faculty, TAs and other graduate students have access to those resources.

Finally, the college should invest in a full-time graduate career advising position that focuses on the specific needs of graduate students — supporting career education, employer relations and networking events. This position will partner with the Engineering Career Center, the Cornell Career Services, and the Engineering Graduate Student Association to develop and promote more professional resources and learning opportunities.

This cumulative work will prepare COE graduates as confident communicators, spanning a variety fields and industries, and leading from a place of responsibility for people and the planet.

3. Investing in graduate student wellbeing

Supporting student wellbeing is critical to ensuring success during graduate school. It is essential for the COE to help foster trust between advisors and graduate students, counter negative microclimates and reduce stigma from gaps in individual experience — which more strongly affect URMs and international students in comparison to domestic and non-URM students.

To create a climate of support for COE graduate students, the college will promote more clear and consistent communication, as well as encouraging community-building opportunities that bring students out of disciplinary silos and boost their overall sense of campus connection.

Communicating consistent expectations to graduate students, faculty advisors and field assistant staff can help set the standard for positive interactions. For example, articulating the expectations for how

graduate students divide their time across research, teaching, coursework and other professional opportunities can help them build trust with their advisors. Similarly, the continual development and discussion of college guidelines for program structures, policies, academic progress and advising methodology will provide the necessary supporting framework for faculty and administrative staff who interact closely with graduate students.

Investment in departmental, college, and university trainings is another key tool for promoting student wellbeing. These learning opportunities are essential in preparing people to work with others who have different backgrounds, cultures, identities and abilities. To promote personal and professional wellbeing, COE could pursue ongoing efforts to provide guided sessions in communication, mentorship, expectation and boundary setting, academic standards and institutional policies, and other workshops.

Community-building events and programming should be encouraged and curated at the lab-level all the way up to the college and Graduate School levels. Within research groups and across departmental fields, COE faculty should put an emphasis on intergroup mentoring. At the college level, the COE can provide intentional community-building opportunities through the development of a first-year transition course or seminar for all engineering graduate students. With support from the Graduate School, Ph.D. students could initiate self-led support groups that provide an outlet for relieving stress and allow them to connect with their peers in other departments across the college or across the university.

By investing in targeted trainings, events and supplemental resources, the COE will increase graduate student wellbeing over time and educate faculty and staff in the crucial role they play in taking both proactive and reactive steps to make sure these efforts are successful.

4. Diversity, equity and inclusion

Investing in a community that values and promotes diverse minds and backgrounds is an essential part of promoting graduate student education.

Over the next 10 years, the COE aims to work with the Graduate School to significantly increase the enrollment of women, URMs, and first-generation college graduates in engineering graduate fields. Currently, women comprise approximately one-third of the engineering graduate student body, and domestic URMs account for about one-fifth of the population.

It is important for both units to invest in more fellowship opportunities for these underrepresented demographics and help lower the financial barriers to higher education. Expanding this kind of structural support will enhance broader recruitment efforts and demonstrate a commitment to providing inclusive, equitable experiences. They should also collaborate to review the admissions process across graduate fields to ensure that prospective students receive a holistic review and that other areas of accessibility are not obstructing their application process.

To recruit more diverse graduate student candidates, the COE should proactively partner with national organizations and undergraduate institutions to create pipelines that connect prospective students with Cornell earlier in their academic career. In addition to hosting Diversity Visit Days, offering concrete opportunities to partner with COE faculty for research or mentoring will foster relationships that increase confidence and success in preparing for graduate school.

The COE should also consider developing networks that attract diverse master's degree students, encouraging them to pursue a Cornell Ph.D. program.

Building on broader diversity, equity and inclusion initiatives, the college plans to launch a peer mentoring program for graduate students who are not already receiving dedicated support from fellowships or leadership programs. It will also expand the distinguished lecturer series so that current graduate students periodically receive professional advice from academic and industry leaders. Other efforts to strengthen ties with industry may similarly produce more ways for graduate students to gain field-specific mentoring and career support.

These cumulative efforts will nurture a diverse body of graduate students throughout their degree program and demonstrate a firm college commitment to supporting their overall success.