NORTHEASTERN 2025:
Distinctively Excellent PhD Education

A White Paper about
Northeastern’s PhD Programs in 2025
Prepared by the PhD Joint Task Force

A committee jointly charged by the

Senate Agenda Committee

&

Provost James C. Bean

Task Force Members:

Jane Amidon, Professor and Associate Dean, CAMD (j.amidon@neu.edu)
Tim Bickmore, Professor, CCIS (t.bickmore@neu.edu)
Elizabeth Dillon, Professor and Chair, CSSH (e.dillon@neu.edu)
Ranjini Ghosh, PhD Candidate and President, GSG (ghosh.r@husky.neu.edu)
Phil He, Associate Vice Provost, Graduate Education (n.he@neu.edu)
Karin Lifter, Professor and Chair, Bouve (k.lifter@neu.edu)
Carla Mattos, Professor, COS (c.mattos@neu.edu)
Fernando Suarez, Jean C. Tempel Professor, DMSB (f.suarez@neu.edu)
Sara Wadia-Fascetti, Professor and Associate Dean, COE (s.wadia-fascetti@neu.edu)
David Ignatius Walsh, BioEng PhD ‘16; Vice President, GSG (walsh.dav@husky.neu.edu)
August 8, 2016

To the Northeastern University Community:

The PhD Joint Task Force Committee was charged by the Faculty Senate and the Office of the Provost to envision Northeastern’s PhD programs in 2025. This effort was also one component of the Northeastern 2025 Academic Planning process. Our charge was to develop a framework that would enable our PhD programs to become a beacon for Northeastern in 2025. While what we present in the report may apply to a broad range of graduate programs, our focus was on the research PhD programs.

To understand our existing programs and envision their future, we held Town Hall meetings, met with faculty and students across colleges, surveyed students, met with the Faculty Senate, Associate Deans, many Department Chairs, and studied aspirant institutions. Nearly 50% of Northeastern’s 1,300 doctoral students responded to a survey we conducted. In our conversations, we identified faculty and student aspirations, best practices within Northeastern and peer institutions, and opportunities to excel as well as barriers to success and the vast differences across our programs.

The result is this White Paper titled, “Northeastern 2025: Distinctively Excellent PhD Education,” an eight-point framework focused on excellence, innovation, interdisciplinarity, distinctiveness, existing effective activities, the need for a centralized unit to support doctoral education, and career preparedness for PhD graduates. The goal of the framework is to provide a scaffold for elevating the stature of Northeastern’s PhD programs.

This framework was distributed broadly in a draft report to the entire Northeastern community. Each college held open forums to discuss the report and PhD student leaders shared their views. These conversations enabled us to further develop and refine ideas for supporting and enhancing overall excellence and innovative scholarship. In order to remove barriers to interdisciplinary doctoral programs and to enable the creation of PhD internships, we have created a list of essential action Steps in relation to each of the eight elements of our framework. We have also developed bold ideas and specific initiatives that will help Northeastern to leapfrog the competition and attract the best, brightest, and most creative research minds. A distinctive feature of Northeastern is our partnership with the many organizations that hire our graduates; thus, we have broadened the discussion about doctoral training to include the need for experiential education opportunities within and beyond the University.

The recommendations are intended to build upon the many outstanding support programs within our colleges and to provide a foundation upon which new programs and innovative support structures can be created. Thus, together with presenting new ideas, we have highlighted exemplary programs already in place and encourage departments and colleges to harness these and other opportunities.
Guaranteed and stable funding is the most critical component required to achieve distinctly excellent PhD education. The PhD Joint Task Force recommends that as soon as possible and certainly by 2025, all PhD students are recruited to Northeastern with guaranteed five-year funding packages that include summer and professional development support. Implementation of these five-year offers will vary across departments and colleges, and will require a transformation in our thinking, administrative policies, and infrastructure to ensure that funding is both available and tailored to the students’ goals and preferences.

Thank you for taking the time to read this report. Supporting data are available as appendices through the Faculty Senate Office. We as a Task Force look forward to your consideration of these recommendations that we trust, when implemented, will propel our PhD programs to new heights.

Respectfully submitted by the members of the PhD Joint Task Force,

Jane Amidon; Professor & Associate Dean
College of Arts, Media & Design

Karin Lifter; Professor & Chair
Bouve College of Health Sciences

Tim Bickmore; Professor
College of Computer & Information Science

Carla Mattos; Professor
College of Science

Elizabeth Maddock Dillon; Professor & Chair
College of Social Science & Humanities

Fernando F. Suarez, Jean C. Tempel Professor
D’Amore-McKim School of Business

Ranjini Ghosh; PhD Candidate, College of Social Science & Humanities; President, Graduate Student Government

Sara Wadia-Fascetti, Professor & Associate Dean
College of Engineering, Task Force Convener

Phil He; Associate Vice Provost for Graduate Education; Office of The Provost

David Ignatius Walsh, Bioengineering PhD ‘16
College of Engineering; Vice President, Graduate Student Government
NORTHEASTERN 2025: Distinctively Excellent PhD Education

Context
At this moment in Northeastern’s history, the distinctive strengths of our academic units offer the foundation to creatively develop new areas of excellence. Our purposeful, use-inspired, and interdisciplinary research strengths and talented faculty have created an intellectually ambitious and entrepreneurial environment for PhD education. Our investments in critical research facilities, including the new Interdisciplinary Science and Engineering Center and the Northeastern Innovation Campus in Burlington, together with over 500 new tenure and tenure track faculty hired since 2006, contribute to a scholarly ecosystem that engages PhD students, postdoctoral research fellows, and faculty. Our global reach and diversity—represented by research collaborators who are diverse in experience and partnerships that cross national borders—contribute to the NU Global Network and enhance our research and teaching community. Our historical role in defining experiential learning has enabled us to pioneer education with industry partners and attract the interest of universities from around the world who want to learn about our “secret sauce” in designing effective experiential learning at the undergraduate level. Today we have the opportunity to harness these strengths to create a framework for Northeastern’s 2025 PhD programs that will be distinctive, rigorous, impactful, and attractive to the highest qualified students.

To excel we need to be focused and purposeful and we must build on our strengths. Over the past decade, Northeastern has built a world-class faculty through strategic and aggressive hiring. The research agendas, teaching, mentoring, and vision of this faculty will drive innovations in doctoral education. As we develop a roadmap for doctoral education, it will be important to keep in mind that one size does not fit all colleges and departments: rather, innovation and excellence will require responsiveness and agility to meet the needs and opportunities of students in different fields. The ultimate measure of the quality of our PhD programs is the success of our graduates: where they are placed, their career paths, and their impact – within academia and beyond. Thus, our graduates must be rigorously trained, have deep knowledge in their fields, be able to work creatively across fields, and be agile as they build their careers within academia and beyond, in business, industry (large and small), start-ups, not-for-profit organizations, government, research laboratories, health services, and more. To ensure great post-graduate placements, the education experience needs to be distinctive, engage students in purposeful scholarly research, include deep and varied disciplinary knowledge, require critical and independent thinking, and support graduates for professional success.
Vision

Northeastern in 2025 will be known as an institution that produces selective, high-quality PhD graduates who are rigorously trained, engaged in innovative and experiential work, are grounded in a strong sense of purpose, and are prepared for impactful careers within and beyond the academy.

Shared Values

PhD activities aligned with shared values will drive our programs forward to achieve distinction.

- **Excellence with purpose**: Decisions related to Northeastern’s PhD programs will be made with an eye for academic rigor and impact.
- **Innovative thinking**: Education programs, mentoring programs, and research scholarship will be recognized for their novel content and path-breaking approaches.
- **Crossing boundaries**: Students will cross disciplinary and national boundaries to obtain an innovative and high-quality educational experience.
- **Integrative education**: Scholarship and research training will be integrated with collaborative fieldwork and professional development in a student-centered community.
- **Inclusive diversity**: Inclusion of students and faculty of diverse backgrounds of all kinds will bring a wide range of perspectives and drive excellence in distinctive PhD education.

A Framework for PhD Programs in 2025

Our current PhD programs have evolved within their respective disciplinary units. While they have unique strengths, we now have an unprecedented opportunity to look across all of our PhD programs and identify common drivers and barriers that can be addressed on a university-wide basis. To achieve distinctive and excellent PhD programs by 2025, immediate attention is required across multiple areas and at several levels. A central challenge in addressing doctoral education university-wide lies in the diversity and specificity of departmental and disciplinary structures, norms, and needs in research, teaching, and training. We recognize that one size does not fit all in doctoral education. With attention to the need to maintain program-level decision making and field-based intellectual expertise, we propose the following blueprint for change that will support doctoral students and faculty in elevating our programs across disciplines to the highest levels. In the sections that follow, we propose action items that are essential for us to succeed together with bold ideas that, while potentially transformative, will require community understanding, acceptance, and participation.

I. Recruit the best students with aggressive funding
II. Develop excellence in all programs
III. Immerse students into a culture of scholarship and inclusion
IV. Engage students in teaching and broader career-oriented training
V. Offer every student purposeful options for experiential education within and beyond the University
VI. Cultivate a culture of mentorship
VII. Centralize resources for support without adding bureaucracy
VIII. Promote innovation in program design
The Framework: Overview

In 2025 Northeastern will be known for its flagship PhD programs. To achieve this stature, we need to implement several fundamental shifts in how we go about PhD education today, and to propel our ascent, these shifts must coalesce. Our approach to this framework will be as diverse as the variety of our disciplines; it will ensure that all academic decisions are made by faculty and that academic freedom remains with the programs, while at the same time we make necessary changes and strategically provide resources to take full advantage of our potential.

I. Recruit the best students with aggressive funding

In 2025, Northeastern University will attract the best PhD students by recruiting all incoming students with aggressive funding packages. All students will be recruited with at least five years of guaranteed 12-month funding, and will have access to financial support to attend conferences and pursue fieldwork. Our students will be supported continuously to completion through diversified sources of funding including research grants, fellowships, and opportunities both within and beyond Northeastern. A new PhD Fellowship program supported by strategic partners and individual donors will elevate our stature because our students will have funding that goes beyond their stipends and includes travel funding for conferences, workshops, and other professional development opportunities. Novel funding sources obtained through structured partnerships with industry, government, and not-for-profit organizations will create new pathways for research and education. Industry partnerships associated with our distinctive research themes in cybersecurity and network science, for example, will lead to pathways that both attract students and prepare them for their careers.

Our PhD students will be diverse in all respects and they will be attracted to Northeastern’s inclusive scholarly community. Our recruitment efforts will be embedded within undergraduate education at Northeastern and beyond. By engaging the most promising visiting undergraduate students from around the world in research with our world-class faculty, we will become a first-choice PhD program over our 2016 aspirant institutions. In 2025, the most competitive PhD applicants will choose Northeastern for our research reputation, our visionary faculty, and our distinctive ability to mentor and prepare our graduates for impactful careers.

II. Develop excellence in all programs

In 2025, Northeastern’s PhD programs will be excellent, distinct, and ranked within the top 30 universities in major rankings. Our programs will be highly selective and will always emphasize quality over quantity. We will have acquired a worldwide reputation for excellence in academic and non-academic circles, which will be reflected our metrics of input, throughput, and output for each of our programs. We will have developed metrics that describe the impact of scholarship, innovation, and careers within and beyond the academy; these metrics will become standards in higher education. Our peers will compare us to the strongest research universities. A challenge in this context is the rapidly changing environment of higher education includes the shrinking of the professorate and diminishing research funding in many domains. It will be important to
attend to the changing nature of traditional disciplines as well as the new roles that individuals with doctoral degrees may play in fields outside of the academy. By offering doctoral training that is deeply grounded in research and the mentorship of stellar faculty, and conjoining this with an ability to move in new and innovative directions (across and between fields, into the creation of new fields, and across the line between inside and outside the university), we will provide a new level of training and support that will give value and purpose to the doctoral degree into the coming decades. We will demonstrate the value of our doctoral education by measuring, debating, and publicizing a new understanding of “ambidextrous” PhD programs that enable innovation in research and education.

III. Immerse students into a culture of scholarship and inclusion

In 2025, a culture of scholarship will be pervasive among Northeastern’s PhD students, postdoctoral research associates, and the faculty and staff who mentor and support them. PhD students will be embraced as apprentices in their research groups, departments, and centers of excellence. Throughout their education, students will move in and out of different roles that will enable them to fully experience all components of research. Through their experiences they will learn how to define a research problem, how to formulate a research contribution, how to write successful proposals for different funding organizations, including industry, and how to disseminate their research in publications (e.g., journals, books, conferences) to achieve the highest impact. Students will work on defining disciplinary, multidisciplinary, and interdisciplinary problems. Students will learn how to navigate the diversity of thought across disciplines, enabling them to be inclusive while they synthesize the viewpoints, methods, and experiences of other disciplines into their own research. Northeastern PhD students in 2025 will excel in this synthesis; they will learn how to describe the impact of this research; they will disseminate this knowledge as they embark on their careers.

IV. Engage students in teaching and broader career-oriented training

In 2025, in addition to rigorous scholarly training, all PhD students will engage in supervised teaching experiences and they will have access to a curriculum specifically designed to build both their teaching skills and skills germane to their fields and future careers. As a result, in 2025, nearly all of Northeastern’s PhD graduates will be employed at graduation, and their successful employment record, in the academy and beyond, will continue to augment Northeastern’s reputation. Career-specific training in teaching and leadership will provide PhD students with holistic experiences designed to position them for successful PhD education and career pathways. For instance, students will acquire teamwork and communication skills that will enable them to collaborate with a diverse community of mentors, peers, younger students, partners beyond the university, and consumers of their research results - within and beyond their own disciplines. Our training will be integrative and cross-disciplinary, enabling students to engage with a flexible career-oriented curriculum throughout their education. It will extend their growth in scholarship by providing opportunities for PhD students to integrate and practice these new skills sets in the classroom and within their own research projects. Our PhD students will thus be given the tools to navigate diverse career pathways.
V. Offer every student purposeful options for experiential education within and beyond the University

In 2025, learning experiences within and beyond the University will be an integral component of Northeastern PhD education in many fields. Our approach to experiential learning for PhD students will be one of our distinctive features and go beyond the standard undergraduate “co-op” or the popularized “research internship.” It is integrated with rigorous research to train students in synthesis and creativity. These learning experiences will guide students in integrating the value and use of their research in either academic or practice-oriented pursuits. Experiential PhD education in 2025 will enable students to learn from environments where their disciplines are “in action” in the world within and beyond the university. PhD students will have the option to choose from different experiential pathways to see first hand the challenges that their disciplines face in the field and to assess relations between practical and theoretical knowledge domains. New industry-research partnerships in high profile research areas will attract and engage students, faculty, and industry partners in education that teach innovation as part of multidisciplinary PhD research. Our operating principle of immersion in the field will result in our students and faculty articulating new kinds of research problems that will, in turn, be solved with doctoral-level research and evaluated against our academic standards. Given the changing nature of higher education and the competitive job market in many fields, experiential training will give our students an edge, not only in the traditional academic job market, but also outside of academia.

VI. Cultivate a culture of mentorship

In 2025, PhD students will be attracted to Northeastern because of our reputation for supporting and guiding PhD students through every step of their educational trajectory in an academic community that is focused on their intellectual, professional, and personal growth. Full immersion into the university and access to university resources will be supported through faculty and peer mentors. Advisors will provide intellectual leadership and an atmosphere of support as a fundamental means of mentoring our students toward successful careers. Northeastern PhD students will navigate academic milestones with guidance from research advisors, peer mentors, and advisory groups who will provide this purposeful mentoring. Northeastern PhD advisors will develop academic plans for each PhD student with research and publication targets designed to prepare students not only to graduate, but to be poised for top-tier positions following graduation -- within the academy and beyond. Many students will benefit from significant assistance and advice on non-academic topics during their PhD. This will span work-life balance, development of good research and study habits, writing and communication skills, project and personnel management, professional service, proposal writing, and entrepreneurial activities.
VII. Centralize resources for support without adding bureaucracy

In 2025, Northeastern will offer centralized university-wide resources to doctoral students together with program-level academic guidance and training. Gaps in student and faculty support services will be filled with this new centralized resource and implemented with a hybrid approach leveraging expertise and programs across Northeastern. This resource will include physical and virtual infrastructure to further foster community, administrative resources for innovative programs, and will leverage resources from other university units for the benefit of the colleges, such as marketing materials and data collection. The centralized infrastructure will also provide an array of resources that serve the academic, professional, and work-life needs of students to complement efforts at the departmental and college levels. Thus, students will have one place to go to access information about support services that are provided by the colleges, the Center for the Advancement of Teaching and Learning through Research (CATLR), research support offices, and the writing center. Resources will also include travel funding; access to professional development; access to support for students negotiating differences with faculty members; access to support for addressing issues of discrimination, harassment, or assault; and services related to housing, child care, family needs, and mental and physical health. This centralized resource will assist students who have questions about interactions with their advisors or questions around how academic policy is applied to graduate students. We will routinely assess and review the appropriateness of these services for PhD students, and improve them accordingly, so that we always provide the support needed for students to flourish while they are pursuing their degrees. We will recognize the whole student and the diversity of needs of each student including career ambitions, family lives, and academic pursuits.

VIII. Promote innovation in program design

In 2025, Northeastern’s PhD programs will excel in scholarship and reputation while supporting innovation. We will have pathways that will enable the creation of novel PhD programs and take full advantage of our ever-increasing research capabilities, our collaborative approach to scholarship, and our distinctive educational model. We will have mastered the ability to design innovative PhD programs while constantly improving our existing ones. Our most successful PhD programs will be fully ambidextrous; that is, we will have achieved a continuously reinforcing combination of academic rigor and practical relevance. We will achieve this through PhD program designs that will provide students with deep understanding of industry and societal problems and disciplinary knowledge and opportunities, which in turn will inform the research topics they pursue by using or actively improving state-of-the art theories and methodologies. Programs will have the flexibility to create pathways to alternative dissertations, which students may propose. We will have created cross-university collaborations in the Boston area, thus opening up a broad selection of doctoral-level coursework to our PhD students. This will enable us to continue to offer cutting-edge education to classrooms filled with students from neighboring Boston-area universities, when the numbers of Northeastern students may not warrant offering a given course. Through our ambidextrous approach, we will train PhD
students to synthesize across disciplines and skill sets to create impactful research; and we will do this by leveraging the whole university, its global network, and our strategic partners.

The Framework: Implementation

Each of the eight points in the framework is described with essential action steps that when implemented will achieve change, and bold ideas that have the potential to lead to focused and innovative impact with our PhD programs. Following, is a more detailed description for each point in the Framework, including aspirational goals for 2025, description of the current opportunity, actions that are essential to achieve our goal, and visionary ideas that can bring distinctiveness to Northeastern's PhD programs.

I. Recruit the best students with aggressive funding

2025 Goal: Recruit a diverse demographic of PhD students with all PhD students supported by funding on entry - at least five years of 12-month funding.

Opportunity: Currently, the level and consistency of funding is uneven across our PhD programs, and clearly below those of our aspirational institutions. This puts Northeastern at a major disadvantage when it comes to attracting the best possible students. Our survey indicates that uncertain and less-than-adequate funding is the most broadly shared concern of current doctoral students.

Essential Action Steps: The following action Steps will set the stage for Northeastern to compete for the best students:

- Review funding processes and systems to identify barriers to making the proposed five-year offers for each PhD degree program and implement the necessary changes to remove these barriers.

- Ensure that written offers to all incoming PhD students at Northeastern specify 12 months of continuous funding for five years and competitive support for conferences and research travel.

- Strive to increase and diversify our sources of funding by:
  - Creating and maintaining an up-to-date database of external fellowships, grantors and recipients, easily accessible by the colleges, to better identify sources of external fellowships, both domestic and foreign.
  - Identifying gaps and improving processes to facilitate the acquisition of research grants and fellowships on behalf of students.
  - Making sure teaching assistantships are part of a well-designed educational experience and not simply a way to fill the teaching needs of the respective colleges. TAs should be given meaningful work, properly guided and supported, and not over-worked.
○ Institutionalizing a truly meaningful “PhD internship experience” with individual firms or other non-academic institutions, for stays of six months to a year, which will be offered as an option to all PhD students.

○ Proactively pursuing and recruiting students from historically underrepresented groups through strategic partnerships to build a diverse cohort of students, and offering focused support for non-traditional students who join our programs.

Visionary Action Steps (Bold Ideas):

● A novel source of funding and educational experiences will grow out of membership programs offered to private firms focused on specific areas where NU claims distinctive competencies (e.g., cybersecurity, network science). Firms that join such a program would pay an annual membership fee or support specific research programs in exchange for early access to research results, discounts for workshops or seminars in the research domain, and the possibility to interact with researchers to help inform the research agenda. Special care should be taken to avoid a “customer” relationship with industry so as to maintain the researchers’ academic freedom.
II. Develop excellence in all programs

**2025 Goal:** Achieve widespread recognition of excellence and distinction for all our PhD programs, reflected by a top 30 position in the major rankings.

**Opportunity:** Due to our own shortcomings in funding and support for PhD students, and a lack of external awareness of Northeastern’s research-oriented transformation of the last decade, we have not always been able to attract the best possible PhD students nor to properly help them through their programs. By improving the quality of our entering students, decisively tackling our shortcomings in support, and improving Northeastern’s visibility, we could rapidly elevate the quality of our PhD programs. As noted, a number of metrics need to be established to help us understand and monitor progress toward our goals.

**Essential Action Steps:**

- Define a set of metrics to monitor the progress in the quality of Northeastern PhD programs along the following dimensions.
  - **By input:** Metrics that describe the quality of the students Northeastern attracts. For example: research experience, grit, student diversity and demographics considered within the context of traditional metrics.
  - **By throughput:** Metrics to measure the quality of the student experience, e.g., time to degree, retention rate, etc.
  - **By output:** Metrics to measure the accomplishments of PhD graduates, ultimate employment, and impact of their careers. For instance: quality of schools in academic placements; publications during and after PhD program; citation count; role and responsibilities in non-academic placements, etc. Special emphasis should be placed on excellence in academic positions: these are considered crucial to increasing our peer recognition as a major research institution.

- Analyze and determine the “right-sizing” of each PhD program, with a focus on quality over quantity, and based on market conditions and availability of resources.

- Leverage the high concentration of research universities in Boston to enhance our PhD offerings through collaboration (developed in Point VIII of this report).

- Remove barriers that make it difficult for students to take courses across programs, departments, and colleges.

**Visionary Action Steps (Bold Ideas):**

- Encourage the creation of multidisciplinary PhD programs in specific areas where Northeastern has a competitive advantage and increased peer recognition. Novel programs in focused areas of expertise can bring visibility and further peer recognition for Northeastern, contributing to its reputation of excellence in research.

- Develop nontraditional metrics that measure the impact and innovation of students and graduates of our PhD programs.
III. Immerse students in a culture of scholarship and inclusion

**2025 Goal:** Create a pervasive culture of scholarship among Northeastern’s PhD students, postdoctoral research associates, and the faculty and staff who mentor and support them; position doctoral students as core members of the Northeastern community who stand at the forefront of the increased worldwide prestige achieved by the university.

**Opportunity:** Northeastern University has experienced tremendous growth in external funding, resulting in an overall research community that is stronger than ever. It has increased its stature in the community and the world. This research community is poised to contribute to an even stronger culture of scholarship on behalf of PhD students. All faculty members should regard themselves as mentors to PhD students. We have the opportunity to harness our recent research success and extend it to all of Northeastern to elevate our research-oriented graduate student culture to new heights. A culture of scholarship involves deep immersion in the field. This involves observing research activities, formulating research questions, working on research teams, developing a research program, publishing results, advancing the scholarly conversation, and creating new knowledge. It also includes developing relationships with members of the research enterprise – peers, undergraduate students, postdoctoral researchers, and mentors. Such relationships are fostered through the development of various training activities as well as the development of “traditions of recognition” for PhD students.

**Essential Action Steps:**

- Devise strategies to effectively recruit and enroll students from underrepresented minority groups to PhD programs. This should take into account field specific demographics. Known best-practices include:
  - Build and strengthen relationships with faculty mentors from minority serving institutions.
  - Create summer undergraduate research experiences for these populations.

- All PhD students should be provided with a community of support that goes beyond research activities in emphasizing the development of social activities (e.g., a space for PhD students to gather), peer support and mentoring, and creating new traditions in addition to the annual academic honors celebration and the PhD Hooding and Graduation Ceremony. Special consideration should be given to the needs of students from underrepresented groups with the goal of facilitating their full inclusion into the academic and social culture of the University.

- All first-year PhD students should have experiences that provide them with the skills necessary to succeed in their education and future careers.
  - Activities could include participating on research teams and developing independent pre-dissertation research projects.
  - Skills should include in-depth introductions to research programs as well as ethics and communication skills.

- All PhD students should be mentored through their research programs and into their careers, and immersed in a research culture within and outside the University. This mentoring should include the research advisor and other members of the dissertation
committee in active roles through regular meetings and social opportunities. Mentors will include advanced PhD students as well as faculty from outside the student’s major department.

Visionary Action Steps (Bold Ideas):

- The academic, industrial, healthcare, and education communities in Boston are without parallel. A concept for leveraging Boston as an academic city is presented in VIII.
- Consistent with the spirit of expanded research mentorship, every PhD dissertation committee should include at least one member from outside the University drawn from highly respected national or international research institutions. This will benefit the students and will provide increased visibility to our highly successful research programs.
IV. Engage students in teaching and broader career-oriented training

2025 Goal: Engage all PhD students in supervised teaching experiences and provide them with access to a curriculum specifically designed to build career management skills. We aspire to an employment rate at graduation of 100% for Northeastern’s PhD graduates in academic, postdoctoral research, or field-oriented positions beyond academia.

The Opportunity: Teaching is central to the academic enterprise, and it builds skill-sets that are critical for communication and problem-solving in any professional setting. Accordingly, it should to be an essential component of doctoral education, whether or not students plan to seek academic positions upon graduation. In the development of this report, significant, although differentiated, patterns emerged in student and faculty feedback around current PhD teaching. In some colleges, the teaching loads are too heavy; in others, the teaching experience is not integrated into a student’s areas of study or research. Across the university, teaching is considered an essential component of the PhD experience, yet there is a perceived lack of training, support and recognition for the essential teaching roles that PhD students play. Moving forward, Northeastern has an opportunity to create a productive, meaningful, well-supported and diverse PhD teaching community by building high quality and innovative training in addition to mentorship and support programs. Consistent with our aspirant institutions, a significant portion of our PhD students report seeking careers beyond the academy. We have an opportunity to provide high quality career support services to our PhD students, which will in turn have a direct impact on career opportunities.

Essential Action Steps:

- Partner with CATLR to offer cutting-edge workshops that go beyond TA orientation to provide year-round, multi-level training, supervision, observation and evaluation cohorts, as well as portals for focused and individualized consultation by course-type and level, subject matter and teaching method. Nominate PhD students for the Future Faculty program.
- Foster broad awareness of how PhD teaching fits into the academic context of Northeastern by linking existing and forthcoming resources into a constellation of support and mentorship. Support and engage PhD students in the creation of innovative learning environments. Bring these dialogues and relationships to the course level by engaging upper level PhD instructors in developing and evaluating course materials.
- Establish best practices by program, college and field to enable an effective balance between PhD teaching and research activities for each year, or phase, of a student’s tenure at Northeastern.

Visionary Action Steps (Bold Ideas):

- Create a PhD Professional Development Passport, which includes access to a suite of professional development activities specifically designed, developed, and offered to PhD students. The “passport” program will provide credit to students for making use of specially created professional development programs. This passport will include a leadership program designed to enable our PhD graduates to accelerate their careers.
V. Offer every student purposeful options for experiential education within and beyond the university

2025 Goal: Provide all PhD students with meaningful, discipline-specific experiences within and beyond the University, carefully designed to be an integral component of the Northeastern PhD education and to inform the academic research our students will conduct.

The Opportunity: Our PhD students, regardless of their ultimate career paths, can benefit from the integration of experiences that expose them to practices beyond the university. This component of a Northeastern PhD education prepares graduates for purposeful careers and prepares future faculty to educate the next generation. We will leverage and re-imagine Northeastern’s world-class experiential learning model and cooperative education partnerships to design research-based exposure to careers beyond the university. There is some debate as to whether such a focus on practical knowledge will weaken a commitment to theoretical knowledge and academic career paths. In order to avoid that risk it will be important that, when moving forward, we ensure that experiential education will not change the academic standards or expectations of the PhD degree. We propose that experiences outside the academy should re-conceive the traditional undergraduate “co-op” model in a way that bridges the industry’s or organization’s specific interests with our PhD students’ goal of producing rigorous research and practice. Finally, implementation will need to be defined in discipline-specific ways. All programs should be encouraged to incorporate novel pathways for immersive interactions with organizations outside the academy, and use-inspired research in which students work on real problems posed by organizations in ways consistent with pursuing rigorous intellectual inquiry and research questions in their respective fields.

Essential Action Steps:
- Expand the existing Industry PhD programs to other related disciplines to create clustered interdisciplinary focus areas, which eventually could be elevated to multidisciplinary PhD programs.
- Expand existing “internship” and practicum opportunities to all PhD students or design equivalent experiential opportunities within the university.
- Remove financial barriers for students to pursue internships outside the university.
- Encourage departments to review dissertation committee structures and include members with earned doctorates from outside the university including from outside the academy.

Visionary Action Steps (Bold Ideas):
- Create structured partnerships (via a consortium model) with industry sectors that Northeastern hosts in regular workshops to share research, feature students, and promote collaborations. Design the program so that relationships extend to internship and career opportunities for PhD students and postdoctoral fellows.
- Develop ambidextrous PhD Programs: See expanded description in VIII.
VI. Cultivate a culture of mentorship

2025 Goal: Achieve a reputation of distinction for supporting and guiding PhD students through every step of their educational trajectory through personalized academic plans developed in conjunction with their advisors.

The Opportunity: Although PhD academic milestones are necessarily well-defined, students require significant more guidance than program requirements offer. The best PhD advisors develop academic plans for their students with frequent research and publication targets designed to prepare students not merely to graduate, but to be poised for top-tier positions following graduation. Most students can also benefit from significant assistance and advice on non-academic topics during their PhD education—spanning work-life balance, development of good research and study habits and interpersonal skills, writing skills, project and personnel management, professional service, proposal writing, and entrepreneurial activities. Advisors are positioned to provide the most immediate and proximal source of guidance on these topics. A culture of nurturance and of intellectual support is also key to improving the PhD experience, with the positive side-effect of improving the reputation of our faculty and the institution. Any changes to current advisor-advisee mentoring must not disrupt or diminish this relationship, which is essential to PhD education. The suggestions below are intended as enhancements only.

Essential Action Steps:

● The importance of mentoring and of providing a supportive atmosphere for PhD students will be clearly communicated to all faculty on a regular basis.

● Leveraging of the evolving STEM - faculty led mentoring workshop supported by Northeastern’s ADVANCE Office for Faculty Development will provide every faculty member, who advises PhD students, a venue for conversation about best practices in mentoring. Topics may include: how to collaborate with students on planning their academic and professional trajectories; advising on research management and non-academic/personal topics; how to mentor students from different backgrounds; and resources available for additional support.

● Effective mentoring will be publicized and valued as part of faculty annual reviews and the promotion process.

● Coaching will be available to faculty to enable them to be effective mentors to their PhD students.

Visionary Action Steps (Bold Ideas):

● In 2025, all advising faculty will be rewarded for their mentoring. Faculty should demonstrate mastery of the mentoring workshop material before they advise PhD students. Faculty will
receive feedback on their annual academic trajectory plans for their students. Akin to the teaching evaluation practice, PhD students will have the opportunity to provide feedback annually on their advisors' research mentoring. Advisor performance will be incorporated into tenure and promotion review as well as annual merit reviews. Faculty who truly excel in quantity and quality of mentoring will be recognized and rewarded with course releases and other support.

- Co-advised PhD dissertations will be a standard option, with advisors drawn from different units to promote interdisciplinarity. Advisors can be from Northeastern and, when appropriate, from non-academic organizations to promote experiential learning. They can also come from different countries to promote global learning. Having multiple advisors can reduce student dependency on a single advisor, thus promoting intellectual independence. To maintain academic standards, the primary advisor must be on the Northeastern faculty and all additional members will serve on the committee.

- PhD students will advise at least one undergraduate student on a research project. This has many benefits, including: 1) providing research opportunities for undergraduates; 2) providing PhDs with practice in mentoring; and 3) providing a recruitment channel for strong undergraduates interested in research careers to go into our PhD programs.
VII. Centralized resources for support without adding bureaucracy

2025 Goal: Offer resources through a centralized structure that complements, but does not interfere with those of the colleges or departments, and provides PhD students with program-level academic guidance, training, professional development, and solutions to work-life needs.

The Opportunity: Although a powerful centralized structure can potentially add unnecessary bureaucracy and curtail decision making at the school and departmental levels, the lack of it generates gaps and coordination problems that result in suboptimal support for students. Northeastern has the opportunity to create a pool of centralized resources in a carefully-designed structure that provides many of the support and services our students are not currently receiving. This will be achieved without infringing on the freedom and decentralization necessary for our different schools to be innovative and responsive to their respective needs (e.g. admissions).

Essential Action Steps:

● Create a shared vision for the centralized structure that complements and leverages the many existing effective services (such as teaching training, department/college mentoring, leadership development, career services, corporate partnerships) that are already in place for PhD students.

● Strive to create a diverse PhD student body that will experience an inclusive community in both physical and virtual spaces as well as in activities and events. Through this structure students will learn to step outside of their disciplinary and personal boundaries and engage in academic exchange and cultural dialogue.

● Create physical space for the centralized programs including a graduate fellowship office to support students in identifying and applying for novel and traditional sources of funding. Streamline students’ access to university fellowships and conference attendance funds through a common and seamless application in coordination with the colleges.

● Leverage units across campus to develop coordinated, effective and consistent marketing strategies. These marketing strategies will include innovative materials with a cohesive messaging (videos, social media, printed collaterals, etc.). Cross-institutional coordination will leverage proactive marketing at graduate fairs and regional partners.

● Adopt and deploy an effective virtual venue for communication, guidance, and networking.

● Secure and offer resources that strengthen department initiatives to meet student recruitment goals. This includes Northeastern’s most prestigious PhD Fellowship packages and other incentives to recruit the most promising students. Create and streamline systems and processes that will provide the infrastructure as an insurance policy for departments to make the five year offers needed to recruit the best students.
• Provide clarification as needed on academic policies that affect graduate students, and take the initiative to review, clarify and modify those policies, as needed, through academic governance processes.

• A graduate level ombudsperson will be a resource to coach students through problems and help to mediate conflicts that cannot be resolved in the student’s department or college. When necessary, this ombudsperson will guide students through the grievance process. The ombudsperson will be a resource to help identify gaps in academic policies as they relate to graduate students.

• Create a PhD student handbook that focuses on the activities students need to navigate their Northeastern experience successfully. Examples are guidance for the moving-in process, the academic process, choosing an advisor, choosing a research topic, resolving conflict, pointing to resources, etc. This handbook will clarify expectations for the student-advisor relationship; describe leave policies; detail expectations of a research position; grievance procedures; and any other activities that involve PhD students enrolled in the university.

• Provide professional development support in every stage of the PhD process: proposal writing, applying for fellowships and grants, presenting, publishing, dissertation development, and job seeking.

• Provide the infrastructure to organize, collect, and share data about our PhD programs along the performance metrics (described in II) together with benchmarking data from aspirational schools, in order to facilitate monitoring and progress toward our goals.

• Gather and maintain an up to date database of post-graduate contact information along with information about our graduates’ professional careers.

• Support specific activities that contribute to a culture of scholarship, such as the creation of stronger inter-university relationships (described in VIII), experiential learning that goes beyond the academy (described in V), and the mentoring of undergraduate students with research interests.

• Provide support for the PhD Professional Development Passport described in (IV). The passport will be a centrally organized professional development program to offer students professional training opportunities in several areas. This credit bearing passport program will leverage resources from across the university in its design and implementation.

Visionary Action Steps (Bold Ideas):

• Offer the centralized unit as a home to nurture existing and new interdisciplinary and multidisciplinary PhD programs.

• Burlington Graduate Student Village (including family housing) - Take advantage of the university and the Northeastern Innovation Campus at Burlington to create a vibrant and
sustainable community for graduate students and their families with a shuttle service to and from campus. When appropriate, training activities will be linked to the ongoing activities at the Innovation Campus.

- Develop a Family Resource Center to support the intersection of family and doctoral work - Fully recognize that many PhD students are also parents, spouses and caregivers to family members, and provide resources to help students achieve balance in their busy and diverse lives such as access to lactation rooms, day care facilities, etc.

- Graduate mentors in undergraduate housing - Offer graduate students opportunities to serve as live-in academic mentors in undergraduate dorms. In exchange for developing cultural and academic programming, competitively selected graduate students would receive free housing.

- Offer competitive post-doctoral or pre-doctoral research funding for students whose research requires additional time for development, particularly in interdisciplinary areas. Such funding will also assist talented students in a challenging academic job market.
VIII. Promote innovation in program design

**2025 Goal:** Actively encourage the creation of novel PhD programs and educational experiences that take full advantage of our research capabilities, our collaborative approach to scholarship, our distinctive educational model, and our superb location in Boston.

**The Opportunity:** Over the past several decades, PhD programs around the world grew increasingly specialized, gaining in depth within a given field, but often distancing themselves from ideas, theories, and concerns coming from other fields or practitioners. At the same time, our society began to realize that many of the most important problems we face are interconnected and cannot be resolved using only the tools and knowledge of any given field. Northeastern is uniquely positioned to unleash the power of novel, cross-disciplinary work by allowing and encouraging the creation of innovative PhD programs that take full advantage of our internal capabilities and those of other universities, research institutions, and non-academic organizations, which will increasingly seek to partner with us.

**Visionary Action Steps (Bold Ideas):**

- **Leveraging Boston with Cross-University Collaborations for PhD Programs.** Northeastern will take full advantage of its entrepreneurial and ambidextrous approach by promoting PhD-level collaboration with other schools that can enhance the educational experience and peer connections of our students. This is particularly easy to visualize in our main Boston campus, which is surrounded by many research universities that face the same challenges that Northeastern faces in their PhD programs: small numbers and high cost per student. Taking this common reality as a starting point, and taking advantage of the ever-increasing reputation, quality and academic connections of our research faculty and our superb location, Northeastern will spearhead the creation of collaborative arrangements that will benefit all participating schools, such as cross-registration agreements, joint seminar series, and joint research projects. Emphasis will be placed on creating these bridges with the strongest research schools.

- **Create Pathways for Alternative Dissertations.** PhD programs will have the option to offer students alternative dissertations. These alternative dissertations may include, for example, multi-media presentations, graphic novels, or a compilation of journal papers. PhD programs choosing to offer an alternative dissertation will incorporate a proposal into the academic milestones. This proposal should clearly indicate how the alternative dissertation provides a more effective venue to communicate the expected learning outcomes of the PhD research, while still maintaining the high academic standards and expectations associated with a PhD degree.

- **Ambidextrous PhD Programs**
  1) **An Illustrative Example:** Northeastern will design novel cross-disciplinary PhD programs that will excel both in their academic value and prestige, and in their value outside the
academy -- hence, we use the term ambidextrous, as they will simultaneously and successfully serve scholarly and practitioner audiences. These will be designed around areas where Northeastern has gained or can credibly gain expertise thanks to outstanding research by faculty in the different colleges. Figure 1 below shows one such example of a PhD program created around Cybersecurity. This program will bring together selected faculty from multiple colleges in an innovative design that will combine relevant experiential components with guided multidisciplinary doctoral research.

![Diagram of Ambidextrous PhD program design around cybersecurity.](image)

The program will be sponsored by a large group of companies who have particular interest in Cybersecurity, either because they are at the forefront of cybersecurity protection and research or because they face significant cyber vulnerabilities that can be very costly. These companies will provide financial support in the form of a small annual membership and also by hiring the students of the program for specific projects, particularly during their first year. Students who join the program will therefore spend a good part of their first year working on specific projects within multidisciplinary teams addressing challenges posed by the member companies. Students will move on and off projects based on their expertise. During this first year experience students will gain key insights of the challenges and open questions in cybersecurity. Students will work in and lead teams. Together, the first year projects, team activities, and coursework, will provide the technical basis for students to achieve expected
learning outcomes, acquire important career and leadership skills, and be poised for relevant PhD level research. This direct experience in the general topic of their PhD will inform the specific research that the student will pursue at Northeastern starting in his or her second year. Member firms will have no direct influence on the academic research, but their participation in meetings and through the internship program will help inform the broad research agenda.

2) Designing for Success. To have the potential to advance the reputation of our PhD programs and to be financially viable, ambidextrous PhD programs must be designed with deliberate attention to the priorities of all stakeholders. It is well recognized that the two main reasons outside organizations are motivated to support and engage with the university is access to valuable findings coming out of relevant research and access to a highly qualified future workforce. An ambidextrous PhD program should ensure that both the partners’ main concerns and interests, and the university’s interests and agenda, are taken into consideration. The rewards and objectives of the partners must be clear to all stakeholders, and the degree of control or influence on the definition, scope and progress of the outside partner-based projects and academia-based research must be clearly defined. This will be most successful when implemented in a way that allows our partners to derive tangible short-term benefits and also allows the PhD students and faculty to retain their academic freedom in pursuit of their research agenda.

3) Innovative Pedagogical Pathways. The ambidextrous PhD program compels the examination of some basic pedagogical approaches, and it will force us to think outside the box regarding how to provide PhD education in nontraditional ways. We will need to ask ourselves questions such as:

- Can intense team-based projects replace some coursework requirements?
- Can this type of program be a mechanism to engage outside partners with us to create a new education model and research partnership?
- How can we assess learning?
- How do we balance the needs and goals of our partners with those of academia?
- Can we think differently about team projects and independent studies in order to create pathways that transcend the traditional “semester” schedule?
- Should the learning objectives and outcomes of these novel PhD programs be different than in more traditional ones?