Northeastern University’s College of Engineering  
2025 Strategic Plan

Mission:

- The College of Engineering’s mission is to educate students for a lifetime of continued growth, fulfillment and accomplishment, and to create and translate knowledge through transformative research to address the Engineering Grand Challenges to meet global and societal needs through innovation.

Vision: Engineering for Society

- COE has a bold vision to be a worldwide leader in innovative experiential engineering education to produce 21st century engineers who are technically strong, multidisciplinary, multifaceted, and capable of innovation that will advance and create value for society. The College strives to be a global powerhouse in translational, transformative, interdisciplinary and convergent research in focused areas that develop solutions to meet societal needs.

- COE’s 2025 Strategic Plan aligns with and contributes to Northeastern University’s 2025 Academic Plan, which is a blueprint to lead a revolution in higher education that ensures the era of intelligent machines is one of expanding opportunity, and one that integrates and elevates its human and technological capabilities to meet the global challenge of our time: building sustainable human communities.

- To continue to revolutionize engineering education to prepare students to address the Engineering Grand Challenges of the 21st century, COE will emphasize a technical and broad-based educational experience, to develop the next generation of engineering innovators. The College’s educational model will be uniquely defined to ensure students have not only depth of technical expertise, but also a broad interdisciplinary/convergent foundation, including in engineering and complementary university-wide academic and experiential areas, which is enhanced by emphasis on the development of various crucial competencies: innovation addressing the world engineering grand challenges and creating significant value for society, entrepreneurship and business, service and community engagement, and a global and multicultural mindset. COE’s educational initiatives focus on providing personalized learning opportunities and enhanced educational delivery, extending the definition of experiential education through expanded co-op and other experiences, including hands-on projects and innovations in and outside of the classroom, and providing technical competence within the global societal context. Additionally, the College’s transformative research is use-driven, grand-challenge focused, and interdisciplinary/convergent in core areas to meet societal and global needs. The following are COE’s strategic initiatives that contribute to the Northeastern 2025 Academic Plan and support the College’s vision.
I. Provide Personalized Learning Opportunities and Enhanced Educational Delivery

I.A. Provide “just-for-you” Learning:
To create agile, resilient, and motivated learners who are capable of innovation and creating change by learning without borders, the College will continue to enhance interdisciplinary/convergent education programs, providing a technical and broad-based educational experience. In fact, with enhanced flexibility of curricula, COE has seen a significant increase in 2016 as compared to 2012 in the number of students with non-COE minors. The College will continue to develop both undergraduate minors and combined majors, and graduate degree and certificate programs that are stackable and able to be integrated with other learning experiences, degrees, minors, and programs. For example, the innovative ALIGN program opens opportunity for undergraduates of non-engineering fields to pursue engineering graduate degrees. Other examples include the Mechanical Engineering and Chemical Engineering MS degrees, which can be combined with the majority of COE’s graduate certificates without requiring additional credits. Additionally, the College will implement a Grand Challenges Scholar program, whereby students will have the opportunity to earn a certificate by demonstrating competencies in five areas. Competency areas include: a hands-on project focused on one of the National Academy of Engineering (NAE) Engineering Grand Challenges, interdisciplinary skills, global experiences, service learning, and entrepreneurship. To enhance multidisciplinary and experiential engineering education, COE will expand opportunities for integrated interdisciplinary/convergent team and project-based learning in and outside the classroom, such as in capstone projects and student club activities.

To further personalize learning, COE will enhance its advising ecosystem using personal advising as well as technology and digital media with a focus on individualized learning programs that support interdisciplinary degrees and experiential learning, are shaped to prepare students for post-graduation and lifelong learning plans, and account for prematriculant learning experiences (for example, college-level courses for high school students, transfer and advanced placement credits, and industry-based coursework for advanced standing). The College will also continue its efforts in developing a sense of community, understanding and meeting evolving student needs, and providing guidance and mentoring to assist students in reaching individual objectives.

In addition, traditional learning pathways will be complemented with shared learning experiences and lifelong learning opportunities. The College will promote seamless transitions between degree programs and other learning experiences by offering integrated degree and certificate programs, such as the Galante Engineering Business Program.

How, when, and where education is delivered will continue to evolve. The College will develop “return loop” pathways for alumni to re-engage with the College for career- and skill-building workshops, boot camps, and courses that serve as pathways for other learning experiences in COE via online, regional campuses, or Boston-based graduate certificates and/or degrees. The College will also continue to expand graduate program offerings at regional campuses and offer flexible delivery solutions to meet the needs of working professionals.

I.B. Enable Learning Tailored by Advancements in Technology:
COE has the knowledge and skills to be at the forefront of technology education for all of the University’s students. We live in a data- and technology-driven world; no student should be without a fundamental understanding of the most important aspects of technology, including learning how to adapt to inevitable technological changes and advancing technologies throughout one’s lifetime. COE will continue to advocate for technology literacy inclusion in future core curricular innovations by partnering with the university’s various colleges. Additionally, COE will improve technology platforms for instructional delivery and deliver learning content in the most technologically advanced and appropriate methods available. The College’s faculty will be skilled in teaching innovation and achieving problem- and project-based learning, as well as delivering engaging online courses to provide an outstanding, pedagogically effective learning experience for our remote/mobile students.
II. Extend the Definition of Experiential Education

II.A. Offer Co-op and Other Experiences Customized by Design:

To provide flexible options to existing semester-based timelines and rigid course and program structures, COE will seek opportunities to link traditional semester-based periods of study with other, variable-length learning experiences for undergraduate and graduate students. The College will bring additional experiential learning into the classroom, as well as continue to develop unique opportunities and experiences for co-op, international study, research, and service-based learning. Knowledge from students participating in these programs will be shared with other students and will also contribute to enhancing the College’s curricula.

To create co-op and other experiential learning opportunities that are more flexible and open to a broader sector of the COE community, including alumni and working professionals, as well as be more closely integrated with learners’ needs, COE will implement a more holistic view of co-op employer relationships. Co-op will be the foundation for, or an outgrowth from, other interactions such as joint or industry-funded research, and continuing education or advanced standing credit for employees and alumni. These will be developed in collaboration with industry and involve more out-of-region and international opportunities for students and faculty.

Student life experiences will be included in credit-bearing experiential education. COE will leverage its extensive set of student clubs, such as Generate and Enabling Engineering, and professional society student chapters to contribute to a co-curricular set of learning experiences, while maintaining the College’s rigorous academic standards. An expanding set of graduate student organizations and activities will add to this robust co-curricular ecosystem. With a significant number of student organizations already in place and growing, the College will continue to invest in providing student organizations with facilities and resources, such as maker spaces and renovated facilities.

COE will also focus on programs that develop entrepreneurship, business, and leadership skills. The College will continue to offer and expand programs and activities within the College, as well as support and contribute to interdisciplinary University programs that converge business and engineering knowledge through degrees, certificates, experiential education, research entrepreneurship, and student organizations. For example, COE’s Sherman Center for Engineering Entrepreneurship Education collaborates with the university’s Idea venture generator program, and COE partners with the Gordon Institute of Engineering Leadership to provide engineering leadership and product development experiential education integrated with master’s degrees in all disciplines. With COE’s Galante Engineering Business Program, students can apply courses taken toward an MBA at Northeastern. Additionally, COE offers research entrepreneurship opportunities, and endorses sabbaticals for faculty working in industry settings, including at their own start-ups.

II.B. Provide a Doctoral Education Integrated with Experience:

COE will continue to offer a doctoral education that integrates experiential education such as industry/government experience/collaboration, and high-end engineering science academics. The College will expand the experiential opportunities that it is already offering to its PhD students in part by using the successful co-op program in place for master’s degree students. Experiential opportunities are most effective when interactions between COE and industry or government agencies make this interaction mutually beneficial. The College is committed to having a holistic relationship with industry, government, and other institutions, which includes co-op, research, alumni engagement, and career support for alumni.

II.C. Embrace Employer and Alumni Connections:

To integrate employer and alumni global networks as sources of lifelong learning, teaching, mentoring, innovation, and career opportunities, COE will facilitate collaborative networking capabilities, as well as create a robust methodology for developing learning outcomes for co-op and other experiences that engage employers through mutually beneficial programs with documented experiential learning requirements.
III. Create Technical Competence in Global Societal Context

III.A. Provide Intercultural Hubs for Learning and Discovery:

The College will provide a rigorous experiential education that prepares students for the world and meets the growing demand for an engineering education, as evidenced by increased and/or sustained undergraduate/graduate conferrals, graduation rates, and job placement rates. Through extended experiential education, project-based work, and service learning, COE will continue to build global societal context into technical education. A myriad of programs will create more opportunities for students to participate in global learning experiences, broadening their perspectives by exposing them to additional international environments, challenges, and cultures. COE will expand the range and impact of global experiential learning to include additional short-term experiences such as Dialogue of Civilizations, short-term internships, summer research, or co-op combined with a traditional semester abroad or longer co-op. The College will also seek international partnerships, such as for longer-term study abroad opportunities in accredited programs, to promote global engineering careers and experiences. Capstones and other project-based courses will seek opportunities for international participation, mentoring, and advising using technology and prior international experiences as the basis for project identification and interactions.

III.B. Create Agile Networks Powered by Diversity:

Learning networks of diverse ideas, experiences, and perspectives—activated by inclusivity—strengthen professional, intellectual, and cultural agility. COE will continue to recruit highly qualified students and faculty from around the world, while increasing its diversity through initiatives such as the Student Pathways Opening World Energy Resources (S-Power) program. S-Power, funded by the National Science Foundation, recruits and supports college transfer students from underrepresented backgrounds who are studying and doing research in energy. COE will further develop articulated partnerships with regional community colleges (RCCs), Historically Black Colleges and Universities (HBCU), and Hispanic Serving Institutions (HSIs).

To increase diversity, inclusion, and diversity retention, a Diversity and Inclusion initiative will cut across all aspects of COE’s enterprise: faculty recruitment, hiring, and mentoring; staff initiatives; student recruitment and representation; and activities. With a commitment to multidisciplinary education, the College will engage with and support students, programs, and activities from other colleges working collaboratively with COE. All aspects of the College’s learning community will be represented on a Diversity and Inclusion Committee that will develop and implement activities, training, and policy enhancements to further promote diversity.

COE will continue to strengthen and build partnerships with global co-op employers and foreign institutions and researchers to allow for more multidimensional relationships that include traditional co-op placement, as well as research collaborations, such as the Puerto Rico Testsite for Exploring Contamination (PROTECT), funded by the National Institutes of Health. New offerings in workshops, skills retraining, and short courses for COE’s co-op and industry partners’ employees will provide increased opportunity for lifelong learning.

Through immersive experiences in the College’s research centers, Center for STEM Education, local and international service learning-based project work in courses, and numerous student group activities, COE will continue to build its capacity for community engagement locally, nationally, and globally to advance society through innovation, and build the STEM pipeline.
IV. Lead Transformative and Convergent Research

IV.A. Enable Discovery and Innovation Freed of Traditional Limitations:
The College will continue to build out convergent, transformative, and translational research to address the Engineering Grand Challenges of the 21st century and meet societal needs. COE will enhance and redefine new emphasis areas within the foundational research themes of health, security, and sustainability, with a strong focus on use-driven, socially-impactful, and globally critical thrusts. The College will focus on seven identified research initiatives. COE will also continue to adapt to focus on timely and relevant interdisciplinary/convergent topics, including Human Centered Robotics and the Internet of Things. The College will revisit these research areas and adapt them to meet evolving world challenges.

To accomplish its research objectives, the College will continue to promote a world-class and convergent research culture and support research leadership that engages faculty, integrates disciplines, and accelerates research impacts; hire and support the world’s most accomplished and promising faculty in research; provide state-of-the-art laboratories and computational environments; and encourage faculty and students to pursue research entrepreneurship opportunities.

To further research capabilities, COE will expand its burgeoning global research networks. The College will continue to break down the traditional barriers of academic research between disciplines, across the university, between universities, and between academia and industry. With industry connections through our established co-op program and other sources, the College will continue to expand its research partners and diversify its sources of research funding beyond a primary dependence on government agencies, and promote collaborative grants among academia, industry, foundations, and national laboratories. COE will also strive to increase the innovation and translational aspects of its research through patents, licensing, and commercial spinoffs from its faculty’s laboratories and students’ innovations. To foster interdisciplinary/convergent academic and research collaboration and increase its impact on solving real-world challenges through research, COE will enhance the creation of partnerships among disciplines, institutions, and sectors, and thus its grand challenge/center-based research.

IV.B. Widen the Network of Faculty Innovation:
The College will continue to recruit and retain accomplished faculty to further build its status as a powerhouse in research in focused areas, and to deliver a superior—yet evolving—personalized education focused on teaching innovation in its various existing and future academic majors and minors for the preparation of the next generation of engineering leaders. COE has begun sabbaticals for faculty working in industry settings, including at their own start-ups. This will continue and expand with faculty at companies, government agencies, and foundations with which COE is building holistic partnerships. Engineering is uniquely positioned for joint appointments of faculty in academia and industry, and COE will promote additional affiliated faculty, Professor of the Practice, and Executive-in-Residence positions on such opportunities. A professional and motivated staff is also important for the College to reach its long-term objectives. COE will continue to provide professional development, training, and morale-building opportunities to maximize the stability, career progression, and evolving skills requirements of its staff.

IV.C. Novel PhD Programs Aligned with Emerging Fields:
COE will elevate the excellence and impact of its doctoral programs with increased support for unique PhD programs that personalize the learning experience, provide professional development to prepare students for diverse careers, and take advantage of its expanding research capabilities, collaborative and interdisciplinary/convergent approach, and holistic educational model. Our The College’s PhD programs will provide students with a deep understanding of industry problems, societal issues, and disciplinary knowledge. This approach will prepare doctoral students to synthesize across disciplines and develop the skills needed to carry out impactful research that creates new knowledge to solve the Engineering Grand Challenges of the 21st century and advance society.

IV.D. Educating the Next Generation of Innovators; Engineering for Society:
Through a transformative educational model, combining classroom learning, research, and experiential learning, COE will strive to develop a workforce capable of meeting the Grand Challenges of an ever-evolving and complex world. In addition to strong technical skills, COE graduates will be equipped with innovation, multidisciplinary, and multifaceted skills that will enable them to meet the 21st century’s societal needs.