

BUILDING ON TRADITION FOR TOMORROW: ENGINEERING OUR FUTURE TOGETHER

A Vision for Drexel Engineering 2025



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BUILDING ON OUR FOUNDATION

Drexel's College of Engineering has arrived at an inflection point as the world around us evolves. The program that began as Drexel's first bachelor's degree offering in 1914 — and later launched co-op education with just 152 engineering students in 1919 — continues today as the University's flagship, with over 3,500 students and a place among the nation's top private engineering programs.

It is my honor to lead our engineering community, and I am pleased to share with you our latest strategic plan. By nature, this planning effort has served as a critical mechanism of self-assessment and reevaluation of our college's mission and goals. This valuable exercise has also only heightened our awareness of the unprecedented situation facing higher education, particularly as society is challenged by a pandemic, responds to issues of social injustice, and faces environmental and technological challenges. It is clear we must focus our acute attention on these issues, further emphasizing the crucial need for us to build on a shared vision of how Drexel Engineering will foster sustainable advancements as a citizen of the University, the region, the nation and our world.

What remains paramount is that we deliver the best academic and workplace experiences possible while remaining mindful of the safety and wellbeing of all of our students, faculty and staff. Drexel Engineering has a rich history of leadership in engineering education, and now more than ever we must remain flexible and responsive in adapting our curricula and support systems to meet new student and workforce needs.

From the beginning, we sought to make the strategic planning process as inclusive and transparent as possible, from hosting one-on-one interviews and focus groups beginning in January 2019 to convening planning committees and college-wide open forums through the subsequent winter quarter. What follows is the culmination of more than one year of conversations, planning and collaborative effort of our faculty, staff, students, alumni and friends. I am proud of the work we have done together and am deeply grateful to all of the stakeholders who have engaged

in this process; I am grateful, too, to my predecessors, Dr. Joseph B. Hughes, who led the college through its previous strategic planning effort, and Dr. Guiseppe Palmese, who served as interim dean during a period of transition.

Now we must forge ahead, regularly reexamining, renewing and revising our efforts to adapt to shifting tides. To that end, everything from our academic degree and research programs to our administrative and financial operations will be guided by the call: to respond efficiently to rapid change; to provide the tools and approaches for maximum impact on creating a sustainable future; to promote collaborative engineering solutions; and to advance engineering education through pedagogical research. These emerging themes are part of a continuing conversation that builds on our past and paves the way for our future — this is a new beginning. This is how we will deliver on our mission, how we will provide a distinctly Drexel Engineering experience and how we will build on our tradition for a better tomorrow as we collaborate and innovate together.



Sharon L. Walker, Ph.D.

Dean and Distinguished Professor





DREXEL ENGINEERING MISSION

Our mission is to cultivate technically and theoretically trained adaptable engineers who are dedicated to discovery and the application of technology, and who understand the global, social and ethical implications of creating sustainable solutions to societal challenges. We will achieve this through the production of robust research and the meaningful integration of emerging engineering approaches and innovations across digital, human and physical platforms.

OUR VISION

As the cornerstone of Drexel University, we will reimagine the continuum of engineering research, education, and practice — strengthening and integrating all three through strategic collaborations with industry, government, and non-profit partners — to foster long-term sustainability and the cultivation of engineering talent across diverse local and global communities.

OUR CORE VALUES

EXCELLENCE

Ensure that all aspects of our pedagogy, research, administrative operations and outreach are of excellent quality, embodying the highest standards of knowledge, inquiry, academic freedom, integrity and service.

STUDENT CENTEREDNESS

Provide for the personal, intellectual, ethical and professional development of our students, enabling them to become leaders, to be civically engaged and to pursue lifelong development.

DIVERSITY

Value, encourage and promote all aspects of human differences, fostering a culture that welcomes a broad variety of personal circumstances and experiences, mirrors our rapidly changing world and prepares our students to be effective citizens in an increasingly interdependent society.

INNOVATION

Preserve and enhance our legacy of exploration, strategic leadership and entrepreneurial risk-taking as we discover new and better ways of anticipating and addressing society's needs and challenges.

COLLABORATION

Expand our expertise, resources and impact by working closely with all segments of Drexel as well as through partnerships and alliances internally and beyond our campus.

LEADERSHIP

Demonstrate through individual and collaborative teaching, research and administrative operations the meaningful integration of all engineering disciplines and approaches for a positive impact on long-term, sustainable solutions.

GUIDING PRINCIPLES

The following principles are at the foundation of our vision and strategy, and will guide intentional decision-making, resource alignment and investment in our people, programs, organizational structures, processes and facilities:

INTEGRATION

We will create deeper connections and alignment within departments of the college, across Drexel, and into the community beyond to ensure coherence, promote positive culture, enhance individual and organizational capacity, maximize return on resources in favor of a circular economy, streamline processes and improve efficiency. This work will involve combining or connecting functions, roles and processes that are essential, as well as pruning or “sunsetting” those which are misaligned with our broader vision and strategic choices.

INTERSECTIONS

We must maintain consistent attention to, and investment in, questions, problems and solutions that exist at the boundaries of overlapping, but distinct, domains in order to develop capacity and address the everchanging global landscape with maximum impact. Domains may include, but are not limited to: disciplines, departments or divisions/colleges; areas of learning, research and problem-solving; components of the greater community (including for-profit, nonprofit and community organizations, government agencies and other academic and research-based institutions); and disparate frameworks and epistemologies for problem-solving and the “creation of something new.”

INCLUSION

We are committed to the cultivation of the mindsets, behaviors and structures to sustain a positive culture in which all identities, talents and perspectives are recognized, valued and celebrated, and whose make-up is reflective of the demographics of broader society. We are committed to actively improving racial and social equity, as well as the quality of life for all of our community members.

INDUSTRY

We will sustain and expand our pursuit of collaborative, two-way relationships with for-profit, nonprofit and community organizations, government agencies and other academic and research-based institutions in the broader landscape beyond Drexel to inform desired learning and research outcomes, and support all aspects of research, program, curriculum and practice.



OVERARCHING THEMES

Crosscutting our comprehensive strategy, the following themes provide a framework through which we will focus our efforts:

RESPOND TO RAPID CHANGES

In response to the fast pace of innovation and knowledge development, we must create techniques for rapid curriculum renewal and setting of our research agenda.

PROMOTE COLLABORATIVE ENGINEERING SOLUTIONS

As innovation is increasingly fostered through collaborative knowledge generation, we must provide problem-based, team learning opportunities to engage students in the pursuit of solutions to society's most pressing challenges.

CENTRALIZE SUSTAINABILITY PRACTICE/CLIMATE INTO PEDAGOGY AND OPERATIONS

To address the current non-uniform treatment of environmental and social issues, we must accelerate the infusion of sustainability approaches across the curriculum, as well as in college administrative and financial operations.

TRAIN THE TRAINERS

In order to transform the engineering education experience, we must inform efforts through research while taking advantage of the opportunity to train, or retrain, the trainers.



OUR SHARED GOALS

BUILD ON OUR EXPERIENTIAL LEARNING LEGACY

To prepare our undergraduate students for the complex societal challenges that will dominate the professional world they will enter, we will more deeply integrate Drexel engineering's distinctive co-op into the classroom activities of students and faculty, as well as enhance the Drexel engineering educational experience through in-depth assessment and continuous improvement of the ways in which we teach and mentor our students. In particular, we will enrich the First-Year Curriculum and Experience to boost students' enthusiasm and improve recruitment and retention. Beyond the first year, we will strategically modify the substance and structure of the overall curriculum to promote emotional intelligence (EQ, or "emotional quotient"); to focus the attention of students on global challenges, like sustainability, climate change, the circular economy and how these issues relate to engineering; to promote applied service learning; and to enable groups of students and faculty to focus Drexel engineering attention on rapidly evolving topics.

REIMAGINE ENGINEERING GRADUATE PROGRAMS

We will explore opportunities for launching new, agile degree programs and rethink the boundaries of executive and professional education. Beginning with a systematic review of current offerings, we will refocus our graduate programs to ensure they serve the needs of students and employers, including new delivery modalities. We will also identify opportunities to improve graduate recruitment and retention particularly at the master's degree level. In particular, we will leverage our deep connections with industry to revise/create relevant, forward-thinking and in-demand programs for working, professional engineers.

ENHANCE OUR RESEARCH IMPACT THROUGH COLLABORATION AND INNOVATION

To enhance the research impact of the college, we will embrace a collaborative approach that leverages our existing strengths and aims to address critical and significant societal challenges through emerging engineering methods and platforms across renewable energy and power; health, wellness and medicine; smart cities; and resource stewardship and sustainability. We seek to improve the quality of our doctoral programs to ensure competitiveness in recruiting student researchers. We will boost our translational and industry-related research footprint to improve society through research discoveries and to enable new opportunities for collaborative work. To ensure the success of these efforts, we must build a research infrastructure that is robust and agile enough to support diverse and timely research activities.

FOSTER COMMUNITY AND INCLUSION THROUGH EQ AND RENEWED SPACES

In support of the academic and community experience for all of Drexel engineering faculty, students and staff, as well as to create a more harmonious and collaborative culture, we will seek ways to enhance our collective EQ, as well as review and reinvigorate the college's physical infrastructure needs. In addition to the aforementioned curricular updates that incorporate EQ learning methods, we will provide training and growth opportunities to all members of our community to enhance our ability to identify, understand and effectively manage professional and mentoring relationships. We will reactivate and re-envision the college's committee on diversity, equity and inclusion to thoughtfully respond to issues of social injustice and affect positive cultural change. With regard to space, we seek to consolidate the college's campus footprint and establish engineering as the "gateway" to Drexel University, all while ensuring spaces align with research and innovation needs. Importantly, we are committed to implementing long-term sustainable practices as we renew and build our physical spaces.

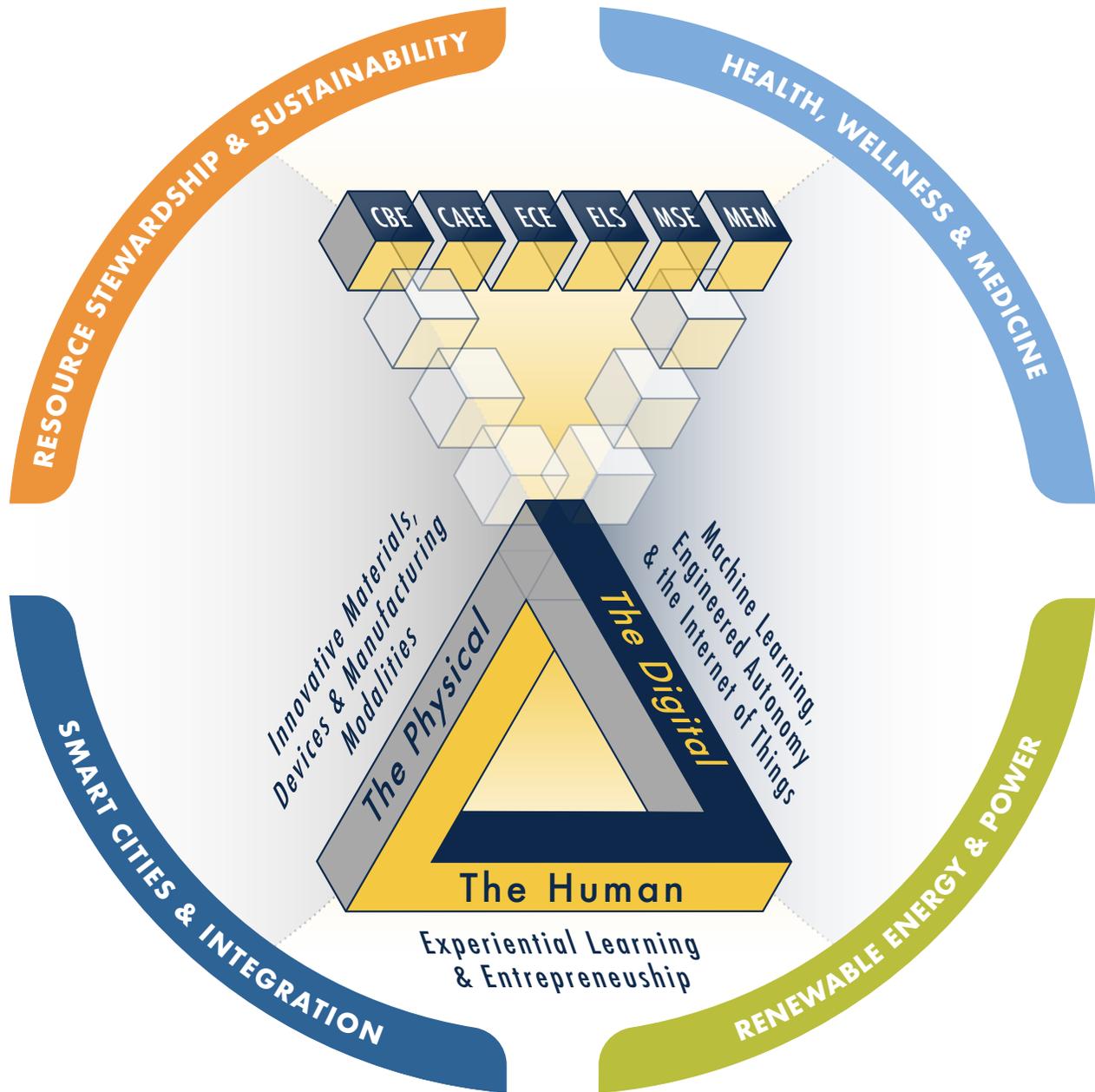


Fig. 1 *Meaningful Integration of Drexel Engineering Expertise & Thematic Goals*



FROM IDEATION TO ACTION: GUIDELINES FOR IMPLEMENTATION

The goals, themes and values outlined here are intended to serve as a guide for achieving our vision. In order for us to successfully implement this plan, our individual and collective activities should be in alignment with the broader themes, which are intended to expand — not limit — our thinking and approaches.

MEANINGFUL INTEGRATION

The world continues to evolve rapidly, from climate change and global health issues, to shifts in demographic patterns and economic fluctuations — and it is critical that the college not only keep pace with these changes but innovate and find ways to lead the advance.

Experiential learning and entrepreneurship are core not only to Drexel's brand, but to the identity and reputation of Drexel Engineering. Timely and relevant research is central to our ability to recruit and retain world-class faculty and graduate students. And our commitment to foster long-term sustainability through innovative engineering solutions is fundamental to achieving our vision.

As we prepare to implement our strategic plan, it is essential that we integrate these human, digital and physical elements across broad themes that map to our areas of expertise, as shown in Figure 1.¹

The themes do not serve to limit our approach, rather they act as a guide for everyone's short- and long-term activities, ensuring alignment of individual initiatives with the college plan.

STRATEGY STEWARDS

While select individuals volunteered to join the planning process, the successful implementation of the strategic plan will ultimately be the result of a collective effort, deployed through individuals and groups at all levels of the college, over time. These strategy stewards will facilitate our action steps toward our goals for the duration.

For example, as we build on our legacy for experiential learning, administrative leadership including department heads and associate deans will collaborate with faculty and staff on the assessment of learning and teaching, and convene curriculum and assessment committees comprised of faculty and staff to ensure shared governance; similar efforts will be mirrored with activities including, but not limited to, research, recruitment and enrollment functions, communications and marketing. Our strategy stewards of individuals and teams will also assist with college-campus collaborations and activities, such as corporate partnerships and the Vertically Integrated Projects program. In short, our current administrative structures combined with individual faculty and staff across the college will play an important role in realizing our goals.

We also recognize that implementing the strategic plan will require a variety of resources ranging from the tangible (e.g., financial) to the intangible (e.g., time, culture change). Proposed actions and feasibility based on resourcing are detailed in supplemental documents internal to college faculty and staff.

¹ Department acronyms are used as follows: CBE-Chemical and Biological Engineering; CAEE-Civil, Architectural and Environmental Engineering; ELS-Engineering, Leadership and Society; ECE-Electrical and Computer Engineering; MSE-Materials Science and Engineering; MEM-Mechanical Engineering and Mechanics.



MEASURING SUCCESS

Beyond implementing our strategic plan, we must have a mechanism for marking milestones toward achieving our goals and vision, as well as plan for adjusting and fine-tuning as we move into the future.

SHARED GOALS — INITIAL ACTIONS

The following preliminary action plan, built around our shared goals, serve as foundational blocks for achieving our strategic objectives.

BUILD ON OUR EXPERIENTIAL LEARNING LEGACY

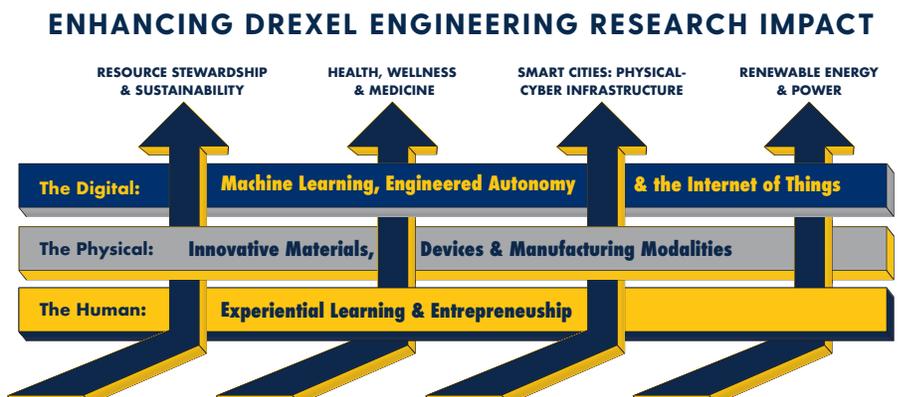
- Develop a transformative first-year engineering experience that contributes to the students' ability to create personal, economic and societal value through a lifetime of meaningful work.
 - Seek and develop partnerships that share our mission to graduate engineers with an entrepreneurial mindset.
 - Enhance coursework and establish oversight of the first-year experience with the aim of introducing students to the critical roles that engineers can play in advancing sustainable development and addressing associated global challenges.
- Enhance collaboration with Drexel's Steinbright Career Development Center and work to integrate the co-op experience with on-campus experience.
 - Identify opportunities for curricular integration of co-op work activities.
- Map college overarching themes to existing courses in all departments and design a plan to integrate themes more broadly across all curricula.

REIMAGINE ENGINEERING GRADUATE PROGRAMS

- Develop partnerships to build employer relationships and explore potential for targeted program offerings.
 - In partnership with Drexel Solutions Institute, develop bundled and cohort graduate degree/certificate programs for industry.
- Develop strategy steeped in the four thematic areas for graduate programs.
 - Review of existing master's degree programs and delivery modalities at departmental and college level.

ENHANCE OUR RESEARCH IMPACT THROUGH COLLABORATION AND INNOVATION

- Embrace our capacity to address problems and to develop tools and approaches by launching college working groups of faculty and students to create a shared understanding, with special emphasis on the intersection of the following overarching themes and platforms:
 - Renewable energy and power
 - Health, wellness and medicine
 - Smart cities: physical-cyber infrastructure
 - Resource stewardship and sustainability
- Strongly encourage and champion interdisciplinary collaboration



FOSTER COMMUNITY AND INCLUSION THROUGH COMMUNICATION AND RENEWED SPACES

- Create a Staff Assembly in Engineering (DSA-E) with the mission of advocating for the well-being and professional development of college staff as well as the shared governance of the college.
- Phased renovations to student spaces, facilities and labs including informal gathering spaces for graduate students.
- Establish a Dean's Student Advisory Council to enhance generation, solicitation and communication of ideas for community building with the student body.

OUR CHANGE AGENTS

At all stages of the strategic planning process, we have relied on the volunteerism and goodwill of members of our community. Following are descriptions of the early planning groups and work teams, formal executive committee and standing committees as well as membership (in alphabetical order) of each:

- **INTERNAL STRATEGIC DESIGN TEAM:** convened by Dean Sharon L. Walker to launch initial dialogue with consultant Greenwich Leadership Partners and to develop a general process overview, projected timeline and milestones, and an initial strategy draft. This team also conducted one-on-one interviews with key stakeholders as well as an online survey of engineering alumni.
- **STRATEGIC PLANNING EXECUTIVE COMMITTEE:** Tasked with maintaining momentum and communication across all channels, ensuring a valuable feedback loop across teams and all college stakeholders. Members include the co-leads of each work team as well as the initial group of the college's internal strategic design team.
- **ORIGINAL WORK TEAMS:** As part of the early community-wide effort, work teams addressed broad thematic areas to provide a framework for the college in Phase 1 of the strategic planning effort:
 - *Cultivation of People:* assessed and offered recommendations for how we will improve the quality of the student and faculty experience; effectively recruit, support and develop talent and EQ among all faculty, staff and students and for industry; and prioritize diversity, equity and inclusion in all that we do.
 - *Distinguishing Value Proposition:* reviewed contemporary critiques of engineering education and identified ways to: develop and deliver relevant programs, curricula and pedagogy in response to global challenges; reimagine and expand COOP and industry partnerships; and identify and pursue areas of research excellence.
 - *Aligned Means and Conditions:* assessed the big picture items and proposed ways we will integrate the organization to execute on vision (structures and processes); improve and leverage physical assets (real estate and facilities); and increase funding (internal and external).
 - *Standing Student Committee:* represented the undergraduate and graduate student perspective.
- **REVISED WORKING GROUPS:** Following the Fall 2019 retreat, work teams focused on ongoing discussions around thematic areas and points of overlap. With the intention to do a deeper dive, the original teams reorganized into the following new groups:
 - *Curriculum and Pedagogy:* Address the ways in which we teach and mentor students and prepare them for the complex societal challenges that will dominate the professional world they will enter.
 - *Graduate Programs:* Explore opportunities for launching new degree programs and rethinking the boundaries of executive and professional education.
 - *Research and Innovation:* Identify collaborative themes, and the actions and incentives required to sustain and continue performance, while ensuring activities align with University objectives.
 - *Space and Culture:* Review the college's physical infrastructure needs, renovation plans, and use of space, as well as explore ways to create a more harmonious and collaborative culture to support the overall academic and community experience for faculty, students and staff.

GROUP AND COMMITTEE MEMBERSHIP

INTERNAL DESIGN TEAM

- Sharon L. Walker
- Michele Marcolongo*
- Kathryn Meier
- Linda Lee
- Ian Marcus

STRATEGIC PLANNING EXECUTIVE COMMITTEE

- Jennifer Atchison
- Jason Baxter
- Jeffrey Birou*
- Linda Lee
- Michele Marcolongo*
- Ian Marcus
- Steven May
- Kathryn Meier
- Franco Montalto
- Antonios Zavaliangos

ORIGINAL WORK TEAMS

CULTIVATION OF PEOPLE

- Co-leads: Jason Baxter, Jeffrey Birou*
- Members: Yaghoob Farnam, Grace Hsuan, Lunal Khuon,* Dan Luig,* Jennifer Matthews, Dorilona Rose, Kathleen Short, Matthew Stamm, Leena Shevade (graduate student representative), Prem Patel *(undergraduate student representative)

DISTINGUISHING VALUE PROPOSITION

- Co-leads: Jennifer Atchison, Steven May, Franco Montalto
- Members: Leslie Champion, Nicholas Catucci, Haley Dervinis, Bradley Eshleman, Richard Grandrino, Vincent Hatton, Sarit Kunz, Ekaterina Pomerantseva, Maureen Tang, James Tangorra, Christopher Weyant, Mi Thant Soe (graduate student representative), Elvira-Marie Mikhael (undergraduate student representative)

ALIGNED MEANS AND CONDITIONS

- Co-leads: Linda Lee, Antonios Zavaliangos
- Members: Charles Cook, Eugenia Ellis, Kristin Imhoff, Kenneth Lau, Bahram Nabet, Nathan Schweizer, Rosie Sullivan, Yenneeka West, Asia Sarycheva (graduate student representative), Clara Fancher (undergraduate student representative)

STANDING STUDENT COMMITTEE

- Kerianne Chen
- Cosmin-Constantin Popescu
- David Hanna
- Sean Kennedy
- Celine Khoo
- Asa Lewis
- Quentin Pleier
- Abinishaa Sivaraj
- Evan Smith
- Karly Soldner
- Tianna Williams

REVISED WORKING GROUPS

CURRICULUM AND PEDAGOGY

- Co-leads: Jennifer Atchison, Jason Baxter, Ian Marcus, Franco Montalto, Steve Wrenn
- Members: Charles Cook, Brad Eshelman, Clara Fancher, Grace Hsuan, Kristin Imhoff, Elvira-Marie Mikhael, Sarit Kunz, Leena Shevade, Mi Thant Soe, Christopher Weyant

GRADUATE PROGRAMS

- Co-leads: Kapil Dandekar, Linda Lee, Wei Shih, Antonios Zavaliangos
- Members: Yaghoob Farnam, Gary Friedman, Richard Grandrino, Ken Lau, Sherry Levin, Matt McCarthy

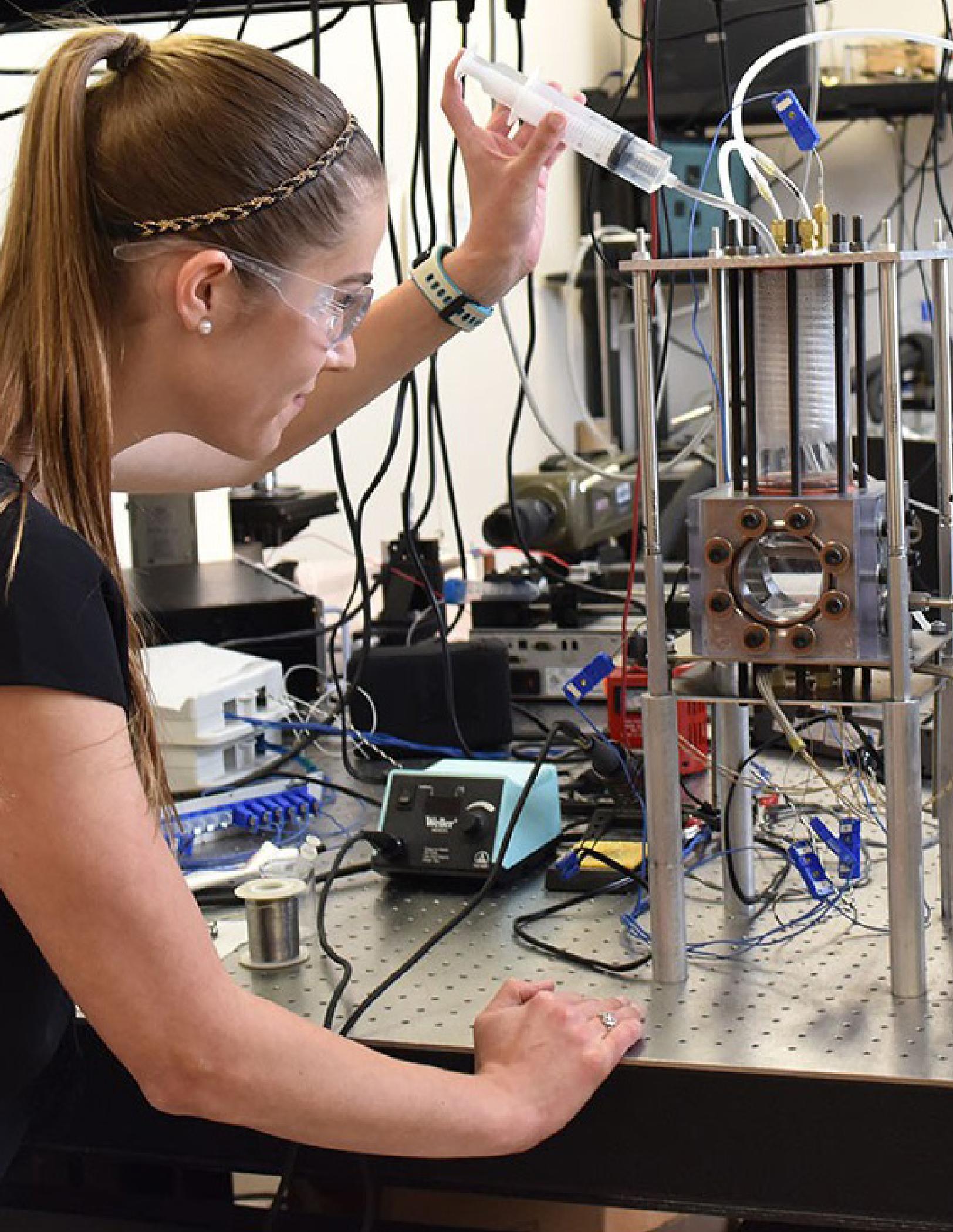
RESEARCH AND INNOVATION

- Co-leads: Jeffrey Birou,* Steven May, Chad Morris, Caroline Schauer
- Members: Leslie Champion, Nicholas Catucci, Sanjog Karki, Ekaterina Pomerantseva, Yenneeka West

SPACE AND CULTURE

- Co-leads: Michele Marcolongo,* Kathryn Meier, Gena Ellis, Wayne Hill
- Members: Haley Dervinis, Dan Luig,* Bahram Nabet, Dorilona Rose, Nathan Schweizer, Vincent Hatton, Kathleen Short, Rosie Sullivan

An asterisk (*) denotes individual no longer works at Drexel at time of publication.





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