



DEAN, COLLEGE OF ENGINEERING

Drexel University: An Overview

Drexel University is one of the most innovative, exciting, and entrepreneurial research universities in America today. Founded in 1891 by Philadelphia financier and philanthropist Anthony J. Drexel, and long considered a strong regional university, Drexel is now recognized as a national research university with global reach and a worldwide leader in experiential education. Drexel is ranked 86th among research universities by *U.S. News & World Report* for 2011, and second in their list of “Up and Coming National Universities” for “promising and innovative changes in the areas of academics, faculty, and student life.” The National Science Foundation and the 2009 Lombardi Report also rank Drexel among the top 50 private comprehensive research universities.

Drexel’s recent history is one of significant, unparalleled growth. In the past decade, under the leadership of the late President Constantine Papadakis, the University acquired a College of Nursing and Health Professions, a School of Public Health, and the nation’s largest private medical school. It built a law school that just graduated two classes and is on track for on-time, full accreditation at the earliest possible juncture. It developed an online division that now serves more than 3,700 students across 75 programs; and it opened a Graduate Center, offering eleven degrees from six different colleges, in Sacramento, California. Even as it has acquired or built professional schools, Drexel has grown the undergraduate programs throughout the University in both quantity and quality. The institution has accomplished all this while increasing the size of its endowment, earning top bond ratings, and producing large and growing operating surpluses and total net assets. With the arrival in 2010 of President John Fry, Drexel is well-positioned to sustain and capitalize on its ascent into the ranks of the world’s most distinguished interdisciplinary research universities.

The University’s academic programs are organized into twelve colleges and schools, employing over 1,200 full-time faculty members: Antoinette Westphal College of Media Arts and Design; College of Arts and Sciences; Bennett S. LeBow College of Business; School of Biomedical Engineering, Science and Health Systems; College of Engineering; Goodwin College of Education and Professional Studies; College of Information Science and Technology; Earle Mack School of Law; School of Public Health; College of Medicine; College of Nursing and Health Professions; and the Pennoni Honors College. Within these colleges and schools, Drexel offers 80 bachelor’s, 76 master’s and 32 doctoral programs, a doctor of medicine program, a juris doctor program, and 23 graduate-level certificate programs. The University’s co-operative

education program for undergraduates, in which students alternate periods of on-campus study with full-time employment in related fields, is one of the nation's oldest, largest, and most highly regarded. Through their experiences in co-op, internships, practica, service-based learning, applied undergraduate and graduate research opportunities, and project-focused courses, Drexel graduates enter the work force prepared from day one to succeed in complex and rapidly-changing professional environments.

With more than 23,000 students on its three Philadelphia campuses, Drexel is the nation's 16th largest private university. Students come from all 50 US states and more than 100 foreign countries. Twenty-five percent of students are international. The median quantitative reasoning and reading comprehension SAT scores of the 2009 freshman class total 1207, with a median high school GPA of 3.5; four hundred entering Honors freshmen boast a combined median of nearly 1365, with a median high school GPA of 3.8.

The University has total revenues of \$750 million and total endowment assets in excess of \$500 million. It raises an average of \$60 million in annual giving, placing it among the top 50 private universities. In 2010, sponsored research expenditures exceeded \$113 million, up more than seven-fold from \$15 million in 1996. In the last three fiscal years, Drexel has established twelve new start-up companies with 350 disclosures of new intellectual property. The University has more than 8,200 employees, making it Philadelphia's seventh largest private employer, and more than 120,000 active alumni worldwide. Drexel's alumni have a rich tradition of leadership and innovation, including the invention of bar code technology and the development of packet switching technology that paved the way for the internet.

The College of Engineering

Introduction: Since its founding in 1891, Drexel University has emphasized its strengths in engineering, science and technology to educate students to become leaders in designing innovative approaches to the complex needs of an ever-changing society. This legacy places Drexel's College of Engineering at the heart of the University's historic identity, and of its future strategic direction. The College aspires to produce the best possible engineering talent at graduate and undergraduate levels by attracting and developing a body of exceptional faculty, recognized for high-impact research and high-value education. Their dedication over the past decade has resulted in truly astounding growth in the College's research portfolio, continued advances in engineering education, growing demand for a Drexel degree, and an ever-improving regard for the contributions the College makes in regional, national and global settings.

The College is comprised of six departments: Chemical and Biological Engineering; Civil, Architectural and Environmental Engineering; Computer Science; Electrical and Computer Engineering; Materials Science and Engineering; and Mechanical Engineering and Mechanics. Collectively, these departments host 175 full-time faculty and 75 full-time staff. Twenty percent of the tenure-track faculty are women. The College offers a wide spectrum of degrees including the BS, MS, and PhD, and accelerated degree programs offering combined degrees such as BS/MS, BS/PhD, and BS/MD. In addition to departmentally-based programs, other degrees offered by the University and administered by the College include an MS in Engineering Management, and a new undergraduate Bachelor of Science in Engineering program. The

College of Engineering also offers interdisciplinary BS and MS degrees jointly with the College of Information Science and Technology in Software Engineering, as well as a joint degree with the College of Media Arts and Design in Video Game Design. The baccalaureate programs in Chemical; Civil, Architectural and Environmental; Electrical and Computer; Materials; Mechanical; and Software Engineering are accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc. The baccalaureate program in Computer Science is accredited by the Computing Accreditation Commission (CAC) of ABET, Inc.

Drexel's College of Engineering is the largest private undergraduate college of engineering in the nation and is also Drexel's largest college. As of 2009, the College enrolled 3,447 undergraduate students, 683 master's students and 478 PhD candidates. Twenty percent of these students are female. The College's 2010 freshman class was 894 students; 15% are female. The students come from 28 states and 28 countries. Their average GPA is 3.5 and their average SAT score is 1260.

An Accomplished Faculty: The College has an extraordinary record of attracting exceptional faculty who are leaders in their respective disciplines. Since the year 2000, five senior faculty and sixty-one tenure-track junior faculty have been hired into the College. Among the awards conferred on Drexel faculty during that same period are the following: thirty-five NSF CAREER awards; a NASA New Investigator award; a Human Frontier Science Program Young Investigator award; two ONR and two ARO Young Investigator awards; and a PECASE award. Within the ranks of distinguished senior and emeritus faculty are three members of the National Academy of Engineering, two Fellows of the AAAS, the current President-Elect of the IEEE, and four Alexander von Humboldt Fellows. The College supports a strong commitment to service within the engineering profession worldwide. College faculty have participated in humanitarian efforts, e.g. through Engineers Without Borders missions to central America, and through specialized engineering expertise and oversight following the calamities of Katrina and, more recently, the earthquake in Haiti.

Research Excellence and Collaboration: The College has an impressive portfolio of interdisciplinary fundamental and applied research. In the 2010 fiscal year, research expenditures within the College totaled \$28 million and the College received 118 new awards. For the first quarter of the 2011 fiscal year alone, the research expenditures for the College are \$30 million and the College has received 55 awards thus far, totaling more than \$37 million. More impressive than current figures, however, is the trajectory: in the past ten years, the College's research productivity (publications and PhDs) has tripled and its impact (measured in citations) has increased nearly ten-fold. The College now boasts internationally recognized programs in important emerging fields such as biotechnology, energy, nanotechnology, plasma medicine, materials, and robotics, and urban sustainability. The Bossone Research Enterprise Center, dedicated in 2005, is home to many of the College's research laboratories. Among them is the Centralized Research Facility, a College-led and -staffed resource of more than \$10 million in instrumentation for materials characterization and analysis, and micro- and nano-fabrication serving both Drexel and outside academic and industrial users and collaborators.

The College hosts several competitively-awarded, externally-funded and multi-investigator research centers that are addressing some of the most important technological challenges in

society. Among these, the *Materials Center of Excellence* is an extensive research collaboration involving faculty from Chemical and Biological Engineering, Materials Science and Engineering and the *Army Research Laboratory* (ARL) working in developing new polymeric materials and processes for military, commercial and consumer applications; it is supported through 2014 at Drexel by a nearly \$7 million award from ARL. The *A. J. Drexel Plasma Institute* and its initiative on *Plasma Medicine* are supported externally by grants from DARPA, NASA, the USDA, the Dept. of Transportation, and involve faculty from the College of Engineering, the College of Medicine, and the College of Arts and Sciences. The Department of Electrical and Computer Engineering houses the Center for Electric Power Engineering, whose participating faculty lead an *ONR Multi-University Research Initiative* (MURI). The Department of Civil, Architectural and Environmental Engineering is one of four participants in a multi-university and industry collaborative NIST-TIP project on *Automated Nondestructive Evaluation and Rehabilitation System* (ANDERS) for bridges. This department belongs to a consortium of institutions funded by the US Dept. of Energy to develop an Energy Innovation Hub to develop highly efficient building components, systems and models for both retrofit and new construction.

Educational Excellence, Student Engagement, and Outreach: Drexel's reputation for innovation in undergraduate engineering education has deep roots. As early as the 1980's, Drexel's development of the E4 curricular paradigm, which became a national model, led to the creation of the Engineering Education Coalitions initiative. This foundational work has been included in the Smithsonian's Institution's archives and received the inaugural Gordon Prize in Engineering Education from the National Academy of Engineering.

Graduate and undergraduate programs within the College today are attracting wide recognition following years of sustained growth and impact. A 2010 survey by the *National Research Council* placed its PhD program in Materials Science and Engineering eleventh in the US. In 2009 the *Princeton Review* recognized Drexel's interdisciplinary undergraduate program in video game development, offered jointly by the College of Engineering and the College of Media Arts and Design, as among the three best programs of more than 500 in the US and Canada.

Drexel is a leader in enhancing participation in STEM education by US citizen students: the Drexel College of Engineering ranked number 10 nationally in awarding PhDs to domestic students in ASEE's Connection report, joining universities like MIT and Harvard University. Drexel was a founding member and continues to host the Mid-Atlantic Chapter of the *Louis Stokes Alliance for Minority Participation* (LSAMP), enabling dozens of students from historically underrepresented groups pursue graduate study in STEM fields (including engineering) each year through programs such as the Bridge to the Doctorate program.

The College has a history of supporting student-led initiatives such as the Drexel Smart House (DSH), a multidisciplinary project to explore urban residential design and technologies. DSH gives students an opportunity to take ideas from concept through development and commercialization in a real-world setting. In the last three years, student teams have been awarded external research grants, including two federal EPA-P3 Phase I grants, and one two-year Phase II award for \$75,000. DSH research has resulted in provisional patent protection for two products and the creation of two companies.

The College also has a number of events, programs and partnerships intended to have a positive social impact and increase awareness about engineering. Many of these programs are funded through the NSF, including: Drexel Research Experience in Advanced Materials; Drexel University Computing Academy; Math and Science Partnership; Research Experience for Teachers in Areas of Innovation; Research Experience for Teachers in Nanotechnology; Summer Music Technology Program; the full year GK-12 programs in collaboration with the School District of Philadelphia; and Engineering Cities, the Research Experience for Undergraduates in urban engineering.

Regional Partnerships: The College of Engineering continues to play a central role in initiating, sustaining and expanding partnerships in the region that promote economic development through use-inspired and applied research and through technology commercialization. Through a \$12.5 million grant from the Department of Defense, Drexel established the *Applied Communications and Information Network (ACIN)* Center, a unique model for business incubation located in nearby Camden, NJ. In addition, Drexel was re-designated by the National Security Agency (NSA) as a *Center of Academic Excellence in Information Assurance Education*. For the last nine years, Drexel's College of Engineering has led a highly successful NSF-IGERT with its partner, the University of Pennsylvania, focused on nanoscience and nanotechnology research and education within a "two-university" and "one-campus" framework.

Since 2003 the Commonwealth of Pennsylvania has provided more than \$13 million in total to support to the *Nanotechnology Institute (NTI)* and, more recently, the *Energy Commercialization Institute (ECI)*, joint ventures among the Ben Franklin Technology Partners, Drexel University and the University of Pennsylvania. The NTI and ECI were created to facilitate technology commercialization and economic development through university-industry collaborations, and through financial support of technology-driven research collaborations among faculty from different academic institutions in the Commonwealth.

The College has assumed a leadership role in helping to address the digital divide in its urban setting. Through an \$11.3 million *Sustainable Broadband Adoption (SBA)* program supported by the US Department of Commerce's National Telecommunications and Information Administration (NTIA), Drexel's College of Engineering, in partnership with the Urban Affairs Coalition and a number of other regional not-for-profits, will facilitate Internet access, computers, and training to low-income residents and small businesses in Philadelphia. The College will develop an educational hybrid platform that merges online instruction through a portal coupled with face-to-face instruction to propel broadband adoption throughout the City.

The Role and Responsibilities of the Dean of Engineering

The Dean of Engineering reports directly to the Provost of the University, and is responsible for the overall strategic direction of the College of Engineering. The Dean provides leadership and support for research and education at the College; oversees the recruitment and development of an outstanding faculty; cultivates financial resources for the College; nurtures a culture of excellence, innovation, interdisciplinarity, and collaboration; and manages a budget of

approximately \$58 million annually, including approximately \$30 million of sponsored research. The Dean supports six department heads and the work of associate deans and administrators responsible for the areas of Faculty Development, Research and Graduate Studies, Intellectual Property Development, Undergraduate Affairs, Freshman Experience, Bachelor of Science in Engineering Program, Facilities, Recruitment, Public Relations, Marketing, Institutional Advancement, Finance, Administration and Planning, and Special Projects.

Opportunities and Challenges for the Next Dean of Engineering

1. **Grow the intellectual capital of the faculty of the College.** The College offers its next Dean the opportunity to take full advantage of the impressive recent growth in the quality of its faculty; to advance the creative, entrepreneurial culture that drives research and discovery; and to provide vision and leadership for educational innovation. The next Dean should foster an environment of the highest expectations in research and education. The Dean will be expected to work with department heads to attract and retain both junior and established faculty, and to give them opportunities to develop and contribute at every stage of their careers.
2. **Attract financial resources.** The next Dean will be expected to deepen Drexel's already strong alumni loyalties, and to sustain and enhance the critical fundraising efforts of the College of Engineering. As successful as the College has been in recent years, its ability to support its faculty and sustain the levels of programmatic excellence and creativity to which it is committed requires substantial new funding. The Dean will have the leading role in articulating these needs and bringing these resources to Drexel.
3. **Enhance physical space for teaching and faculty research.** The College of Engineering has several new buildings and a sophisticated central research facility that provide top quality space for teaching, learning and research. Additional new or renovated space is needed to enhance the quality of the research and educational environments for departments in older buildings. The next Dean will be asked to identify resources to improve physical facilities, to prioritize the development and upgrading of space, and to direct renovations on a complex urban campus while minimizing disruption of the ongoing life of the College.
4. **Seek opportunities for multidisciplinary collaborations between the College of Engineering and other Schools and Colleges within Drexel.** Drexel's foundational focus and culture has always been in engineering and applied science and technology. As the University has expanded considerably, adding new schools and colleges to become a truly national comprehensive university, the College of Engineering will continue to represent a powerful center of gravity within the institution. The next Dean will be expected to advance the College and the University as a whole by forging programmatic, educational and research partnerships with other schools. The College's capacity for growth and distinction is significantly enhanced by these collaborative opportunities – of Engineering with, for example, the College of Arts & Science, the Westphal College of Media Arts & Design, and the LeBow College of Business.

5. **Sustain dynamic connections with the College's corporate, governmental and community partners.** Drexel's pioneering emphasis on co-op, experiential education, and the strength of its alumni population within the Tri-State region give the College of Engineering an especially robust set of relationships with corporate and community partners in Philadelphia and well beyond. Drexel also has longstanding connections with government agencies, and has participated in multi-institution sponsored research on behalf of the Department of Defense, the Commonwealth of Pennsylvania and the National Security Agency. The next Dean will be expected to maintain a very visible and active profile in greater Philadelphia, to leverage Drexel's current connections, and to cultivate new ones that will advance the College's ability to address important needs in our society.

Desired Qualifications and Characteristics for Candidates

Drexel's next Dean of Engineering must be an innovative, visionary leader with a deep commitment to collaboration and the cultivation of excellence. The ideal candidate will possess:

- A distinguished record of scholarship and intellectual achievement;
- Strong leadership and administrative management skills;
- Strategic and long-range vision;
- A track record of collaborative program development, teamwork and partnership building;
- The willingness and ability to cultivate strong relationships with alumni and donors, and to raise financial resources for the College of Engineering;
- Outstanding communication and interpersonal skills;
- The ability to delegate, mentor, and develop leadership in others;
- A track record of promoting diversity and an inclusive, welcoming institutional culture;
- A commitment to growing the educational and research tradition of the College of Engineering and of Drexel University; and
- The ability to represent Drexel in local, national and global settings.

Additional Information

For more information, please visit Drexel's College of Engineering home page at www.drexel.edu/coe.

Compensation

Salary and benefits will be competitive.

Anticipated Start Date

July 2011

Applications and Nominations

For best consideration, please send all nominations, inquiries and expressions of interest in confidence and electronically no later than January 1, 2011 to:

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Drexel University is an equal opportunity/affirmative action employer, committed to cultural diversity and compliance with the Americans with Disabilities Act, and actively seeks applications from qualified women and minority candidates.