Preparing Students for Entrepreneurship

Increasingly, many engineering students plan to pursue entrepreneurial careers after graduation. The Preston M. Green Department of Electrical & Systems Engineering recognizes the need to prepare students for this exciting and rewarding career path.

Becoming a successful entrepreneur requires a broad array of skills. Some of the key skills students may need as an entrepreneur are: understanding market need, innovation, financing, product development, securing and defending intellectual property, management, sales, marketing, business networking, and risk management.

While no one program can prepare students for all of the business situations students may face during the course of their entrepreneurial career, the Preston M. Green Department of Electrical & Systems Engineering strives to provide a springboard for students who want to become successful entrepreneurs.

Students can gain essential experience from the following classes or activities in the department:

**Innovation, Technology Development, Prototyping:** Students can take a wide variety of course work in signals and systems (with applications in industry, medicine, defense, telecommunications, automobiles, and instrumentation), applied physics (with applications in semiconductors, nano-technology, microwave engineering, radio engineering, and biomedicine), and systems science and mathematics (with applications in optimization, control, automation, and operations research). Students may undertake undergraduate research (UGR, ESE 497) projects, either individually or as a team, and propose their own ideas for independent study (ESE 400) and senior design projects (ESE 498 and ESE 499). These projects help students develop a deeper understanding of specific technologies, to pursue the development of new ideas, and to prototype systems. Students may also take advantage of internships and co-op opportunities with start-up and established companies.

**Teamwork, Leadership:** Students have ample opportunities to participate in or initiate team projects. The department supports vibrant student organizations such as IEEE, SIAM, and EWB. Students assume leadership roles and initiate different projects. Examples of such projects include the modular dance floor, the little brother helicopter, the Tesla coil, and the plasma speaker. Through these projects, students learn to work with others, to manage projects, and in some cases to develop products to market.

**Networking:** The department sponsors many events during which students meet with successful entrepreneurs and learn their experiences first hand. The department boasts numerous alumni who have founded successful businesses here in the United States and around the world. Students meet with these successful alumni and develop personal relationships with them. Additionally, within the Washington University community, there are many opportunities to connect with other students who are interested in joining
an entrepreneurial venture. The Skandalaris Center for Entrepreneurial Studies, housed in Simon Hall, is a center for learning that supports campus-wide entrepreneurial activities among all majors and serves as a liaison between entrepreneurs of all disciplines. Additionally, it provides substantial connections to outside capital and mentoring resources, which can benefit aspiring student entrepreneurs. Student chapters of professional organizations such as IEEE, SIAM, and EWB, are also excellent avenues for networking. The department encourages students to participate in the study abroad programs as additional opportunities for networking in overseas countries.

Management, Marketing, Sales: Students can take classes such as Entrepreneurship (MGT 421), Introduction to Marketing (MKT 370), Principles of Financial Accounting (B50 2610), Individual in a Managerial Environment (B53 100), Business Planning for New Enterprises: The Hatchery (B53 424), and Community Development & Environmental Preservation through Entrepreneurial Collaboration (B63 550M). Students may also pursue double majors in the entrepreneurship program of the John M. Olin School of Business. Some of the projects students initiated have proven successful in the marketplace.

Risk and Failure Management: Many of the courses offered by the department require students to perform open-ended design tasks. Students learn to deal with technical and logistical challenges during the design processes, which include analyzing design tradeoffs and diagnosing and troubleshooting problems. Students may also take courses such as Legal Environment of Business (B53 421) to learn about the legal issues that entrepreneurs may face.

Useful links:

Innovation and Entrepreneurship at Washington University

The Office of Technology Management
(http://research.wustl.edu/Offices_Committees/OTM/Pages/OTM.aspx)

Center for Emerging Technologies (http://www.emergingtech.org)

Washington University Invention Disclosure Form
(http://research.wustl.edu/Offices_Committees/OTM/faculty/Pages/InventionsLicensing.aspx)

The Skandalaris Center for Entrepreneurial Studies
(http://sc.wustl.edu)

Young Entrepreneur video takes a look at what it takes to start a business in the current business climate. What skills are needed? What backgrounds do entrepreneurs have? How do students thinking about starting their own business get started and then take their talents to the next level.

(https://ieeetv.ieee.org/ieeetv-specials/today-s-young-engineers-become-tomorrow-s-entrepreneurs)