

Innovation, Product Design, and Entrepreneurship at the Swanson School of Engineering

The Innovation, Product Design, and Entrepreneurship Program features an interdisciplinary certificate that is open to all Swanson School undergraduates. This flexible program provides students with an opportunity to learn academic principles of design, creativity and entrepreneurship through hands-on experiences.

Why Innovation, Product Design and Entrepreneurship?

Employers seek engineers with skills in an array of emerging areas who can move products from conception to market in short time periods. It has become essential for engineers to *integrate marketing and business strategies with new products design skills*. In turn, technological and business changes in the product design environment have introduced manufacturing and production problems. Further, in addition to entering engineering professional practice, grad school or another field (e.g., medicine, business or law), an increasing number of graduates are becoming entrepreneurs either upon graduation or within a few years of graduation. Hence, it becomes imperative that students become prepared for this emerging career path.

The Curriculum

We have innovative, challenging, and exciting courses that cover:

- Design thinking,
- Additive manufacturing,
- Virtual and rapid prototyping techniques,
- Integrated electronic and physical systems
- Low and high resolution prototyping, and
- Business aspects of product creation

The Certificate

The Certificate is open to all Swanson School of Engineering undergraduates, as well as qualified undergraduates from other units. It combines coursework and co-curriculum experiences, with a broad, increasing menu of options. Courses will provide individuals with the necessary exposure and foundational theory that complements their major and enables them to branch into other areas of inquiry. Students must choose a set of five courses from three categories.

Area 1: Entrepreneurship (Select at least one course)

- ENGR 1060: Social Entrepreneurship – Engineering for Humanity (Fall)
- ENGR 1080: Lean Launch Pad (may be used for Area 1 or Area 3 but not both) (Spring)
- ENGR 1061: Intrapreneurship: Entrepreneurship within the Corporation (Spring)
- BUSENV 1790 Social Entrepreneurship (Spring)
- BUSSPP 1750: Commercializing New Technologies (Spring)
- BUSORG 1640 The Entrepreneurship Process
- ENGR 1062: Start-up Fundamentals for Engineers (Fall)
- The Innovation and Entrepreneurship Living Learning Center (participants need only 12 additional credits for the certificate)
- Acceptable international summer programs including INSA Lyon (France), Peking University's Globex (China), and Washington University of St. Louis (Israel)

Area 2: Innovation and Product Design (Select at least two courses)

- ENGR 716 H: The Art of Making (Freshman Honors Section (Spring)
- ENGR 1050: Product Realization (Fall, Spring; may be used for either Area two or three)
- ENGR 1716: The Art of Making: An Introduction to Hands-On System Design and Engineering (Fall)
- CEE 1609: Life Cycle Analysis Assessment Tools (Fall)
- CEE 1618 Design for the Environment (Fall)
- HRS 1706: Intro to Rehab Engineering Design
- IE 1052: Manufacturing Systems Analysis (Fall, Spring)
- IE 1089: Rapid Prototyping Additive Manufacturing (Summer)
- MEMS 0024: Introduction to Mechanical Engineering Design (Fall)
- MEMS 1049: Mechatronics (Spring)
- ECE 1160: Introduction to Embedded Systems Design (Fall)
- ECE 1161: Embedded Computer Systems Design
- ECE 1188: Cyber Physical Systems (Spring)
- ChE 314: Taking Products to Market – Next Step in Chemical Product Design (Fall)
- BIOENG 2150: Medical Product Ideation (Fall)
- MEMS 1032: Automotive Design and Fabrication (Fall, Spring, Summer)

Area Three: Capstone Design

- ENGR 1050: Product Realization (Fall, Spring; may be used for either Area two or three)
- ENGR 1080: Lean Launch Pad (may be used for Area 1 or Area 3 but not both) (Spring)
- ENGR 2811: Hacking for Defense (Spring)
- HRS 1718: Project Based Technology Design (Fall)
- ChE 414: Chemical Product Prototyping (Spring)
- BIOENG 2151: Medical Product Development (Fall)
- Blast Furnace hosted by the Innovation Institute (students participating in Blast Furnace need only 12 credits upon completion of the Blast Furnace requirements)

For More Information:

Dr. William (Buddy) Clark
218H Benedum Hall
412-624-9794
wclark@pitt.edu