DEPARTMENT OF BIOENGINEERING

Center for Medical Innovation

Professional Master of Science in Bioengineering
Medical Product Engineering

In conjunction with the University of Pittsburgh Center for Medical Innovation (CMI), the Department of Bioengineering offers a special Professional Master of Science (MSc) in Bioengineering with an emphasis on Medical Product Engineering.

The program focuses on the application of engineering methods to the identification of and solution to problems in health care delivery.

PROGRAM OBJECTIVES

The professional master's degree program in Medical Product Engineering provides a thorough grounding in the principles of medical device innovation and development compliant with regulatory requirements through a core sequence that starts with immersion in the medical/hospital environment and ends with a first generation prototype. The program emphasizes preparation for a career in the medical device industry through:

- hands-on, practical experience in medical product design and development.
- close interaction with physicians in clinical settings.
- instruction in professional practices in medical engineering.
- broadened Advanced Graduate Engineering Course electives in area of interest.
- strong curriculum in ethics, analysis, design principles, and principles of entrepreneurship as applied to medical device innovation.

EDUCATIONAL PROGRAM

The distinctive educational core of the program is four courses directed toward developing knowledge and skill sets important to the practicing engineer.

In addition to the Core Classes (12 credits), the Medical Product Engineering program requires an additional 18 credits (Medical Ethics - 3 credits, Graduate Engineering Mathematics or Statistics - 3 credits, Advanced Graduate Engineering - 12 credits) **for a total of 30 credits.**

ENROLLMENT

Enrollment in the program is by application and acceptance only. The overall form and content of the student's program of study is the responsibility of the Department of Bioengineering. Each student in the program will have a curricular advisor (CMI Educational Program Director) and a project advisor to guide the student's individualized educational experience. Students must maintain a minimum 3.0 GPA to remain in good standing in the program. Acceptance and enrollment in the program does not guarantee continuation on to the PhD program. Students interested in pursuing the Doctoral degree must complete the application process for the PhD program.

NOTE: Students accepted in the program must comply with all Swanson School of Engineering (SSoE) requirements for access to clinical sites within the UPMC system.

Students interested in the Medical Product Engineering track for the Professional MSc in Bioengineering should contact the CMI Educational Program Director for further information.

The Medical Product Engineering track requires a total of 30 credits (12 credits Medical Product Engineering Core Curriculum plus 18 credits of electives)

MEDICAL PRODUCT ENGINEERING

Track-Specific Courses

Medical Product Engineering Core Curriculum (12 credits)

Medical Product Innovation (6 credits)

BIOENG 2150: Medical Product Ideation (3 credits)

BIOENG 2151: Medical Product Development (3 credits)

Medical Product Prototyping (6 credits)

BIOENG 2170: Clinical Bioengineering (3 credits)

BIOENG 2171: Medical Product Prototyping (3 credits)

Electives (18 credits)

Graduate Engineering Mathematics or Statistics* (3 credits)

Advanced Graduate Engineering* (12 credits)

Medical Ethics* (3 credits)

Typical Schedule

First Semester

BIOENG 2150: Medical Product Ideation

Elective: Graduate Engineering Mathematics or Statistics Course*

Elective: Advanced Graduate Engineering Course*

Elective: Advanced Graduate Engineering Course*

Optional: Business/Law Course**

Second Semester

BIOENG 2151: Medical Product Development

BIOENG 2170: Clinical Bioengineering

Elective: Advanced Graduate Engineering Course*

Optional: Business/Law Course**

Third Semester

BIOENG 2171: Medical Product Prototyping

Elective: Medical Ethics Course*

Elective: Advanced Graduate Engineering Course*

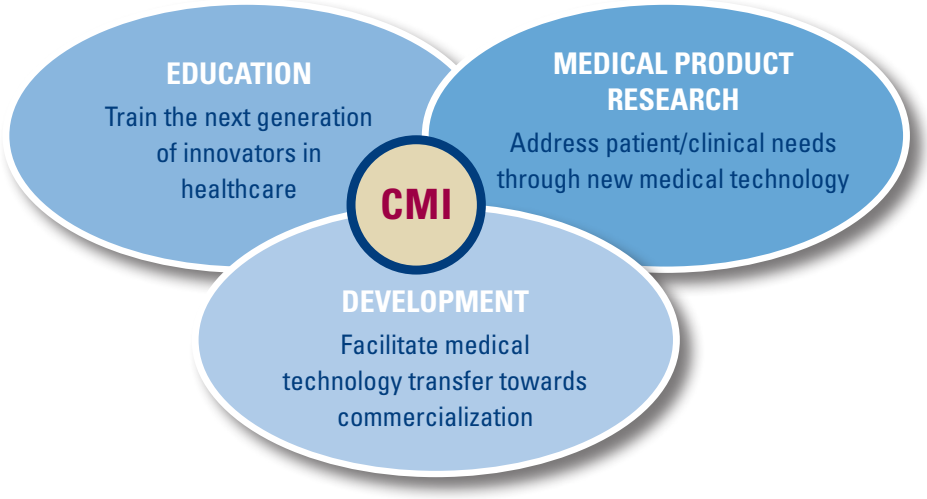
** Complete list of elective courses can be found at the CMI website (engineering.pitt.edu/cmi) and/or by contacting CMI Educational Program Director*

*** The Optional Business/Law Courses are directed toward gaining an appreciation for the special entrepreneurial and law challenges associated with the typical small businesses that are on the forefront of medical product engineering. The students enrolled in the Professional MSc program who opt to take the Optional Business/Law Courses (at least one Business course (3 credits) and one Law course (3 credits)) will also qualify to earn the Graduate Certificate in Medical Product Innovation as well as the Professional MSc in Bioengineering.*

UNIVERSITY OF PITTSBURGH
CENTER for MEDICAL INNOVATION
A University Center in the Swanson School of Engineering

Details of this program can be found at engineering.pitt.edu/cmi

CENTER FOR MEDICAL INNOVATION



A new interdisciplinary program within the University of Pittsburgh, whose purpose is to stimulate, guide, and promote the development and commercialization of technological innovations to improve health care. CMI provides an organizational structure that links faculty, students, and clinicians across the University of Pittsburgh through collaboration with the Swanson School of Engineering, Schools of the Health Sciences, the Katz School of Business, the School of Law, the Office of Technology Management, and the Wallace H. Coulter Foundation Translational Research Partnership II.

CMI MISSION

The mission of CMI has three essential components:

- **Research:** To provide an organizational structure to link engineering faculty, clinicians, and students at the University of Pittsburgh, and to fund early-stage development of innovative biomedical technologies.
- **Education:** To educate the next generation of innovators in the design, development, and commercialization of medical technologies through classroom and hands-on experiences in cooperation with the schools of Engineering, Health Sciences, Business, and Law.
- **Development:** To facilitate the translation of innovative biomedical technologies into marketable products, services, and business ventures in collaboration with the University of Pittsburgh Office of Technology Management and the Coulter Translational Research Partnership.

Educational Program

CMI will offer, through the Swanson School's Department of Bioengineering, two options for a Professional Master of Science degree (Medical Product Engineering track), and a new Graduate Certificate in Medical Product Innovation. Additionally, engineering graduate students may participate in courses and innovation projects as part of their dissertation work. Medical students will be able to satisfy School of Medicine research requirements through participation in CMI sponsored projects. Courses in innovation and entrepreneurship already offered through the Swanson School of Engineering, the Katz School of Business, and the School of Law will be available to all students interested in medical innovation. Multi-disciplinary student teams (including graduate students in engineering and business, as well as law and medicine) will work with engineering faculty, clinicians, and industry advisors to develop innovative medical technologies through the prototype stage.

"You can never solve a problem with the same kind of thinking that created the problem in the first place."

– Albert Einstein

The information printed in this document was accurate to the best of our knowledge at time of printing and is subject to change at any time at the University's sole discretion.

The University of Pittsburgh is an affirmative action, equal opportunity institution.

01/2014

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