Engineering Innovation in Medicine ME498

3 Credits
(technical elective counts towards ME option credit requirement)

Tuesday, Wednesday 4:00-5:20 pm
Instructors: Jonathan Posner, Kat Steele, Keith Chan, Per Reinhall

- Curious how medical technologies are developed?
- Want to apply what you study to health and medical problems?
- Want to make a difference improving quality of life through medicine?
- Feeling entrepreneurial?

This course is an introduction to the modern influence of engineering on medicine and health sciences. It is a project based class designed for senior level mechanical, bioengineering, and electrical engineering students (juniors require instructor’s permission) who are interested in pursuing a Capstone/senior design project on a medical related topic, working in biomedical fields, pursuing a healthcare degree, or understanding how engineers can contribute improving the quality of life through medicine and reducing risks & costs of health care. This course will include introductory lectures on medicine, how engineers contribute, need finding, design, regulation, insurance reimbursement, and intellectual property (i.e. patents). Examples of current technologies used in medicine and emerging challenges will be presented by medical practitioners. There will be several field trips to UW medicine to interact with medical technologies and observe medicine in practice. The course will also have lectures by successful biomedical entrepreneurs on their product evolution, challenges, and impact. Students will select pilot projects for the quarter and work in teams to assess its viability for further development in a full project. Completion of this course will provide eligibility for seniors to join interdisciplinary teams of students (ME, EE, BioE) in the Engineering Innovation in Medicine Capstone sequence that continues in winter and spring quarters.

Team based project assignments • no exams • contact J. Posner with questions: jposner@uw.edu

Invited Lectures:
- Fred Silverstein, MD, Clinical Prof. Medicine; Founder of UW GI Endoscopy Service
- Susan Stern, MD, Professor & Head Division of Emergency Medicine
- Doug Backous, MD, Medical Dir., Center for Hearing & Skull Base Surgery, Swedish
- Sam Browd, MD, PHD Associate Prof. Neurosurgery, Seattle Children’s
- Tueng Shen, MD, Associate Prof. of UW Ophthalmology, Director, Refractive Surgery
- Rob Golden, President and CEO, Lucent Medical Systems
- Paul Leonard, Principal, Leonard Consulting, LLC.
- Tom Satagaj, Esq, Partner at Seed IP
Mechanical Engineering Capstone Sequence  
Engineering Innovation in Medicine  
Fall 2014

This Capstone sequence focuses on interdisciplinary teams of engineering students working collaboratively to develop technical solutions to pressing medical challenges. Engineering students will earn credits in their home departments working together across engineering departments. The teams will be advised by faculty in Mechanical, Electrical, and Bioengineering as well as several mentors in the health sciences (e.g. emergency medicine, radiology, neurosurgery, etc.)

In mechanical engineering students interested in a Capstone project in Engineering Innovation in Medicine will earn credits in the following course sequence. Student enrolled in the autumn ME498 are encouraged, but not required, to continue in winter and spring quarters to complete a senior design project. Students not enrolled in the Autumn and Winter courses will be able to participate in the Spring 495 projects without permission in advance from the instructor.

**Autumn** 3 credits (course counts towards graduation as a technical elective)  
ME498 Engineering Innovation in Medicine (soon to be ME414).

An introductory, lecture based course focusing on medicine, how engineers contribute, need finding, historical examples of the application of engineering to medicine, design, regulation, insurance reimbursement, and intellectual property (i.e. patents). Several field trips to UW medicine to interact with medical technologies and observe medicine in practice. Students will work on quarter long pilot project evaluating potential topics for Capstone design. At the end of this course, medical challenges will be down selected and Capstone teams will be formed. No prerequisites.

**Winter** 1 credit (course counts towards graduation as a technical elective)  
ME498 Engineering Innovation in Medicine Design Preparation

Team based course on refining medical challenge needs, engineering specifications, benchmarking, and engineering design. Prerequisites ME498 Engineering Innovation in Medicine.

**Spring** 4 credits (required course)  
ME 495 Mechanical Engineering Design, Engineering Innovation in Medicine

Team based course focusing on design, build, test, and evaluation of a prototype medical technology/device. Prerequisites: ME395, ME498 Engineering Innovation in Medicine (autumn course), and ME498 Engineering Innovation in Medicine Design Preparation (winter)

Questions? Contact Jonathan Posner (jposner@uw.edu).