

BE 193**Clinical Bioengineering****FA20**

Class: MWF 8 – 11AM (but variable based on physician schedule)
Instructor: Dr. Adam J Engler
Email: aengler@ucsd.edu
Office and Hours: SCRM 2005, By appointment

Course Objectives

Undergraduate bioengineering students will be exposed to and develop a basic understanding of the clinical practices within UC San Diego's cardiology division within Department of Medicine (DOM) and Departments of Surgery (DOS), Radiology, Ophthalmology, Pediatrics, Emergency Medicine, Neurosurgery, and the Simulation Center of the School of Medicine and 3D Printing lab at Rady Children's Hospital. Students will act as *engineering consultants* during weekly group interactions with physician mentors where they will identify a problem in one of the physician mentor's clinical practices, propose engineering-based solution(s), and work towards a solution if possible.

Zoom Instruction

Due to the pandemic, observing rounds and shadowing in-person are not allowed. Instead, all interactions with physician mentors will occur weekly via Zoom in a preset schedule of physician interactions for all students; rotations in small teams matched to student interests is not possible. Due to the unpredictable nature of the practice of medicine, there will not be a set meeting time. However, all meeting times will be announced in advance per the syllabus on CANVAS and electronic recordings available to students. Hospital orientation was provided prior in the Spring quarter, thus students do not need additional forms.

Physician Mentorship

Students will meet with physician mentors on Zoom in weekly hour-long lectures. Prior to meetings, clinical videos will be posted on CANVAS for students to watch. Videos will include but are not limited to cases relevant to the physician's practice. **Mentor list, dates, and times will be posted shortly to CANVAS.**

Course Evaluation**1. TritonEd Discussion Board (25%)**

During the course of the quarter, students must at least make a weekly post on the course's TED discussion page. The subject of the posts can be related to the physician of the week, or can be a comment on another group's internship post, but posts must be made weekly in order to receive full credit (by Sunday at 5pm for the previous week). Failure to do so will result in the reduction of this portion of the grade by 2% for each week that it does not occur.

2. Mentor Grade/Participation (5%)

The physician mentor will determine a mentor grade based off of the participation, professionalism, and engagement of each student in their lecture.

1. Midterm Paper (30%)

Students will write a 3-4 page paper during the course of their first three physician meetings on a topic of their choosing but which must relate to a component of the discussion for that mentor. Topics can focus on the economics, social responsibility, current events, etc. involving healthcare and technology for a specific aspect of the cardiology division. Papers must cite scientific literature to justify the position taken.

4. Final Presentation (40%)

Students will be assigned to pairs and will give a 20-to-30-minute presentation describing their engineering-based solution to a problem identified during from the physician interactions. Presentations will be made during the final exam time slot. The presentation must include how their problem was identified, the proposed solution, and progress made towards the solution, if any.

Date	Lecturer	Date/Time	Specialty
Week 1 (10/5)	Orientation (10/6 @ 8am)		
Week 2 (10/12)	No Class		
Week 3 (10/19)	Dr. Jeff Gold	10/19 @ 8-10am	Pediatric Neurology
	Dr. Rebecca Rakow-Penner	10/21 @ 8-10am	MRI in Women's Health/Onco
	Dr. Albert Hsaio ¹	10/22-23 @ 2-4pm	Cardiac MRI
Week 4 (10/26)	Dr. Mohammad Eghtedari	10/28 @ 4pm	Breast MRI
	Dr. Albert Hsaio ¹	10/30 @ 2-4pm	Cardiac MRI
Week 5 (11/2)	Dr. Mohammad Eghtedari ¹	Reading Room (times vary)	Breast MRI
	Dr. Morgan Carlile	11/6 @ 8-10am	Emergency
Week 6 (11/9)	Dr. Christian Dameff	11/9 @ 10-11am	Emergency
	Dr. Justin Ryan ²		3D Printing/ RCHSD
	Dr. Ryan Reeves ²		Cardiology
Week 7 (11/16)	Dr. Chris Reid ²		Plastic Surgery
Week 8 (11/23)			
Week 9 (11/30)			
Week 10 (12/7)	No Class - Prep for final presentations		

¹Reading room sessions

²To be confirmed