Engineering World Health DeCal
Bioengineering 98/198, Spring 2013

I. Vital Statistics

Course Facilitators	Andrew Sabour, Sabrina Levy, Sasha Rassoli
Course Website	EWH homepage: ewhberkeley.weebly.com
Faculty Advisor	Professor Dorian Liepmann
Class Location	TBD
Class Times	Tuesday 6-7:30, supplemental design team meetings
Grading	Pass/No Pass (2 units)
Expected Work	Three to six hours per week at minimum
Contact for Details	ewh.berkeley@gmail.com

II. Course Overview

Engineering for World Health (EWH) at UC Berkeley is both a DeCal and club that focuses on improving world health through the design and engineering of affordable devices. The current disparity of economical medical technologies between the developed and developing worlds, at a large scale, restricts the latter from rising above well-known health crises. Numerous non-governmental organizations and the World Health Organization (WHO) attempt to bridge the gap through force of man power and coin to provide medical access and equipment to countries in need. Unfortunately, the field of affordable device manufacturing and innovation has been left relatively open. EWH at Cal will tap into student enthusiasm in an effort to be a part of the solution to this problem.

Engineering World Health (EWH) at UC Berkeley has three basic goals:
> 1. To design, build, and test medical-grade equipment that can be assembled at low cost without sacrificing key functionality
> 2. To develop and share a database of our do-it-yourself (DIY) designs so that people worldwide can use our designs free of cost
> 3. To continually study trends in public health concerns around the globe.

EWH has several active members currently in the process of designing DIY medical equipment; those who wish to do the same for academic credit should sign up for the DeCal. Being in the DeCal is not a prerequisite for being in EWH, and those who would like to participate without credit will be considered as members of the club.

III. Obligations and Methods of Assessment

Grades and in the EWH DeCal will be determined by the following factors:
1. Public Health Presentation
2. Computer Design
3. Project Participation
4. Attendance
5. Exam

Each section will be given a Pass or No Pass score based on the criteria for that subject. Each section must receive a Pass for the student to receive a Pass in the class.

A. Public Health Presentation

As members of Engineering World Health, it is critical to gain a general understanding on the public health issues the international community currently faces.

To satisfy this, all members are required to make one **10 minute health presentation** regarding a designated public health topic and health history behind an assigned developing country. Each class will therefore come out to have 1-2 public health presentations every week at the end, with officers pitching in as well.

Topics will be given out on a first come, first serve basis. Sign-ups for public health topics and presentation dates will be given out after the first general meeting. Presentations must be emailed to the club the Sunday of the presenting week.

Presentations will typically vary between 8-15 slides, covering an introduction of the health topic, afflicted geographical locations, symptoms and statistics, interesting facts, current advancements in improvements, and a works cited. Sample presentations are readily available online at ewhberkeley.weebly.com.

B. Project Participation

Members and students in EWH will be categorized into either
1. Decal Projects (DP)
2. Project Groups (PG)   **[Returning members only]**

Decal projects (CSPs) are worked on collaboratively by the entire decal, and team positions are given priority to DeCal students. These will revolve around projects given by NGOs, public health associations, and experienced project groups. DPs will be advised by officers and worked on collectively by members during the meeting. Assignments will be given to be completed for the following week. Such projects are created for the purpose of having new members collaborate together on an independent project in an effort to give them the full experience of tackling a world health problem.

> Members in DPs may be asked by officers to give a 10 minute update presentation from time to time to inform the entire club of where the project is heading. These are rare and will be determined by the officers.

Project groups (PGs) are lead by project group leaders, veteran members who have remained active in the club for at least 1 semester. Many already have experienced members and will accept at most one or two more members to train and incorporate into the project.

Currently, EWH has seven ongoing PGs:
     i.   Tissue Culture Hood
    ii.   Micro-Centrifuge
    iii.   Public Health Papers (hiatus, looking for new leader)
    iv.   Micro-pipetter
    v.   ECG/EKG Device

C. Computer Design

Engineering and the designing of economical and innovative devices is the primary tool our organization uses to better world health. In order to successfully design devices, measurements and calibrations need to be drawn and tested on the computer, creating a blueprint of a device prototype before actual construction begins. In order to help members in their endeavors, EWH takes it upon itself to teach its members programs that have proven critical to many scientists and engineers across the world for device design.

AutoCAD – This semester AutoCAD will be emphasized and instructed to members of the club in the first half. Different functions, capabilities, and general know-how around the program will be taught to give members the essentials in drawing their design for the second half of the semester.

There will be a computer design lesson every weekly meeting for the first half of the semester. Examples will be given to the class and worked along with throughout the lecture.

D. Attendance

Attendance to weekly meetings is crucial. Absence to meetings will result in the inability to hear the public health/DP presentation, computer design lesson, and interacting with PG or DPs.

Attendance will be taken 5 minutes after Berkeley time to encourage members to make an effort to attend without interfering with presentations. This is also when general announcements occur.

A maximum of **3 unexcused absences** are allowed. Attendance to the second general meeting is required.

Attendance to PG or DP meetings is based on the opinion of the PG leader or officers.

E. Exam

A 30 question multiple choice final will be given in the last meeting of the semester. The exam questions will be based primarily off of the public health presentations and a few conceptual computer design questions.

The final exam is considered to be relatively straightforward, and a **minimum of 50%** is needed to be considered a pass.

IV. <u>Useful Resources</u>

No prior knowledge or skill is needed to join the organization. This organization is not limited to engineers!

For information on successful engineering and product development, as well as the steps it takes to go from an idea to production, we recommend the following very helpful book:
Ulrich, K. T., and Eppinger, S. D. *Product Design and Development (4th edition)*. New York: McGraw-Hill/Irwin, 2008.

Collaboration, not just with other student teams but also with organizations outside of EWH, is critical to successful design. As a result, students are highly encouraged to seek out opportunities for collaborative work with humanitarian organizations, academic institutions, and professionals