



Pioneers in Engineering (PiE) Robotics Mentorship DeCal Spring 2019 (EE198, 2 units)

Sections: Tuesday or Friday (Option of 2 section times)

Time: 6:30-8:30 pm

Location: 10C Jacobs Hall

DeCal Email: rcdecad@pioneers.berkeley.edu

Facilitators/Email

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Course Description

Pioneers in Engineering (PiE) promotes science, technology, engineering, and mathematics (STEM) education through an exciting, mentorship-based process. PiE is a student outreach organization based in UC Berkeley and was founded in 2008 by members of Tau Beta Pi. We strongly believe that no student should be denied a quality STEM education experience.

Two or three college students are assigned to mentor each high school team, guiding them through the engineering process of building a competition robot. This course is designed to provide mentors with the hands-on training, technical skills, and mentoring experience they will need to guide their team through the competition season. Classes will mainly consist of hands-on activities and group discussions, with some short presentations mixed in as well. Office hours can be scheduled with facilitators for additional assistance.

Sections are two hours per week, plus two hours of mentoring per week, and 4 required season events throughout the semester. There will also be about 30 minutes of homework every week.

Course Materials

All course materials and announcements will be assigned and posted on bCourses. This will be our main mode of communication. When it is needed, students will be notified to bring in their laptops (or let us know if they don't have one, as we can provide some).

Course Prerequisites

There are no prerequisites. Students of all majors, backgrounds, and experiences are welcome to take our course.

Learning Objectives

As a result of the course, you will have a basic understanding of robotics as well as mentoring skills and confidence to work with high school students. We will be developing competency in these areas:

Safety: shop safety, usage of hand and power tools

Mentorship: creating and following a schedule, managing a team, communication and collaboration skills

Engineering Design: practice with the iterative engineering design process

Game Analysis: robust understanding of game rules, experience analyzing games and game strategy

Mechanical: familiarity with assembly of kit parts, material selection

Electrical: familiarity with control system and wiring

Programming: familiarity with Python, with reading an API, and with programming fundamentals such as variables, functions and inputs/outputs

Although we do expect mentors to learn this technical information as the semester continues, we would like to emphasize

that we are promoting a learning environment. We understand that mentors may not be able to master engineering and programming skills within a semester, and are not expectant of this. Rather, your task as a mentor is to be a role model for your students; we would like you to focus on supporting your students rather than memorizing technical details. Also, numbers permitting (and based upon past DeCal history), you will be paired with at least one other mentor, especially if you are new. We hope that these mentor pairings provide additional support, in addition to the resources provided.

Grading

Students will be graded based on attendance, homework and participation in mentoring activities.

To pass the course, abide by the mentoring policy outlined below, abide by the section attendance policy, and not miss more than 1 event.

As DeCal mentors, students must keep in mind that they are UC Berkeley volunteers, meaning that they must abide by the volunteer's code of conduct. The code of conduct can be found [here](#). Decal mentors who are disrespectful to their high school team or break any part of the code of conduct are at high risk of failing the course. High school teams, which consists of students and teachers, will also be providing us feedback regarding your performance as a mentor.

As facilitators, we will do our best to provide any assistance to mentors if there are any issues throughout the semester.

Events: 30%

Mentoring: 30%

Attendance: 20%

Homework: 20%

Please keep in mind that the percentages above are quantitative weights of your grade. We also do have qualitative assessments, which will especially be taken into consideration if you are on the border of not passing.

Section Attendance

Because of the limited time to prepare for competition season, students must attend the beginning core lessons (these are noted by an asterisk in the schedule on the next page. Mentors must be familiar with technical information that is provided in these lessons in order to help your teams effectively). If you miss a core lesson, you must talk to facilitators to address the lessons' material.

No more than 2 section absences will be allowed in total, and you can only miss **one core lecture**. You must set up a time with facilitators for office hours the following week to ensure that you understand the material from this lecture; no exceptions.

Please contact the facilitators to excuse yourself from class 24 hours in advance, or email rcdecal@. Excuses will be evaluated on a case-by-case basis. Additionally, a makeup class/office hours may need to be scheduled with the facilitators.

Julie (and other facilitators when needed) will be hosting office hours. These will be starting February 11th. Let us know if you're coming by emailing rcdecal@pioneers.berkeley.edu the morning of.

While we'd like you to commit to the same section time every week, you can email us if you need to come in the other section for a particular week.

Homework

Mentor Journals: There will be two due throughout the season, and they will be on your team's progress. We expect them to take about 30 minutes to complete. Any homework that is turned in 24 hours late will receive partial credit. Any homework turned in after that will not receive credit. Homework will be graded on completion, and if you have any issues with the deadline, please email us! We are here for you.

There will also be three surveys - the introduction survey, mentor matching survey, and the final feedback survey. If you do not turn in the **final feedback survey**, you will **not** be able to pass the class. This feedback is very important to us!

Educational narrative: This is a short writing assignment through which you will reflect on your own academic journey. This will be a required assignment and can be turned in 24 hours late for partial credit.

There may be additional homework on some weeks, as indicated below in the syllabus (i.e. for the programming assignment). Any recommended/fun readings will also be posted to bCourses, although we will most likely not post any readings. Assignments will be turned in electronically via bCourses **unless specified** to bring a hard copy.

There are no required readings for this course.

Mentoring

Student mentors will be personally matched with other mentors and high school teams based on several criteria, including schedule availability and best fit.

Students **must** attend all of the following events: Kickoff, Game Day, Scrimmage, and Final Competition (absences will be adjudicated on a case by case basis); they must also mentor their team for at least two hours per week during the competition season to pass the course. Note that Final Competition is two days. There is also another season event called Design Review, but since it's during the end of Spring Break, it's not a required event for mentors.

At least one mentor has to be with the team for each of these events. Attendance to an event is defined as **being present at the event for more ⅔ of its duration**. For example, for a 3 hour event you must be there for 2 or more hours.

Kickoff attendance is absolutely mandatory because it is the first day you will meet your students.

Notify your team (and make sure to CC rcdecad@pioneers.berkeley.edu) at least 48 hours in advance if you need to miss a meeting with your team. Mentoring is a time commitment that we expect you to take seriously. That said, we are very flexible about days and times when you are available to meet with your team. You will be responsible for setting up a weekly schedule to meet up with your team. Please reach out to the facilitators ASAP if you have difficulty in contacting your school.

You are **not expected** to mentor during Spring Break. However, for mentors at schools that have break after ours, please try to figure out a way where you aren't out of contact with them for two consecutive weeks. Google Hangouts/remote mentoring is acceptable (especially for this situation).

Sec#	Week	Topic	Reminders	Due Date: Assignment
1	02-04	Course Overview + Introductions LEGO Mindstorms Activity		
2	02-11	Kit Introduction, Building the Robot		2/9: Intro survey
3 *	02-18	This is Dawn Kit extension Overview		
4 *	02-25	Tool Training/Safety Common troubleshooting issues (brief)	03-02: Kickoff	
5 *	03-04	Kickoff Debrief Intro to Game Analysis + Strategy Game Day Expectations	03-09: Game Day	Recommended reading for the following week: Game Manual (TBA) Game Video
6 *	03-11	Game Day Debrief Mechanical Lesson This is Dawn Pt. 2		3/15: Mentor Journal 1 (2 prompts, instead of the usual one)
7 *	03-18	Common Troubleshooting Issues (Diving In) What makes a good mentor? Design Review Expectations	03-23: Design Reviews	(it's possible another short "teaching cs" assignment will be released)
8	04-01	Mentor build time Exhibition expectations	04-06: Exhibition	3/25: Mentor Journal 2
9	04-08	No section One-on-one check-ins outside of section		
10	04-15	Scrimmage expectations		
11	04-22	Common issues with team management?	04-20: Scrimmage	
12	04-29	Menchie's social Mentor discussion		
13	05-06		05-04: Final Comp	5/4: Exit Survey + Reflection

Statement of Accommodation

Please email rcdecad@pioneers.berkeley.edu or talk to any of the facilitators if you need any DSP accommodations.

Emergencies

We will follow the standard building procedures for emergencies.

Course Evaluation

We will have three evaluation forms - one for rolling feedback, one mid-semester evaluation form, and one end of the semester evaluation form. Again, you must fill these out in order to pass the class.

Disclaimer: Things may shift around in the syllabus.