

Project Brief

ME 170A/B Mechanical Engineering Design – Integrating Context with Engineering

Title

3-5 words

Project Provider(s)

Sentence or 2 describing who the provider is and what the provider does

Project Goal

2-3 sentences describing the goal of the project

Project Inspiration and Motivation

1-2 paragraphs describing the motivation behind the project, and why it is important. This should provide background, impact, and then narrow down from the big picture to the project goal.

The Problem

Who is/are the user(s) and what is the problem from the perspective of the user?

1-3 paragraphs providing background on the user, including is this a small community, how many users are, or could be, facing this problem. If there are multiple types of users, please provide that as well.

1-2 paragraphs as necessary to describe the user, and what s/he see as the problem. This can then define the problem statement with more clarity

What does the user need?

1-3 paragraphs describing the user needs in the context of this project. This should include the use case that defines the user need(s). If the specific engineering requirements / constraints are known, include those as well.

What has been done to date to try to address this need?

Describe what has been done to try to address this problem. Clarify why this problem doesn't have a pre-existing solution, or what issues may exist with existing solutions that this project should address

Project Liaison

Provide point of contact: name, email, phone

References

Include as needed

Some guidance on the project definition, to the provider

- 1) Projects should include
 - a. Emphasis on Clean Energy, Transportation, Sustainability and/or Health
 - b. Structural, material, thermal, dynamics, controls/electromechanical, and/or fabrication considerations
 - c. A problem that the provider is interested in exploring, but is not on any critical path or an expected part of any type of partner deliverable. Students are not doing the work “for hire”
- 2) Projects should be scoped so that students can
 - a. Assess and scope the problem they are to work on
 - b. Translate user needs to technical design criteria
 - c. Conduct engineering analysis
 - d. Assess and scope design directions, resulting in 3 most promising
 - e. Narrow to single recommended design direction
 - f. Conduct design risk analyses, computational modeling
 - g. Be of size/scale that students can make, build and test on campus
 - h. Reasonably deliver a working solution in 10 weeks, and a vetted engineering solution in 20 weeks
- 3) What the provider should be prepared to provide
 - a. Project must have a project “liaison” with whom the students can work
 - b. The liaison must be able to either represent the user themselves, or put the team into contact with the user. These contacts need to be established with phone/email prior to the start of class.
 - c. Liaison should plan on attending the second day of class to present the project to the students. This will be the basis of the students selecting which project they want to work on. Then the liaison should plan on attending the third day of class to meet the students who will work on their project(s).
 - d. Liaison must be available for meetings / calls / zoom. Preferably local but not required. These should be once every 1-3 weeks.
 - e. Be available to physically attend end-of-quarter presentations, in both Autumn and Winter quarters
 - f. If dedicated/unique hardware or test facility is required, please provide
- 4) Expectations
 - a. Projects are done by students as a learning experience, and contracts for course projects are not allowed
 - b. At the beginning of the term, the projects will be presented to students and they will nominate the projects on which they want to work. There is therefore a possibility that not all projects get selected.
 - c. This is a 4-unit course, meaning that students are each expected to spend ~12 hours/week on the class, so this is not a full-time role for them. Students will be placed into teams of 3-4 for each project
 - d. In accordance with university policy, students must be able to openly present their work to classmates, instructors, guests, etc
- 5) Please contact Jeff Wood at jwood11@stanford.edu with any questions, and to submit your project proposals.