

## BME 402 Preliminary Design Presentations

For this final design course, you have moved beyond the stage of considering three or more design concepts and using a design matrix to select the best approach. Instead, the objective here is to show that you are moving along the path described here. The focus of the spring semester, and of your presentations and reports, will be on how your team has moved forward from the prototype you developed by the end of the fall semester to a final device that closely meets your client's needs.

Format your presentation as you would to a Board of Directors (seeking approval to move forward) or to a potential investor or funding entity (e.g. CrowdSource). In other words, assume an interested and intelligent audience, but not necessarily one that will understand the technical details without a clear but concise explanation. Do not read non-essential facts during your presentation, such as dates on your timeline, but rather explain items that are the most important to your client. (Design, Test Results, Cost). The focus should be on demonstrating that the device, as designed, works (or will work) as intended.

Preliminary Presentation Outline:

- Brief problem statement, Client description, and a few of your most important design constraints
- Why should we care about this project (i.e. what is the broader impact of this device/process?, important competing designs?)
- Summary of last semester:
  - Final design/Prototype
  - Evaluation/Testing Results (include lessons learned)
- Specific Goals with timeline. Discuss the goals for this semester's final prototype, how this will come closer to meeting your client's needs, and when you plan to work on/complete each goal.
  - Fabrication - What design improvements will be needed to meet these goals?
  - Evaluation/Testing – Address the following: What tests being run, why these, what data will be generated, how will it be analyzed, and how will the expected results demonstrate that the prototype meets the PDS and client's requirements?
- Other information specific to your final prototype (brief summary)
  - Packaging
  - Documentation (user manual, maintenance instructions, service instructions, safety cautions or warnings, etc.)
  - Other
- Budget (Be specific, past and future expenditures)

A copy of the evaluation sheet for your presentation is on the website.

## Deliverables for BME 402, Senior BME Design

In the final semester of your BME Design course, your team will be responsible for conducting all of the following in fulfillment of the department's requirements:

### 1. Research & Development (Document everything in design notebook):

- a) Redesign & modify the engineering prototype as necessary.
- b) Create technical documentation (drawings, flow diagrams, source code) of all changes made, and an explanation of why they were necessary (i.e., insights gained from construction, testing, or other feedback from the Fall semester).

### 2. Testing:

The performance of a new prototype must be experimentally validated to determine if it conforms with the specifications stated in the PDS. Your experimental design should address the purpose of your tests, the methods to be used to conduct them (including details on the specific measurements to be made, the number of trials, etc.), why these particular tests are important/relevant to your inquiry, the expected results, and how this data will provide evidence to demonstrate that the device/process performs as intended (meets requirements of the PDS). If your testing involves human or animal subjects, you will need to have submitted either an animal research protocol or a human subjects research protocol to the appropriate review board, and to document that your testing was in accordance with an approved protocol (also document everything in design notebook).

### 3. Reporting:

- a) Deliver an oral presentation about the timeline and plans for testing and refinement.
- b) Preliminary Design Report: Complete a draft manuscript for submission to a peer-reviewed journal that is relevant and appropriate to the area of work for your project. Your manuscript must be formatted to be consistent with the standards for your chosen journal. Follow the author's guidelines for submission for your journal of choice. Submit as complete a draft as possible (i.e., name of journal, title and authors, introduction, background, and materials/methods) leaving a detailed outline in areas that are not yet completed.
- c) K-12 Outreach
  - a. Submit an Outreach Summary Report of your presentation.
  - b. Have the classroom teacher/leader of audience complete and submit an evaluation of your presentation.
  - c. Submit all materials used (such as slide sets, activity description) during your presentation and activity.
- d) Submit an Invention Disclosure Report (IDR) to WARF. [Note: The IDR may not be necessary/permissible in all cases. See your advisor for specific instructions].
- e) Executive Summary
- f) Final Report: Complete a manuscript for submission to a peer-reviewed journal that is relevant and appropriate to the area of work for your project. Your manuscript must be formatted to be consistent with the standards for your chosen journal, although actual submission of the manuscript is optional. Attach as an appendix information that was not included in the manuscript from your BME 400 semester (i.e. the design process with revisions), experimental design, failed experiments, etc. The BME 402 report should be a complete story of your project.
- g) Deliver a poster presentation to the public and turn in notebook at the end of the semester.