Interdisciplinary Capstone Design
Concept Design Review

Assignment Goal

To present a formal "progress update" for your design project, making recommendations for the path forward and achieving agreement on the design concept to be pursued for the project.

Learning Outcomes

As a result of completing this assignment, you should be able to:

- <u>Articulate</u> the objective, value proposition, problem definition, and product requirements for the project
- Professionally <u>present</u> multiple design concepts under considerations and engineering analysis conducted to evaluate each concept for viability.
- <u>Recommend</u> one concept for the design which will be the focus of the remainder of the project.

Relevant ABET Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Approach and Rationale

Design Reviews are some of the most important milestones in an engineering project. It is an opportunity to gain important insight into the challenge that has been undertaken, but also an opportunity to acquire valuable new ideas from the audience. As a result, it should be viewed as an opportunity to learn and grow through the experience. However, you also need to do your homework ahead of time and come to the review with recommendations and engineering analysis to support these recommendations.

Task

Working in your capstone design team, you are assigned to <u>organize</u> and <u>perform</u> an orally delivered presentation summarizing your progress and recommended path for success completion.

The suggested approach for **organizing** your presentation is:

1) <u>Construct</u> a set of MS PowerPoint slides to anchor your presentations (*Be sure to put the slide number on each slide)*
2) <u>Structure</u> your slide-show presentation to cover the following topics:
   a. The single <u>objective</u> of your project.
   b. The <u>value proposition</u> for your project (including articulation of the real-world problem you are working to help solve).
   c. The <u>background</u> and customer/product <u>requirements</u> for your project.
   d. An overview of the <u>conceptual development</u> process and evaluation of concepts.
   e. <u>Recommendations</u> and justification for which concept will be the most successful path moving forward.
   f. <u>Identification</u> of potential risks with the project and how you will mitigate them.

     g. A summary of the <u>validation</u> approach you intent to use to confirm the prototype meets the requirements.

     h. The overall project <u>schedule</u> and <u>budget</u> and how your project plan fits within these constraints.

3) In additional to slides, consider presenting any of the following to support your presentation:
   a. A <u>physical representation</u> or demonstration of an early rapid prototype
   b. Physical evidence, data, or examples supporting your recommendations

The suggested approach for **performing** your presentation is:

1) <u>Choose</u> team members which are competent and well-versed in the project for speaking roles.
   a. It is **not** a requirement for every team member to speak
   b. Choose team members to represent their respective disciplines or expertise for different aspects of the project.
2) <u>Plan</u> to deliver your presentation is **~20 minutes**, allowing time for audience questions and discussion. *Note: This time frame typically corresponds to ~15-30 slides.*
3) <u>Speak</u> at a moderate pace and use language which is easily understandable for a wide range of audience members. Be aware of the audience and adjust to their non-verbal feedback throughout.
   a. Talk in a conversational voice and tell the "story" of your project
   b. Avoid the temptation to read your slides to the audience.
4) <u>Ensure</u> that you are speaking synchronously with your slides and other visual aids.
   a. A good strategy is to make your slides highly visual with pictures, graphs, tables, etc. and use your commentary to enhance the message.
   b. Make sure that each slide "stands alone" and provides a simple message or *key takeaway*.
5) <u>Dress</u> and <u>conduct yourself</u> in a professional manner.

<u>Logistical preparation</u>:

A. Scheduling
   a. **At least one week ahead** - verify that customer, instructor, and mentors can attend and have a specific time reserved on their calendars.
   b. **One week ahead** – secure room location and/or make travel arrangements.
   c. **Three days ahead** – have instructor and/or mentors review your slides.
   d. **Three days ahead** – email reminder to all participants.
   e. **One day ahead** – email presentation or website URL to any audience members who will be connected by phone.
   f. <u>Arrive</u> in the room for your presentation at least 10 minutes in advance of your talk.
B. Attendees
   a. Your audience will typically be comprised of:
      i. The Project client/sponsor
      ii. Capstone faculty
      iii. Other interested faculty
      iv. Graduate student mentor
      v. Fellow capstone students
      vi. Shop Manager
   b. **Every capstone student should attend at least two separate design reviews.**

Assessment

The Concept Design Review will be assessed by attendees who will each fill out a scoresheet. Attendees will evaluate and score the presentation for each of the following criteria on a scale of 1 – 5. The characteristics of an excellent technical presentation (score of 5) are provided in parentheses: Organization, Delivery, Completeness/Accuracy, Visual Aids, Audience Interaction, Concept/Design Quality, and Project Management.