Project Deliverable D: **Detailed Design, Prototype 1, and BOM**

GNG 2101 – Intro. to Product Dev. and Mgmt. for Engineers

Faculty of Engineering – University of Ottawa

Objective:

Provide design details for your concept and build a prototype to test the product's most critical functionality and target specifications. Use the prototype to interact with your client and obtain valuable feedback. Provide a bill of materials and parts (BOM) for you final prototype.

Instructions:

As a group:

1. Summarize the client feedback that you received during your second meeting for your conceptual design and clearly state what needs to be changed or improved in your design.
2. Develop an updated and detailed design of your concept, based on your client meeting, which includes:
    a. *For physical prototypes:* Visual representations of the overall concept, as well as each subsystem. Clearly define how each subsystem is linked to other subsystems (including fasteners and electrical wires).
    b. *For software prototypes:* User interface and flow chart diagrams of the overall concept, as well as each subfunction. Clearly define how each subfunction is linked to other subfunctions.
3. Define your most critical product assumptions.
4. Create your first product prototype that will be used to test those assumptions.
   Important reminder: The objective of your prototype is to validate the assumptions you have made about the product and your prototype must be used test these assumptions.
5. Document your prototype using as many sketches/diagrams/pictures as required and explain the purpose and function of your prototype.
6. Carry out prototype testing, analyze and evaluate performance compared to the target specifications developed in Project Deliverable B and document all your testing results. Present your testing in an organized, tabular format that shows expected versus actual results.
   Important reminder: Every prototype you create must have a purpose and must be tested. What product assumption is each prototype trying to verify?
7. Outline what your team intends to present to your client(s) and what information you would like to gather at your next client meeting.
8. Provide a detailed preliminary bill of materials and parts (BOM) for your final prototype, which will be presented to your project managers for approval and purchase. Include web links for each product in your BOM. You will be given up to **$100** for the

development of your **final prototype only**. Before making any purchases, you must review the following guide: https://en.wiki.makerepo.com/wiki/Purchasing_Guide.

Since this is your first product prototype, you can either create a global proof of concept or a more focused prototype for one or more critical subsystems, in order to ensure that your design will work well. You will not receive a budget for this prototype, therefore it should be made using materials and components that *cost very little* (e.g. things found around the house, Makerspace or Brunsfield, scrap or other recycled material, etc.). Get *creative* in order to improve your results, but make sure that you confirm that the 'scrap' material is available for use.

Exception: if you intend on using a specific component in your final prototype and are confident that it will be required (e.g. Arduino), then it can be approved and purchased through your project manager at this time.

Tips and tricks for designing and fabricating your prototypes are provided here: https://en.wiki.makerepo.com/wiki/Design_for_manufacturing.

Project Plan Update:

1. Update your project plan to include any missing tasks, task responsibilities, milestones, or dependencies, based on feedback you have received from your PM/TA and your better understanding of the project.
2. Include more detailed sub-tasks for the tasks that will need to be completed over the next two weeks. Important note: It should be possible for ONE person to complete each identified task or sub-task in the allotted time. The allotted time should also be reasonable, based on the task owner's availability.
3. Verify and update task start dates and end dates for each task, based on project progress.
4. Ensure you have taken into account each team member's actual availability over the next two weeks, as well as events such as particularly high course loads, exams or travel, which may limit actual project work progress.
5. Include an updated version of your project plan as part of this submission.

Self-assessment:

Before submitting this deliverable to Brightspace, as a group, you must evaluate your own performance by using the rubric found in the Brightspace folder for this deliverable and by completing the following Google form:

https://docs.google.com/forms/d/e/1FAIpQLSfIdkpnRgDBIhUxEMLUEW6ZPB1Ny5peSINnJTtFs0725HIeYA/viewform?usp=sf_link

The self-assessment is intended to help students develop skills for evaluating their own work according to the specified criteria any time they produce or deliver a work.

Submission:

Each team (***only one person from each team***) must submit a PDF copy of this deliverable by uploading the file as an attachment into Brightspace.

Due Date:

See Brightspace.