1.3.7 Design a Protective Case Design Brief

Client	Earbud manufacturer
Target Consumer	Earbud customer
Designer(s)	Ryan Curley, Jeremiah Brown
Problem Statement	**What is the problem?** A manufacturer of high-end earbuds (or other small consumer product) has received complaints from customers that the wiring for model E123 is susceptible to pulling free from each earpiece when carried in pockets and bags. In addition to strengthening the wire connections, the manufacturer would like to supply a protective case for the earbuds that will further protect the device from damage. **Who has the problem?** Earbud (or other device) customers. **Where is the problem happening?** All markets across the world report similar issues with wiring pulling free of the earpieces. **Why is the problem important?** The company has experienced significant loss in ear bud market share corresponding to the increase in ear bud complaints.
Design Statement	We will design and build a earbud case that is able to not only safely store the manufacturers intended earbuds, but also design a case that can firmly lock into position and stay closed while being carried within the buyers pocket.
Criteria	1. The case must be composed of two components connected by a hinge mechanism. 2. The design must allow easy insertion of the ear buds into the case such that it requires an average user 7 seconds or less to secure the ear buds in the case. 3. The case must securely store and protect the earbuds from damage and not break or open when carried in a pants pocket or loosely in a purse or bag. 4. The design will include vent holes to allow air circulation into the case but not allow any part of the earbud(s) to protrude through the hole(s). 5. *(Add measurable criteria to more effectively specify a successful solution.)*

Constraints	1. [Time] A design must be submitted for critical review by the due date. 2. (Optional) A 3D-printed prototype must be submitted no later than 5 days past the original due date.... (due to printer limitations/run time) 3. Due to limitations in production, ● The maximum volume of prototyping material is 5 cubic inches. ● The maximum print time is 8 hours.
Deliverables	Phase I – Proof of Concept Only ❑ Initial conceptual sketches – at least 3 per team member ❑ A multiview drawing detailing each component of the preliminary design (Be sure to include all general dimensions, centerlines, hidden lines, notes, etc…) ❑ A physical prototype or mock up of the design (3D-printed or other suitable alternative) ❑ Documentation of total material volume and print time for each physical and/or 3D printed parts (Materials + Time = Costs…?) ❑ Proof of Concept Statement ❑ Project Reflection

Project Grading Criteria:

Project (100 pts):

		Yes	Kind of…	No
1.	Are ***all*** established project criteria met?	20	10	0
2.	Are ***all*** established project constraints met?	20	10	0
3.	Are ***all*** deliverables submitted by the deadline?	20	10	0
4.	Is the product design appropriate? – Will the target client(s), consumer(s), and/or user(s) approve? *(Is it creative/original…?)*	20	10	0
5.	Is the presentation/project completed with the utmost attention paid to overall organization, understanding and professionalism/craftsmanship?	20	10	0

Total =____/100%

Final Score = Advanced, Proficient, Average, Needs Improvement, or Incomplete??? Why?

Justify your teams final score here:

-

Presentation (100 pts):

		Advanced	Proficient	Average	Basic	Incomplete
1.	Define the Problem a. Completed Design Brief with added criteria	10	9	8	6.5	0
2.	Generate Concepts a. Concept sketches (three minimum) b. Justification for solution path	10	9	8	6.5	0
3.	Develop Solution a. 3D solid models of two components (with partner) b. Multiview drawing for each component	10	9	8	6.5	0
4.	Construct and Test a. 3D printed or alternate physical prototype b. Proof that prototype works...	10	9	8	6.5	0
5.	Evaluate Solution a. Proof of concept statement	10	9	8	6.5	0
6.	Completed Team Project Reflection Questions & Graded Project Rubric w/ Justification	10	9	8	6.5	0

Total =____/100%

Final Score = Advanced, Proficient, Average, Needs Improvement, or Incomplete??? Why?

Justify your teams final score here:

-

Project Team Reflection:

As a team, reflect and answer the following prompts:

1. *Describe each model you produced to represent your design during the design process. For each model include the following:*
    i. *Type of model*
    ii. *Purpose of the model*
    iii. *Limitations of the model*
    iv. *Justification for using this model in this circumstance*
    -

2. *Review the goals you recorded at the beginning of the project. Did you achieve your goals? Why or why not?*
    -

3. *What previous experience(s) (in this class or elsewhere) helped you solve this problem? Explain how your previous learning connected to your learning during this project.*
    -