

DESIGN TEAM PERFORMANCE ASSESSMENT

Component 2 of the TIDEE Design Team Readiness Assessment

ASSESSMENT INSTRUMENT

- Purpose:** Formative assessment of students' abilities to **perform** processes crucial to engineering design, typically, for pre-capstone design.
- Instrument Type:** A team design exercise to demonstrate students' abilities to apply the engineering design process, teamwork, and design communication to an open-ended "design" problem.
- Implementation:** Requires 45 to 50 minutes for this assessment: 35 for team "design" activity, plus 7 minutes for reviewing documentation. Intended for teams of 4, but may be used for teams of 3 to 5. May use "tool" selected to fit a discipline or student interests. Requires 3 to 5 minutes to score each team's worksheets (their design product). Scoring scale and decision rules are provided.

INSTRUMENT DEVELOPMENT

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DESIGN TEAM PERFORMANCE ASSESSMENT

Team Name: _____

Date: _____

OVERVIEW

Objective: Demonstrate your ability to work as a team, to employ the engineering design process, and to use effective design communication to accomplish your design assignment.

Assignment: Your group is charged with developing a **testing procedure** to convincingly show how well an assigned hand tool (or other device) **satisfies one key customer expectation**. Your testing procedure should be described such that another engineer could independently implement your procedure and obtain the same test results.

Tool: _____

Customer: _____

Criteria: Your performance, as reflected in your Team Design Log (attached), will be judged based on criteria generally expected of engineering design teams in industry (e.g., work quality, value to client, completeness).

Time: **35 minutes** of “design” activity, followed by **7 minutes** to review documentation

TEAM DESIGN ACTIVITY (35 MINUTES)

- Organize yourselves into an effective team for this assignment.
- Identify important features that customers would expect in the assigned hand tool, select the **most essential feature** from your list, and **justify** your selection.
- **Create a testing procedure** to evaluate the extent to which this **one** (most essential) feature of the tool meets customer expectations. Note: The testing procedure you define must be suitable for others to implement without additional clarification from you.

DELIVERABLES

One copy of your team’s Design Log

RESOURCES AVAILABLE TO YOUR TEAM

- Tool specimen and associated product information
- Team Design Log worksheets
- 35 minutes of team “design” time
- 7 additional minutes to complete/validate your worksheets

TEAM DESIGN LOG

Sheet 1

Team: _____ Date: _____

- A. Describe your team organization and member responsibilities assigned to ensure that your team can complete this activity effectively and in the 35 minutes allotted.*

TEAM DESIGN LOG

Sheet 2

B. Identify customer expectations of the tool (list and give a brief explanation of each).

<u>Expectations</u>	<u>Explanations</u>
•	
•	
•	
•	
•	
•	
•	
•	
•	
•	

C. What source or sources of information did you use to aid in identifying customer expectations?

D. Identify the most essential customer expectation. Justify your selection.

TEAM DESIGN LOG

Sheet 3

*E. Describe a complete testing procedure for your **one selected** feature. Itemize steps. As appropriate, include sketches or specifics about data collection and analysis.*

SCORING CRITERIA

DESIGN TEAM PERFORMANCE ASSESSMENT

Team Name: _____

Date: _____

Scorer Instructions: Check each criterion (listed below) as it is evidenced in student responses.
Student scores are the number of criteria checked.

CRITERIA FOR DESIGN TEAM PERFORMANCE

Question A

- ___ **Leadership:** Team leader assigned or shared leadership indicated
- ___ **Time/task management:** Timekeeper assigned or time allocated to steps
- ___ **Roles/responsibilities:** Appropriate additional roles or responsibilities assigned

Questions B & C & D

- ___ **Needs identification:** listed at least 5 customer needs
- ___ **Needs definition:** explained at least 3 needs
- ___ **Information sources:** identified at least 2 sources
- ___ **Problem definition:** selected only one customer expectation as most important
- ___ **Decision making:** selection is rationally justified as valuable to customer

Question E

- ___ **Idea generation:** listed relevant ideas for testing selected customer expectation
- ___ **Solution implementation:** defined detailed steps for at least one testing procedure
- ___ **Performance sampling:** considered variability/replication of test results
- ___ **Performance metrics:** defined quantification for test results
- ___ **Evaluation:** provided criteria for tool to pass the test

Total DESIGN TEAM PERFORMANCE Score (maximum = 13)

DECISION RULES FOR SCORING DESIGN TEAM PERFORMANCE ASSESSMENT

Question A

- A.1. Credit is given if a student lists a key word (a word listed within a criterion definition) in the proper context.
- A.2. “Staying on task” does NOT satisfy the “time/task management” criterion.
- A.3. Credit is given for “time/task management” if the process of time management or the role of timekeeper is recorded.
- A.4. Credit is given for listing team members AND associated roles or responsibilities.

Questions B & C & D

- B.1. For “explained at least 3 ideas” the team’s explanation of the customer’s expectations must be distinct from the expectation itself. The explanation can be a definition or a defense of the expectation. Appropriate punctuation should separate the expectation from the explanation such as parentheses, hyphen, comma, semicolon, etc.
- C.1. Sources must be different, so two items from packaging counts as only one source.
- D.1. Credit will be given for “selected one customer expectation” if one and only one feature is listed. Credit will NOT be given if multiple customer expectations are listed.
- D.2. Credit is NOT given for “selection is rationally justified” if the justification is only a definition of the selected feature. Justification of the selected tool feature must involve comparing or contrasting, or stating the significance of the feature.

Question E

- E.1. Credit for “relevant ideas for testing” shall be based on the most essential customer expectation, as recorded on Team Design Log Sheet 2.
- E.2. Credit for “detailed steps” requires that details be given for at least one test procedure, and two individuals could duplicate the test by following these steps.
- E.3. Credit for “variability/replication of test results” means the same test is performed on multiple tools, or it is repeated on one tool. A data point should be taken for each replication so that multiple data points measure the same variable.
- E.4. Credit for “quantification for test results” requires the team to define the dependent variable being measured (e.g., pressure/force midway down the handle). It does NOT refer to quantification in the test procedure itself, but quantification in the measure.
- E.5. Credit for “criteria for tool to pass test” requires the team to specify the target or tolerance that is acceptable. It does not need to be quantitative, but it must describe conditions of acceptance or failure. If two individuals used these criteria, they would come to the same conclusion about acceptance or failure.