Introduction to Engineering Design with Professional Development I (ENGR 2050)
Classroom Lab Activity

Activity 03-1	Mission Statement and Customer Needs
Textbook Reference:	Ulrich & Eppinger, Identifying Customer Needs & Product Specifications
Purpose / Goal:	To understand how a mission statement helps guide team activities. To understand how to fully explore and document customer needs.
Materials / Resources Required:	Laptop, User Needs / Functional Analysis and Customer Data templates from the previous activity, Mini-Project documentation
Time Allocated:	1 hour

Description

Using the User Needs / Functional Analysis for your mini-project and the overall Mini-Project documentation as the context for this activity, you and your partner will seek:

- to define a unique mission for your team
- to extract the key customer needs

The process you are following is detailed in chapter 4 of the textbook.

Table 1 - Mini Project General Mission Statement

Benefits	A project-based experience that motivates students to learn about the engineering design process
Goals:	Can be completed in about four weeks, inexpensive components, safe, challenging, appeals to a broad cross section of multidisciplinary interests and is fun.
Primary Markets:	RPI engineering students
Secondary Markets:	Prospective RPI engineering students
Assumptions:	• Satisfies competition requirements as specified by assignment • Students learn about interpreting customer needs into design specifications, concept development, and prototyping • Can't be easily copied off the internet
Stakeholders:	IED Instructors

Mission Statement

Table 1 - Mini Project General Mission Statement provides the overall mission statement for the Mini-Project. It is based on Exhibit 4-3 in the textbook. Use the material and topics from the figure and customize it to reflect your team's particular mission statement. Clearly defined mission statements are brief and to the point. These help teams focus on their overall goals & objectives.

Customer Wants & Needs

The next step in identifying what the customer is looking for in a product is to develop an understanding of their "wants & needs". The following is a partial list of some possible wants and needs for the mini-project:

- I have limited time, so I'd like to have something that can be built with readily available materials.
- It must look cool with as many features as possible.
- I need to know exactly how much energy is required to meet basic requirements.
- Fit in my backpack without breakage.
- Be adaptable to varying competitive test conditions.
- Easy to assemble.
- Win the competition at all costs.
- Get an "A"
- Work reliably, especially on the day of the competition.
- Have fun!
- Be safe
- Inexpensive components
- Pertain to my disciplinary interests and capabilities.
- Hands-on

Review the Customer Data templates you created in the previous activity. Although those define, in customer terms the likes and dislikes of your customers, they are not directly actionable from an engineering viewpoint. From those templates and the above list of ideas, generate a specific table of wants and needs for your mini-project. These should be ranked in order of importance to your customer to help ensure that you address the items of highest priority. Table 2 - Interpreted Customer Needs provides an example of this.

Table 2 - Interpreted Customer Needs where 5 is Most Important

No.	Customer Needs	Importance
1	Fit in my backpack without breakage.	3
2	Adaptable to varying competitive test conditions.	4
3	Satisfy basic requirements for the competition	5
4	Look cool with as many features as possible.	3
5	Work reliably, especially on the day of the competition	5

Customer Needs

Using the material provided in the Mini-Project documentation, what additional raw customer data can you extract? Create another Customer Data template and fill that in using this "new" data.

Use the guidelines shown in Exhibit 4-7 (page 63) to interpret these raw statements of customer needs and wants. Update your interpreted customer needs table (Table 2) as needed with this new information.

Customers and Stakeholders

In the next activity you will identify and document the project stakeholders. You will then focus on completing the definition of your customer needs and then translating them into technical specifications. As you do, consider the following questions:

- Are any customer needs missing?
- Are any customer needs redundant? Can any be eliminated?
- Which customer needs require more investigation?
- Do any of the customer needs prescribe how the concept should be implemented?
- Which customer needs are the most important?
- Which customer needs are the most difficult to implement?