

ENGR 310 Problem Definition Assignment

Engineering design projects generally start with the recognition that a need or opportunity for an engineered solution exists. Accomplished designers first seek to clarify the problem by understanding user needs, client wants, and the context in which the designed system will function *before* giving too much thought to solution ideas. The goal is a deep yet solution-independent understanding of the project goals and various issues that may affect the success of the design.

Each team will develop a definition of their design problem that formalizes the needs, objectives, and constraints for their term project. It will contain the following elements.

1. Needs Description – A clear statement of what the need or opportunity is, with appropriate contextual information to make it understandable to someone not familiar with the project.
2. Stakeholders – A list of key stakeholders and their role (i.e., what they potentially have at stake), separated into categories. The categories should include users and clients at a minimum, but can include others as appropriate. Discussion should describe how the team identified stakeholders and their needs/wants.
3. User Needs – A set of user’s needs and desires with respect to the problem topic. To identify these, first gather data through direct observation and interviews with actual potential users (*must be non-team members!*), then identify user needs and desires, and describe them adequately using appropriate media (words, sketches, pictures, video, etc.).
4. Competitive analysis – Research existing solutions to the problem identified. Research should include a patent search, catalog searches, and internet searches as appropriate. Evaluate the pros and cons of each solution.
5. Project Goal – A clear statement of what your team will accomplish this semester.
6. Objectives tree – A hierarchical organization of the complete list of design objectives for this project, starting with the main design goal. This can be reported in graphical or outline form.
7. Constraints – A list of the key constraints, quantified wherever possible. They can be incorporated into the objectives tree (appropriately differentiated from objectives) or in a separate table or list.

The document should be written in appropriate technical writing style, be well-organized and neatly presented, and flow seamlessly from one section to the next. The quality should be sufficiently high so that it could be given to a prospective client without embarrassment. Place the document behind the appropriate tab in your team binder. Include supporting data as appropriate. Problem definition is due the day before your recitation section meets the **week of Feb. 11**.