

1.6 Engineering Design Process

Part 1 – Understand: Research

Summary

Students study how and why engineers perform research about a problem. Students research their selected design problem and summarize what they find.

Learning Objectives

After this class, students will be able to:

- List the sources to which an engineer might look when performing research.
- Find and summarize information from sources for their own research.

Materials

- Computers with internet access.

Time

80 minutes

Procedure/Pacing

Research Review

1. Review the “Why” and the “How” of engineering research:
 - a. Why?
 - Determine what others have tried.
 - Find analogies in other fields.
 - Possible solutions in nature.
 - b. How?
 - Reverse Engineering
 - Literature or Patent Searches.
 - Observation of natural processes.
2. Have students meet in their groups to briefly discuss how they will approach research for their Design-Your-Life problem. Individuals should perform their own research, but groups may want to outline areas in which each member will concentrate. For example, if the problem is to design a better method to get out of bed in the morning, one student might research what wakes people up naturally, another might research existing types of waking devices through patent

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searches, and another might research studies on waking in scholarly literature.

3. Students should summarize each of at least 3 things they researched that are related to the Design-Your-Life problem. (Assignment 1.6i)

In-Class Assignment

Assignment 1.6i: Research

Resources

Google Patents (Google search engine for the USPTO)

<https://patents.google.com/>

Google Scholar (Google search engine for scholarly literature)

<https://scholar.google.com/>

Homework

Assignment 1.7h: Engineering Design Process Part 2 – Design

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