ENGR101H1 - Engineering Design

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1 Introduction to Engineering Design

Engineering design is a systematic approach to solving problems through creativity and innovation.

1.1 Design Process

The engineering design process includes stages like:

- Define the problem
- Research and gather information
- Generate potential solutions
- Evaluate and select solutions
- Implement the solution
- Test and iterate

2 Problem Definition

Clearly defining the problem is critical for successful design.

2.1 Problem Statement

A concise description of the issue that needs addressing.

3 Research and Information Gathering

Conducting thorough research helps inform design decisions.

3.1 Sources of Information

Consider academic articles, books, online resources, and industry reports.

4 Brainstorming Solutions

Encouraging creativity during the ideation phase is essential.

4.1 Techniques for Brainstorming

- Mind mapping
- Sketching ideas
- Group discussions

5 Prototyping

Creating prototypes allows for testing ideas in a tangible form.

5.1 Types of Prototypes

- Low-fidelity: Simple models (e.g., paper prototypes).
- High-fidelity: More detailed and functional prototypes (e.g., 3D printed models).

Note to self: Refer to Tinkercad profile for prototyping designs.

6 Testing and Evaluation

Testing prototypes is vital for assessing performance.

6.1 Evaluation Criteria

Consider functionality, usability, safety, and cost-effectiveness.

7 Iteration and Improvement

Design is an iterative process. Feedback should inform revisions.

8 Communication in Design

Effective communication is key in engineering design.

8.1 Documentation

Maintain clear documentation of the design process for future reference.

9 Ethics in Engineering Design

Engineers must consider ethical implications in their designs.

9.1 Professional Responsibility

Designs should prioritize safety, sustainability, and social responsibility.

10 Final Project

The course culminates in a final project that synthesizes the design process.

Note to self: Refer to [Course Code] folder in cloud drive for project resources.