

Technology 190 – Senior Project

Lesson Plan, Week 2

Introduction to the Mechanical Design Process

Course Overview:

Technology 190 is the Senior Capstone class for a Bachelor of Science degree in Industrial Engineering. Along with other coursework, students will identify and develop a project to demonstrate their ability to apply the technical knowledge they have accumulated toward their degree.

Duration of lesson: 3 hrs

Textbook: none

Objectives for this lesson:

- Introduce students to the broad topic of design and make them aware of the unique characteristics of mechanical design
- Understand the necessity of defining and using a robust mechanical design process
- Understand how the Product design process relates to the Product Life Cycle
- Understand how the outputs of each stage of the design process become the inputs to the next stage
- Gain awareness of the iterative nature of design

Summary of lesson:

Introduce & discuss the concept of design in its broadest sense

Importance of having a Mechanical Design Process

Discussions on the synthesis of design

Aware state and un-aware state

Defining design criteria for evaluating concepts

Introduction to the “System” concept of design

In-class exercise – Packaging design constraints

In-class exercise – Municipal bus system

In-class exercise – sharing & discussion of personal design experiences

Introduction to The Mechanical Design Process

Relationship to Product Life Cycle

Mechanical Design Process vs. Scientific Process

Evolution of the modern design process

Detailed breakdown of The Mechanical Design Process

Planning

Concept Development

Development of a product specification

Understanding how the customer defines quality