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MAE 305L

**Design Project**  
Preliminary Report  
Spring 2008

# Overall Goals

- The Design Project assignment you received today constitutes a Request for Proposals (RFP)
  - Statement of the problem that the customer wants you to address
  - Detailed requirements: the successful solution to the problem must satisfy all these requirements
- Each team is being asked to respond to this RFP
  - **Preliminary Design Report** – your team's proposed solution to the problem (Due 19 February 2008, 2:00 pm)
  - Final Design Report – detailed design and instructions for use (Due 25 March 2008, 2:00 pm)
  - Demonstration and delivery of the finished article (24 April 2008)

# Preliminary Design Report (PDR)

- The PDR is a proposal to the customer
- The PDR should communicate to the customer that your team:
  - Understands the problem and the requirements
  - Has a solution that will solve the problem and address all the requirements
- Ultimate goal of the PDR is to convince the customer that you have a solution that is worth pursuing to the next phase (detail design)

# PDR Format

- The PDR must be organized according to the outline below:
  - Cover Page
  - Problem Definition
  - Design Concept Description
  - Analysis of the Design Concept
  - Summary and Conclusions
- Each of these elements must be in this order and begin on a new page
- Additional details on each of these elements are given in the following

# Cover Page

- Contents are:
  - Title, something like  
Bottle Opener Fabrication Fixture  
A Preliminary Design Proposal submitted to:
  - Customer names
  - Course number and name
  - Semester
  - Submitted by:  
Names of team members
  - Date

# Problem Definition

- Problem Definition section should include:
  - General statement of the problem
  - Detailed requirements
  - Any additional considerations arising from your understanding of the problem
  - Must include a drawing of the part your fixture is designed to produce
- Don't hesitate to use the same words used by the customer in the RFP

# Design Concept Description

- A description of your proposed solution
  - Describe in general terms the configuration of your preliminary fixture design
  - Describe specifically how your fixture will be used to make the part
    - Major components and the function of each
    - Refer to the labeled drawing of the part
    - Refer to labeled sketch(es) of your preliminary design solution
  - Describe how your design addresses each of the customer requirements
    - Use of reference points to generate reproducible tool paths
    - Accurate location of blank in fixture
    - Accurate location of fixture on milling machine table
    - Clearance between cutter and fixture
    - etc.

# Analysis of the Design Concept

- Demonstration that blank is securely held in fixture during all machining processes
  - Consider cutter forces and moments, and the reactions imposed by your clamping system to maintain the blank in static equilibrium
  - Consider clearance between cutter and fixture, cutter and milling machine during all tool paths
  - Use properly labeled free-body diagrams as needed to clarify your description

# Summary and Conclusions

- Your final message to the customer

# Use of Sketches

- Sketches are informal drawings
- Used as an overview to convey general concepts and assist in visualization, usually in isometric view
- Lack sufficient detail to build the part(s)
- Suitable and appropriate for PDR
- Should be computer-generated
- Must be neat, clear, and labeled as needed
- Intended to clarify the written descriptions

# Summary

- The PDR communicates your understanding of the problem, and your proposed solution to the problem
  - Organized in conformance with customer requirements as described herein
  - Neat
  - Concise
  - Contain sketches/figures as needed to illuminate key points