

## **ME/Mfg 452 Design for Manufacture**

**Winter 2004**

### **Project Guidelines**

#### **Team Project**

Each student will be part of four-member project team. The team redesigns a manufactured product of their choice (a power tool, toaster, portable CD player, kitchen appliance etc). The goal is to first understand the product functionality, materials, and manufacturing methods used and then to identify opportunities to improve the quality, or reduce the cost (number of parts), enhance the functionality. The team is required to apply each of the methods discussed in the class to enhance the product's value. The project work involves hands-on dissection of the product, application of DFM methods, drawings and computer models of the improved design with a clear demonstration of how proposed design improvements positively impact the quality and cost. Physical prototyping is not required.

#### **Project Team Formation and Project Selection**

##### **On-Campus Students**

Project teams and the project topics should be finalized by **January 14**. A one-page description of the project and the team is due on **January 16 by 5PM**.

Due to fairness in grading, students will not be allowed to work on a current ME450 project or a current SAE type project. However, students can work on past ME450 projects or past Global Product development course projects provided they have complete access to the final report and the prototype. This will help establish the starting point in your redesign effort and avoid any duplication of efforts.

##### **Off-Campus Students**

During the first week the instructor will provide all off-campus students with proposed teams of three to five members based on student location. Students at a site with less than three students will be teamed with distributed members from other sites with fewer than three students. Teams will be constructed within the same company where possible, but inter-company teams may need to be assigned to accommodate all students.

Off-campus students are strongly advised to choose a project that is work related. Off-campus student teams should get instructor approval on project ideas that are not work-related. If necessary, instructor will sign a Confidentiality Agreement. All project teams are required to make a final project presentation. Sensitive material may be stripped from the presentation to

protect the intellectual property. Such issues can and should be resolved with your instructor without hindering the quality of your project. It is important you work on project that has the potential for a reasonable payoff to your company.

### **Guidelines for Project Selection**

- **Moderate Scope and Complexity.** Choose a product with about eight or more different components (not counting the fasteners) and that is mass produced (say at least 10,000 units). This will give you opportunities to explore part consolidation, alternate fastening methods, alternate materials and manufacturing. Additionally, if the manufacturer of the product you chose produces a family of such products (Sony Portable CDs, automotive door-latches) the scope may include optimizing the design to increase commonality (share features) without sacrificing customer or performance requirements.
- Each team is required to purchase one unit of the product they chose to redesign. Look for used products. A \$20 expense per team member is recommended. You are required to take apart the product completely to study function, geometric features, materials/manufacturing. Therefore, you might not be able to put it back together to function properly.
- **Interest/Hobby:** Identify a product which at least one of your team members has had a lot of experience using it and as a result has ideas for how it can be improved. For example, a mountain bike, camera, exercise/fitness equipment or accessories.
- **Size/Portability:** You will need to transport your product to/from team meetings, class presentation etc. Choose a product that is less cumbersome to do so.

### **Examples of Successful Past ME452 Project Products**

Alarm Clock	Instrument Panel	Electric Toothbrush	Can Opener
Dust-buster	Toaster	Modular Fish-Tank	Portable CD Player
Barbeque Grill	Paper Shredder	Beer Tap	Multi-Use Pocket Tool

### **Additional Project Ideas**

1. Power Tools: hand drill, orbital saw
2. Office Products: printers, copiers, computer mouse (or video game controller)
3. Kitchen/Home Appliances: coffee maker, blender, grinder, juicer, quick chop, vacuum cleaner, hair dryer, humidifier, handy-stitch, sewing machine
4. Toys: Difficult to find good candidates since the cost-reductions are generally well addressed
5. Exercise/Sports Equipment: basketball hoop assembly, binocular