

EIN 4621 – Manufacturing Processes **Course Team Project**

Design proposal due on October 15 (Monday)

Initial CAD drawing of the prototype with dimensions and tolerances due on October 22 (Monday)

Final CAD drawing of the prototype with dimensions and tolerances due on October 29 (Monday)

Prototype and report due on November 28 (Wednesday) (at the beginning of the class)

As the manufacturing team of a company, your team has been assigned to design, implement, and manufacture the *prototype* of a new product for the customers. Your team is free to select any specific product subject to the specified constraints. The dimensions of the product cannot exceed 2" x 4" x 0.5" and will be made through either rapid prototyping or CNC milling machine. Some examples include but are not limited to USB drives, handheld electronic devices (e.g., cell phones, mp3 players, etc.), protective covers for devices, USF key chains, customized products, etc. The main objective for the team is to design a new product that is novel, attractive, functional, and that can be manufactured while minimizing the total manufacturing time and cost. Your team will also need to provide the design and process plan for the production of the *actual product* assuming your team has access to any material and all the manufacturing machines. Your project report and presentation should convince the managers that your product design is novel, functional, cost-effective, and feasible for manufacturing.

The design proposal should consist of a one-page drawing sketch (manual or computer-made) with clear information on dimensions and functionality.

The requirements for the semester project report are as follows:

- 1. Cover page.** (1 page). Title of the project and names of all the participating team members.
- 2. Project Description and Business Plan.** (1-3 pages)
 - (a) Objective.
 - (b) Description of the actual product design.
 - (c) Identification of potential customers for the product and potential annual market.
- 3. Product Design and Engineering Specification.** (2-3 pages)
 - (a) CAD design/drawing (front, top, side, and isometric views) of the product with dimensions and tolerances.
 - (b) Material requirements for the *actual* product (type of material, dimensions of material).
- 4. Process Plan and Tooling for Manufacturing.** (1-2 pages)
 - (a) Description of the manufacturing process used to manufacture the *prototype*.
 - (b) Selection of manufacturing processes, tools and machines to be used for manufacturing the *actual* product.
 - (c) Sequence of operations for completing the *actual* product.
- 5. Time Table for Completion of the Prototype.** (1 page) Time table and task assignment (to each team member) for completion of the project.
- 6. Results and Illustrative Examples.** (3-5 pages)
 - (a) Illustrative examples of the manufacturing process steps and result for the *prototype*.

- (b) Illustrative examples of the manufacturing processes for the development of the proposed design product (*actual* product), and the expected final product to be launched to the market.
- (c) Suggestions on the future development plan for mass production of the actual product.

Requirements for the Semester Project:

1. The project will be graded based on the following:
 - (a) Originality, functionality, cost-effectiveness, and manufacturability of the prototype and the proposed actual product.
 - (b) Adequate selection of materials, manufacturing processes, tools and machines for manufacturing the *actual* product.
 - (c) Completeness of the project report and adherence to the requirements shown under “*Requirements for the Semester Project Report*”.
 - (d) Final presentation.
2. Each team will design and manufacture their own product.
3. Each team will make the prototype limited to dimensions of 2” x 4” x 0.5” and using the rapid prototyping machine and/or the CNC milling machines available in the manufacturing lab.
4. Each team will optimize their product design to minimize manufacturing time and cost.
5. After the code has been generated and checked, it has to be approved by the TA before starting the manufacturing.
6. **No manufacturing will be allowed in the manufacturing lab without the presence and supervision of the TA.**
7. **Always follow the safety guidelines as described in Lab I.**

Requirements for the Semester Project Report:

1. Each team will submit a typewritten report describing the product design, development, and results.
2. The report is to be submitted in 8.5” x 11” paper with 1” top, bottom, and side margins. The font to be used is 12-point Times New Roman or other similar-sized font throughout the report, except for headings, sub-headings, cover page, figures and tables. 1.5 line spacing with full text justification.
3. Clarity and thoroughness of the report, and good use of the English language, including grammar, spelling and punctuation, are considered in grading the project report.
4. The report must be typed and have a professional appearance. Sloppy work may cost you points.
5. Clarity of presentation of the results is an element of the grade.
6. If there is any information or data obtained from other sources, you should cite the appropriate source in the References. **Do not directly copy designs from other sources as these designs may be protected.** Research ethics and responsible authorships should be followed (as an engineer) in this course. For more information about academic dishonesty, please refer to the USF Policy on Academic Dishonesty and Disruption of Academic Process at <http://www.ugs.usf.edu/catalogs/0203/adadap.htm>.
7. **No late project report** will be accepted.
8. Your team will present your product design and prototype in a presentation at the end of the semester. More information about the presentation will be provided a few weeks prior to the presentations.