

GC120 TERM PROJECT REQUIREMENTS

Rationale

The concepts covered during the semester are designed to give students the skills that enable them to create an accurate description of a moderately complex design. This term project is intended to provide a culminating experience whereby students have the opportunity to exercise the knowledge, skills, and judgment developed in the course.

Project Requirements

Phase 1 - Re-create an existing design

For the term project choose a moderately complex assembly of 5-8+ parts, and create basic documentation that can be read, interpreted, and understood by manufacturing personnel.

- Become familiar with the parts and assembly by dis-assembling it in order to gain access to all parts measurements.
- Use calipers to measure and document all of the dimensions required to fully define the parts. Think about the standards for your dimensions (units, precision, and dimensions between mating parts).
- Create 3D solid models with proper design intent, an assembly, and CAD documentation via Solidworks as outlined below.

Phase 2 - Modify the existing design

Modify the existing design by modifying/improving an existing part or create a new part that improves the existing designs functionality. This design improvement should be a thoughtful effort so that the new design is purposeful.

- Create technical sketches of your modified or new part as outlined below.
- Provide rationale behind your modified design with a visual representation (compare existing to new if modified).
- Add modified/new part to your assembly and create CAD documentation of the part via Solidworks.

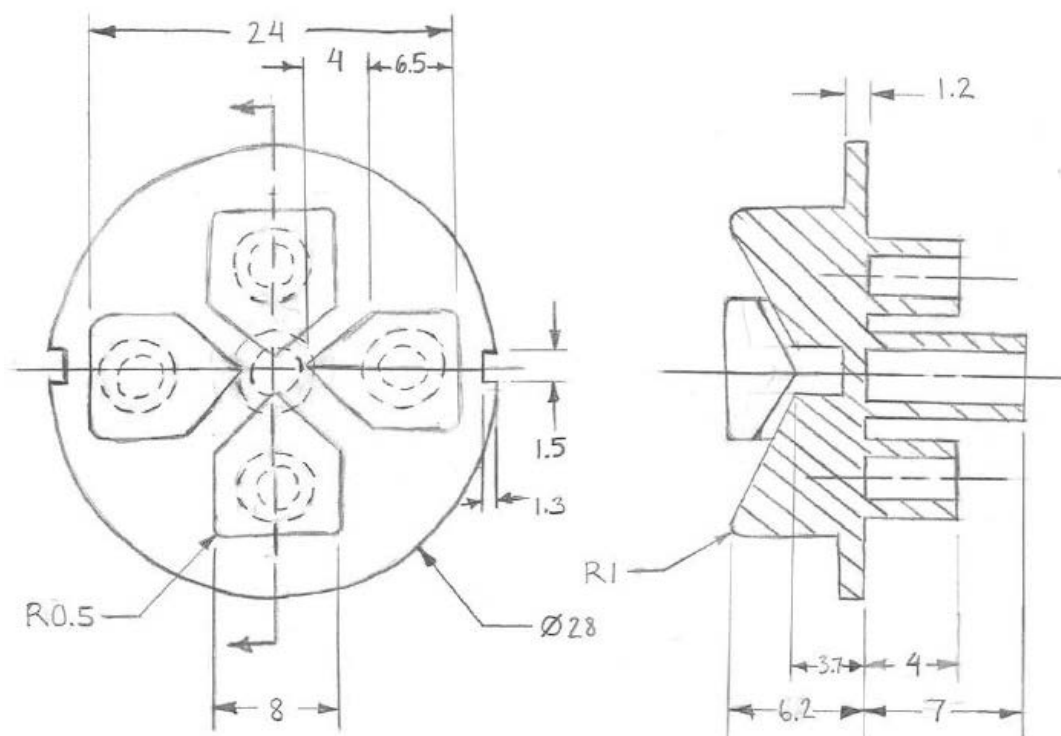
Project Components (All sketches and CAD drawings should be turned in with a border and completed title block)

I. Technical Sketch of the modified/new part (20%) - Create an orthographic sketch demonstrating proper multi-view layout, conventional practices, and correct dimensioning technique. A section or auxiliary view may be required to properly describe the part. Revise sketches as needed for a high quality accurate representation. You may use graph paper or blank paper with a title block.

Evaluation

- ✓ Accuracy of depicted orthographic views
- ✓ Annotations
- ✓ Line type
- ✓ Quality
- ✓ Title block

Example of an Orthographic Technical Sketch:



II. 3D Solid Models (20%) - Create 3D Solid Models of each part including the modified/new part. Use proper modeling procedure and design intent to correctly create parts via Solidworks. Save using appropriate part names and materials, and submit all electronic files to moodle as directed.

Evaluation

- ✓ Model orientation and procedure
- ✓ Accuracy and constraints
- ✓ Material assignment
- ✓ Naming convention

III. CAD Drawings of 5 parts including new part (20%) - Create a detail drawing of 5 parts including your new part via Solidworks and include all information necessary to manufacture the parts. At least one drawing must include a specialty view. This should include: shape description (orthographic views, sectional views, and auxiliary views), size description (dimensions), notes, and title block information.

Evaluation

- ✓ Accuracy of depicted views + specialty view
- ✓ Annotations
- ✓ Line type
- ✓ Quality
- ✓ Title block

IV. Assembly and CAD Assembly Drawing(s) (20%) - Create a working assembly via Solidworks of all parts represented in their correct position including the *modified/new part*. In addition, submit a CAD drawing with collapsed and exploded pictorial views of the assembly, and a bill of materials with identification. Submit all electronic files to moodle as directed.

Evaluation

- ✓ Correct mates/relations between parts
- ✓ Appropriate orientation of assembly
- ✓ Proper collapsed and exploded drawing representation
- ✓ Bill of materials with identification
- ✓ Title block

V. Project Portfolio (20%) - To display your work in a professional manner, submit your term project to the instructor with the following components in the given order.

Hardcopy Deliverables

1. *Title Page with rendered assembly* (rendered assembly, title, name, section, semester, and date)
2. *Rationale (typed) behind modified design with visual representation*
 - Isometric representation of modified versus original part (screenshots)
- or**
- Isometric representation of newly designed part (screenshot)
3. *Technical Sketch of the modified/new part*
4. *CAD Drawings of 5 parts including new part*
5. *CAD Assembly Drawing(s) with Bill of Materials*
6. **Evaluation Sheet**

Digital Deliverable

7. **Compressed Folder - Upload to Moodle submission link** (All digital project and Solidworks files)

Note: After uploading compressed folder to Moodle, verify that it is not corrupt by downloading and opening assembly.

Reference Material

1. Information on Solid Modeling - Solidworks Tutorials.
2. Three Dimensional Modeling - Chapter 4 in Bertoline/Wiebe.
3. Shape Description/Drawing Layout - Chapter 5 in Bertoline/Wiebe.
4. Auxiliary Views - Chapter 6 in Bertoline/Wiebe.
5. Sectional Views - Chapter 8 in Bertoline/Wiebe.
6. Dimensioning Practices - Chapter 9 in Bertoline/Wiebe.
7. Fastening Devices and Methods - Chapter 10 in Bertoline/Wiebe.
8. Working Drawings - Chapter 11 in Bertoline/Wiebe

TERM PROJECT EVALUATION SHEET



Student Name: _____

I. Technical Sketch of the modified/new part

20 points _____

- ✓ Accuracy of depicted orthographic views ----4 3 2 1 0
- ✓ Annotations ----6 5 4 3 2 1 0
- ✓ Line type ----4 3 2 1 0
- ✓ Quality ----4 3 2 1 0
- ✓ Title block ----2 1.5 1 .5 0

Comments: _____

II. 3D Solid Models of all parts

20 points _____

- ✓ Model orientation and procedure ----8 7 6 5 4 3 2 1 0
- ✓ Accuracy and constraints ----8 7 6 5 4 3 2 1 0
- ✓ Material assignment ----2 1.5 1 .5 0
- ✓ Naming convention ----2 1.5 1 .5 0

Comments: _____

III. CAD Drawings of 5 parts including new part

20 points _____

- ✓ Accuracy of depicted views + specialty view ----4 3 2 1 0
- ✓ Annotations ----6 5 4 3 2 1 0
- ✓ Line type ----4 3 2 1 0
- ✓ Quality ----4 3 2 1 0
- ✓ Title block ----2 1.5 1 .5 0

Comments: _____

IV. Assembly & CAD Assembly Drawing(s)

20 points _____

- ✓ Correct mates/relations between parts ----6 5 4 3 2 1 0
- ✓ Appropriate orientation of assembly ----4 3 2 1 0
- ✓ Proper collapsed and exploded drawing representation ----4 3 2 1 0
- ✓ Bill of materials with identification ----4 3 2 1 0
- ✓ Title block ----2 1.5 1 .5 0

Comments: _____

V. Project Portfolio

20 points _____

Hardcopy Deliverables

1. *Title Page with rendered assembly* (rendered assembly, title, name, section, semester, and date) ----4 3 2 1 0
2. *Rationale (typed) behind modified design with visual representation* ----10 8 6 4 2 0
 - Isometric representation of modified versus original part (screenshots)
- or**
- Isometric representation of newly designed part (screenshot)
3. *Technical Sketch of the modified/new part* ----1 0
4. *CAD Drawings of 5 parts including new part* ----1 0
5. *CAD Assembly Drawing(s) with Bill of Materials* ----1 0
6. **Evaluation Sheet** ----1 0

Digital Deliverable

7. **Compressed Folder - Upload to Moodle submission link** (All digital project and Solidworks files) ----2 1 0

Comments: _____

TOTAL: _____