

SHERIDAN COLLEGE
Faculty of Science and Technology
Mechanical Department

Course Code: CADD4013

Course Name: Advanced Rendering and Animation

Term project

Description:

The term project is a large assignment comprising five different tasks (or phases). These tasks are:

- Task 1 - Project Idea: selection, description and presentation
- Task 2 - Project 3D Modeling
- Task 3 - Project Assembly Drawings
- Task 4 - Project Storyboards
- Task 5 - Computer Presentation of project

Requirements:

Each task of the term project must be completed by a due date to meet the final deadline. These deadlines are identified in each of the individual task descriptions.

Each task will require a set of files and/or hardcopy to be submitted. See each task sheet for the relevant details.

Grading of the tasks:

The tasks will be graded in the following manner:

Task 1 :	10% of main project grade
Task 2:	20% of main project grade
Task 3:	10% of main project grade
Task 4:	15% of main project grade
Task 5:	45% of main project grade

Overall description of project:

Each student must select a mechanical object to model on the computer. For compatibility reasons with Autodesk VIZ (formerly 3D Studio VIZ) and 3DS MAX, it is recommended that Autodesk software be used. The mechanical object must be:

- A true representation of a real object: simplifying the object is subject to the approval of the Instructor.
- Contain at least six independent parts
- Contain at least four moving parts: these parts may be gears, linkages, etc...
- At least three of the moving parts must be linked: for example, intermeshing gears in a gearbox, linkages, etc..

Examples of such mechanical objects include: a gearbox, an arbor press, a three-hole punch, a mechanical robot arm (part of a larger assembly), an oil pump rig, the sorter mechanism on a photocopier....

The project idea must be approved by the course Instructor.

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Task 1 - Project idea: selection, description and presentation

Description:

Based on the criteria outlined in the project description, find a suitable mechanical object and discuss it with the Instructor for approval, then present it to the Instructor as a proposal.

Required:

The proposal must include the following:

- A written report describing the object and a list of the parts it is comprised of, including a brief description of the moving parts. This written description should not exceed four pages, and should be completed using Microsoft Word. Hand-written reports will be ignored.
- Accompanying materials for the report: This could be one or more of the following:
 - Photos of the object to be modeled.
 - References to articles in a magazine or book, with facsimiles of any illustrations.
 - Manual sketches of the object and its parts.
 - Computer sketch (or Iso) of the object and its parts.

Due:

Discuss your model with the Instructor by **Wednesday, week 3, (Thursday, May 20, 2004) at the latest**. You CANNOT proceed with the model unless it has been approved by the Instructor.

Present your project to the instructor on **Wednesday, week 4 (Thursday, May 27, 2004) at the start of class** using the written report and all accompanying materials.

Submit:

- ~~///~~ A copy of the written presentation on the X: drive – filename to be **T1*****.doc**, where **'*****'** is your login name.
- ~~///~~ A hardcopy of the project report and a copy of the accompanying materials (as much as is practical and as copyright laws permit).

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Task 2 - Project 3D Modeling

Description:

Using the materials from task 2, create preliminary sketches of all the parts of the Project. Using these drawings, construct a detailed computer model of the Mechanical object and its parts.

Requirements:

- It is recommended that you use any of the following software to create the model:
 - AutoCAD 2000 or equivalent (AutoCAD 2000i, 2002, 2004) (ACIS Solid Modeling)
 - AutoDesk Mechanical Desktop
 - Autodesk Inventor

Note: You may use other software to create the model, but you may find it difficult to transfer the data to Autodesk VIZ for the final animation.

- In AutoCAD: If possible, create each part on a separate layer, and avoid using excessive linetypes in the model.

- In order to avoid software and hardware limitations, use multiple drawings to create your model, then assemble the parts into one drawing. Keep a very close eye on the size of the .dwg files you are creating.

- Check the model for interference. This is a very common design error.

- The final assembled model (part and assembly files) should be smaller than 15 megabytes in size.

Due:

Submit an electronic copy of all files you created **before** the beginning of the **Thursday class on week 6 (Thursday, June 10th, 2004)**.

Place all the project files in a folder called **T2******* on the X: drive. This folder should contain all files (part files, assembly files, spreadsheets etc...) related to the completed model.

More details about the submittal will be given by the Instructor in class.

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Task 3 - Project assembly drawings

Description:

To effectively document a Project Idea near the end of a design phase, it must be properly drawn and recorded. This is accomplished by creating an assembly drawing of the object accompanied by several drawings detailing the necessary parts.

In this project, you will create the assembly drawings only.

Required:

Create **at least** two ISO views of the object:

- One showing the object in an exploded assembly
- One showing the object fully assembled.

The drawing sheet(s) should include:

- Exploded assembly with assembly notes:
 - Assembly part schedule.
- Assembled ISO view (may be on a separate sheet).

All drawing sheets should have:

- All required notes, titles, etc.
- Properly filled titleblock.
- Proper use of lineweights.

Note: The views must adequately represent the assembly and fully explain how the parts of the assembly fit together. You may find that you will need several additional views to accomplish this, especially if you have sub-assemblies in the model.

Due:

Submit hardcopies of all drawings at the beginning of the **Monday class on week 8 (Monday, June 28th, 2004)**.

Submit the electronic copy of the drawings to a folder named **T3******* on the X: drive.

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Task 4 - Project Storyboards

Description:

To properly create a final rendered presentation of the model, all the necessary steps should be documented and well planned beforehand. This can be accomplished in part by creating several storyboards of the project and its various elements.

Required:

Create **at least** three storyboards of the project:

- One showing the flow of the proposed final powerpoint presentation.
- One showing your proposed “assembly/disassembly” motion of the model.
- One showing the model looping through its standard motion.

The storyboards should include:

- A simple image and a description for each event.
- A **time base** running next to each image showing the estimated times elapsed in the storyboard.
- Extra notes and remarks (files required, etc..)

Notes :

- The images and descriptions must **adequately represent** the assembly and fully explain the flow of the finished presentations.
- **Be realistic:** do NOT create a “fantastic” storyboard that you will not have time or resources to complete later on. Keep extra “effects” to a minimum.
- **Read Task 5 carefully** before starting with the storyboards in this task – the goal is to meet all of the requirements in task 5 in your final presentation.
- **After storyboarding, be prepared to spend time every week on the animation to meet the final deadline (task 5)**– animations left to the last week will not be successful.
- Deviations from the storyboard may only proceed with **the approval of the Instructor.**

Due:

Submit hardcopies of all storyboards at the beginning of the **Thursday class on week 9 (Thursday, July 8, 2004).**

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Task 5- Computer presentation of project

Description:

The final task of the Project is the creation of a quality computer presentation of the model. The final presentation should be played back using Microsoft Powerpoint.

Requirements:

1. Prepare a quality computer presentation of the modeling project. The presentation must include:
 - A. An intro section:
 - Your name (NOT your code), Sheridan College and the Course name and code.
 - Title of the project.
 - Quick overview of the presentation sections.
 - B. The storyboard sections: (these can be in any order)
 - Identification of the Mechanical object, its use in real life.
 - The standard motion of the object.
 - Disassembly – reassembly of the object.
 - C. The summary section:
 - The end of your presentation. Show the best image or animation of the object.

Show the model to full effect using animation (AVIs or MPGs or MOVs) or rendered still images (BMPs or JPGs).

2. Rendered Images for the presentation are to **be produced using 3D Studio Max or Autodesk VIZ**. All titling and notes should be created **using Adobe Premiere**.
3. The resolution of all rendered images should **not** exceed 1024x768.... to further improve the speed and portability of the presentation, reduce the resolution further.
4. The playback resolution of AVIs and MOVs should **be** 640x480 or 800x600.... to further improve the speed and portability of the presentation, use the smaller resolution, and use a smaller animation window.
5. The combined total size of all expanded (not zipped or compressed) files should be less than 100 Megabytes. If you feel you will be exceeding this limit, discuss your project with your Instructor.
6. The total powerpoint presentation should run between 1 to 2 minutes then repeat.
7. The presentation should NOT have any animated backgrounds or objects – keep transitions between slides to a minimum.
8. Do NOT add any sound to the presentation.

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9. There should be a minimum of 10 rendered images, 4 of which should include shadows and some form of background.

10. Images may be rendered in grayscale. Colour is optional.

11. The name of the final powerpoint file is to be: CADD4013-2003-*****.PPT, where '*****' is your login name.

12. There should be an animation of the assembled model in motion, created in a looping fashion. This animation may be created in 3D Studio MAX, or Autodesk VIZ.

13. There should be an animation of the exploded assembly. This animation can be created in Autodesk VIZ or from Autodesk Inventor.

Due:

Submit electronic copies of all necessary files in one folder called **T5******* by **Thursday week 14, (Thursday, August 12, 2004) before the start of the final project presentation.**

Each student will be required to show their presentation in class that day.