CAD Lab Project Guidelines:

You can choose any mechanical system and design it using Solidworks. It should consist of features that we covered in the labs this semester. For example, Extrude, Revolve, Draft, Cut, Hole, Fillet/Chamfer, etc. Also, as much as possible, try to include mechanical components such as Gears, Bearings, springs, etc. If possible, create animation of the assembly.

Bill of materials, Assembly drawing, Exploded views (section views, if necessary), accurate dimensioning with tolerance specifications must be included in the project.

FEM analysis of a part of your project work is not mandatory but will be a nice addition to the project.

The format of the submission of the project should be as follows:

1. Abstract

   Typically, a paragraph outlining what is done in the project, what is the system that is modeled and brief one or two lines of conclusions

2. Introduction/Theory

   Explain the system that is being modeled in details in a scientific language. You may include some figures, equations, tables etc. if necessary.

3. Design of materials

   Justify the choice of materials selection for the parts of the project. This may depend on the loads that the components will be subjected. BoM may be presented in this section.

4. Solid model/Assembly

   Here, solid model figures will be presented that may include drawing views, 3D isometric views, assembly drawings etc. Dimensioning with tolerances should be clear in the drawings.

5. Analysis

   You may present the results of the system you modeled, which may include the comments on the animated assembly (if it is performing the function that you expected or designed for).

6. Concluding remarks/Future recommendations

   In this section, summary of the work may be presented in a brief manner; also the recommendations for the future improvement of the project can be outlined.

Following is the list of different topics that students in the past semester have worked on their projects.

1) Four cylinder engine
2) Multiple gear drive
3) The torque trencher
4) Partial Engine assembly with crankshaft, piston, timing belt
5) Can opener
6) Fluid pump with gear reduction
7) Tesla turbine
8) A car jack
9) A bicycle
10) A 3-hole punch
11) A table saw model
12) Transmission box
13) Ratchet mechanism
14) Dough mixer
15) Windshield wiper mechanism
16) Wheelchair assembly
17) Clamping device
18) TV Mounting bracket
19) Tomato dicer
20) A new design of a some commercial product e.g. phone, coffee machine.