**ECE 101: Group Rube Goldberg project description**

**Project description**

Engineering is all about doing projects – brainstorming ideas, researching and experimenting, managing your time and resources, working in teams, communicating your results. A main part of this class is a quarter-long, hands-on team project. You will be divided into teams of 4 - 6 people. The project is to build a Rube Goldberg contraption to accomplish a simple task of your choosing by the most complicated means possible. Projects will be judged on creativity, clever use of simple materials and the maximum number of steps to reach the goal. The constraint is that at least three electrical engineering elements must be included. For example, these could be using a dc motor to turn or move something, using a sensor to trigger a switch, using a digital logic circuit, an electromagnet, a timer, etc. Remember that you have access to LID – take advantage of it!

If you are not familiar with Rube Goldberg machines, here are some (more elaborate) examples:

http://www.youtube.com/watch?v=lCYg\_gz4fDo from the Mythbusters TV show

http://www.youtube.com/watch?v=8zN0J\_JFFi0 a high school class project

http://www.youtube.com/watch?v=1kvdq8cRNBM an elaborate one from a Japanese competition

Many more can be found online. For information on Rube Goldberg and the history of the competition, see http://en.wikipedia.org/wiki/Rube\_Goldberg.

Some materials will need to be purchased. You can check out components from the lab kit if desired (you will not get a grade in the class until they are returned!). I would estimate roughly that about $10 per person should cover additional materials. Also, to make things more interesting, we will make this a friendly competition. The class will vote for the best project and the winning team will win a small prize.

**Project report**

A written report as well as a demonstration is required. Each group turns in one report. The report should be neatly typed and checked for spelling and grammar. It should be clearly written and easy to understand. It is due during the finals week – check D2L for exact deadline. It should be submitted electronically on D2L in either Word or pdf formats.

The report should be 4-5 pages long (including graphics and references), or about 2,000 words. Use single spacing and 12pt Times New Roman font. Include the following sections (use them as section headings):

1. **Title** (with your names stated somewhere)
2. **Introduction**: explain the main objective of your project
3. **Technical description**:
   1. Explain your project in some detail, especially the electrical elements of the Rube Goldberg project.
   2. Provide at least one schematic, sketch, photo, plot or similar.
4. **Design process**: discuss how your group implemented (or not) the design process discussed in class and in textbook. It is OK to be honest so if you did not follow that process just state that and give your own description.
5. **Project management**: describe how you divided the tasks, how you checked progress, how frequently you met etc. List each member and their contribution. Discuss any team-related problems and how you resolved them. Did everything work out according to plan? State how much time your group as a whole spent on this assignment.
6. **Discussion**: how did your project work? What did you learn from doing this project? What would you do if you had more time to work on it? What do you think of this project for this class? Discuss anything else that you think of that I haven’t mentioned.
7. **References**: list up to 15 most important and relevant sources that you used during the project. Follow the format explained in individual project description.

A separate evaluation rubric will be posted and is very similar to the one used for the individual project.

Each of you will have to fill Peer-evaluation survey on CATME and evaluate your own and other members’ contributions. Individual score for the project will be adjusted according to their teammate’s evaluation of their contribution. I will not be using some sophisticated formula to calculate this score. Instead, I will be looking at the overall picture and possible signs of so-called “social loafing”, i.e. identifying if any member did not pull his/her own weight. If all your teammates think you were not doing your fair share then that will be reflected in your score. Small differences in individual contributions will not have any effect.