

MAE 415 – Analysis of Structures

Instructors: Bloebaum/Hulme

Final Project

Course exam period - Monday, December 11, 3:30-6:30, 108 O'Brian

Class web page: <http://www.eng.buffalo.edu/~clb/mae415.html>

Your final project in this course is already underway – the design and development of a model Trebuchet. The third and final phase of this project will serve as a second *re-design* of your initial Trebuchet. Your first re-design (Assignment #11) allowed you to gain insight on the operability of a Trebuchet by way of the on-line simulation tool. Using insight gained from this simulation tool, the “courtyard trials” of your Phase I and II models, AND with the aid of the VisualAnalysis software, we want you to re-design a *final* Trebuchet model. This, your Phase III model, will be the final measure by which you are remembered - **your legacy** - in MAE 415.

On December 11, you should plan to bring the following with you to the exam period:

1. A brief but thorough group report (10-12 typewritten pages) discussing and documenting the entire project. Your report should follow conventional writing format (i.e. Title page, table of contents, introduction, background, results, conclusions...). Plan to talk about the differences between your 3 designs, and insight gained/lessons learned from: courtyard trials, the on-line simulator, VisualAnalysis, visual inspection of competitor's designs, class theory, etc. ***Your report MUST also include a 1-paragraph description of task breakdown for your entire project. This will let the instructors know which group members participated, and to what extent they participated. A Table or Figure would be helpful.***
2. Plan to include VisualAnalysis Post-Processing results as part of your report. We encourage you to attempt to model your Trebuchet in both 2D and 3D. You might want to hand in charts and figures analogous to those handed in for the Portal Frame demo (i.e. displaced model, nodal and reaction forces, axial/shear/bending moment diagrams, etc.) **Most importantly – plan to discuss these results – what are they telling you? How/why is this helpful information?** Also, specifically discuss assumptions that might be made if you were to use Energy Methods (instead of FEM) to determine deflections of your model.
3. Your final, Phase III Trebuchet model. You should plan to practice launching peanut M&M's with your model **prior** to coming to class. Be ready to show your instructors and colleagues that your design works, and works well!!
4. A **5 minute** slideshow presentation (MS PowerPoint is strongly encouraged). There will be a projector and laptop computer on sight, so simply bring a floppy or zip disk with you loaded with your slide show. Hence, there will be no need for you to waste time/money printing up hard copies of your slides. **Note: practice your presentation before coming to class, and DO NOT GO OVER THE ALOTTED TIME PERIOD.**