MCHE 201: Introduction to Engineering Design
Spring 2019 – Mini-Project 1

Assigned:	Thursday, January 17th
Tower Build:	Thursday, January 24th
Report Due:	Friday, February 1st, 5pm

Assignment: Design a tower to support a tennis ball as high as possible. Write instructions to construct the tower.

The design process and results should be reported in no *more* than 2 pages of text, excluding figures.

Instructions: The instructions should be printed and brought to class on January 24. The first page should include:

- your team number, and
- each of your team member's name and contact information.

There are no other formatting requirements for the instructions.

Report: The project report should be submitted by 5pm on February 1 via email:

- to `joshua.vaughan@louisiana.edu`
- with subject line `TeamX-MCHE201-MP1` where the `X` in `TeamX` is your team number, and
- all team members copied on the submission email.

The email should include a single pdf of the report with file name `TeamX-MCHE201-MP1.pdf` where the `X` in `TeamX` is your team number.

Note: Submissions with incorrect filenames or submitted as multiple images/pdfs will be rejected.

1 Assignment Details

1.1 The Tower

The tower should be designed to stably-support a tennis ball as high as possible. The only construction materials to be used are 4-ounces of uncooked spaghetti and one roll of office, "Scotch-style", tape. Each tower is to be based in an American Letter-size (8.5 × 11-inch) piece of paper, placed flat on a table. The tower base must be completely contained within the piece of paper, and it can only attach to the piece of paper. Neither the piece of paper nor the tower can be secured to the table or any other surrounding objects in any way. The tower must be built in less than 45 minutes. The height of the tennis ball must be recorded *within* the 45 minute construction-time allowance. The tower that is able to support the tennis ball highest above the table surface will be declared the winner.

1.2 Project Timeline and Deliverables

Each team will develop a design for a tower and write instructions for building it. Then, another team will build the tower. Following construction of the towers, each team should document the construction (sketch and take pictures) and note where it deviated from their intended design. The timeline for the project is shown in Table 1.

Table 1: Mini-Project 1 Timeline

01/17/19	Team Assignment and Design Session
01/24/19	Deliver Instructions for Construction of the Tower
01/24/19	Tower Construction Competition
02/01/19	Report on Tower Design and Performance Due at 5pm

1.3 Reporting

The tower design and results should be reported in no *more* than 2 pages of text, excluding the abstract and figures. The report needs to present the design of your team's tower, assumptions made during the design process, the construction results, and how those results relate to the design assumptions.

A suggested outline for the report is attached to this document. You may also refer to Chapters 10–13 of the textbook and/or the **C.R.A.W.LAB** Style Guide, found at:

http://shared.crawlab.org/CRAWLAB_StyleGuide.pdf

Formatting requirements, a report template, including a LaTeX source file, and a video covering technical writing can also be found on the class website.

Suggested Outline

Title Page

Abstract – Standalone summary of the report's contents, on a separate page

I. Introduction
- Introduce the problem and its challenges
- End with a "roadmap" sentence outlining what is in the remainder of the report

II. Design
- Introduce the tower design
  - Use computer-generated sketches to support your description
  - Label key parts in the sketches, matching labels to the text description
  - Provide dimensions to give the scale of the structure and its key components
  - Do *not* use only pictures. You may include pictures, but they should supplement your figures, *not* replace them
- Explain any assumptions made during the design process

III. Construction Analysis & Results
- Present the results of the tower construction
- Discuss the "accuracy" of the build. Were your instructions sufficient?
- Discuss how the two points above are related to the assumptions you made during the design process. What assumptions were correct? Which were incorrect?

IV. Conclusions
- Summarize what was presented in the report
- *No* new information is presented here