



Theta Tau Zeta Delta

Coed Professional Engineering Fraternity
Engineering Leaders for Service, Profession, and Brotherhood
Since 1904

2019 Pumpkin Chunkin' Information

Event Date: Saturday, Oct. 26th, 2019

Event Location: Greene Street Field

*****Please make sure all participants sign a waiver and pay close attention to the safety and firing requirements.*****

This year's competition will contain similar size constraints as previous competitions, as well as scoring. However, this year we have a new engineering challenge for all competitors- the trebuchet must be able to be entirely assembled and disassembled on site, without the use of power tools (hand tools only) and **within the hour setup time**. Design, construction, and preparation before the day of the competition is allowed to be done with the use of power tools. We believe that including this will challenge the teams and provide the opportunity to get creative with problem solving.

Trebuchet Requirements:

- Without the arm, the trebuchet should measure no more than 3 feet wide x 4 feet long x 5 feet tall.
- The counterweight can be a maximum of 100 lbs. Different counterweight weights can be used for the distance and accuracy portions if desired, but neither can exceed 100 lbs.
- During the scored rounds, 2 lb water balls will be launched.
- There will be a bonus round for launching small pumpkins
- Since complete assembly is required on site, take extra precautions in design to ensure the safety of competitors and bystanders.
 - Part of the timed assembly is the safe dry-firing of the machine.

Safety and Firing

- The trebuchet is required to have a safety that can be disengaged from behind the firing line 10 feet away.
- The trebuchet must also be fired from 10 feet away.
- Since complete assembly is required on site, take extra precautions in design to ensure the safety of competitors and bystanders.
 - Part of the timed assembly is the safe dry-firing of the machine.



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Scoring

- **Distance (40%):** The furthest launch of the distance competition will be awarded the full 25% of points. All other launch distances will be scored as compared to the furthest launch. For example, if the furthest launch is 45 yards, that team will be awarded the full 25%, and a team with a launch of 37 yards will be awarded 37% $[(37/45)*(40\%)]$.
- **Accuracy (40%):** A target will be placed 50 yards directly in front of the trebuchet and points will be awarded based on the proximity of pumpkin ball landing to the target. One point will be deducted for each yard beyond the target.
- **Presentation (20%):** A team of judges including USC Engineering students and professors will ask students from each team questions regarding their design/construction. Points will be awarded based on the students' understanding of and rationale behind their designs.

Prizes

- The awards ceremony will be held at the end of the event
- Trophies will be awarded to the top two teams
- The team with the fastest assembly time will also be given a trophy



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Information for Scoring/Measurement

There will be three total launches. Each team will have a group of scorers/measurers that will mark and record their distances. Each launch is comprised of one practice throw and two official throws. Only the official throw with the most accurate or farthest launch will be recorded for points.

Prior to competition:

- Student groups will aid in judging with faculty based on rubric
- It is encouraged to keep a neat and detailed Engineering Notebook following the design, construction, and testing of the machine

Group of scorers/measurers:

- Watch where the ball hits and mark it
- Measure and record distance on sheet
- Give sheet to person at the scoreboard

Scoreboarder:

- Record scores of judging and launches on white scoreboard

Launches:

1. Accuracy: to the 50 yard line

- Measure distance from 50 yd line, each yard off is minus one point

2. Distance:

- Longest distance of 2 tries is recorded

3. Pumpkins:

- Place tarps where the pumpkins “should” land



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Score Sheet:

Team Name: _____ Advisor Name: _____ Date: _____

School: _____

| | Accuracy Challenge | Points (Max 25) |
|----------------------|--------------------|-----------------|
| Distance From Target | 50 Yards | |
| Practice 1 | | |
| Official Throw 1* | | |
| Official Throw 2* | | |

| | Distance | Points/Percentage (Max 25) |
|-------------------|----------|----------------------------|
| Practice 1 | | |
| Official Throw 1* | | |
| Official Throw 2* | | |

*Best official throw counts

| Engineering Process Evaluation (Max 50 Points) | | | | |
|--|--|---|--|---|
| | 15 pt. | 10 pt. | 5 pt. | 0 pt. |
| Mobility | | Machine was fully capable of being assembled and disassembled without power tools | Machine was only partially assembled on site (with or without power tools) | No assembly was required |
| Creativity | | Have a uniform theme or building design that was incorporated throughout the trebuchet | Only put effort and design details into certain parts of the trebuchet | Same design from last year |
| Understanding | All team members have a complete understanding of what went into making the trebuchet and why they designed it the way they did. | Has understanding about the build of the trebuchet but lacks understanding of the reasoning behind the design | Only able to answer the most basic questions about the trebuchet | Did not understand the way the trebuchet works when asked |
| Teamwork/ Safety | At competition, the team works together and gives equal opportunity to all of its members. Machine safe. | The team has a few people who aren't participating or contributing. Machine safe | Only have one or two members contributing to the machine. Machine safe | No teamwork/collaboration between students or the mentor is doing the launching. Machine unsafe |
| Total: | | | | |



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Details:

- All teams should report to the fields on the morning of the 26th at 10:30.
- They will be given an hour to set up their trebuchet- this will be timed, fastest setup with safe function will be awarded.
- A lunch of pizza and water will be provided to the team members at 11:30, and the students will be given the opportunity to walk through the Fall Into Science activities.
- A practice round will begin at 1:00, and the actual competition will begin at 1:20.
- The winners will be announced around 2:00.
- All teams will be assigned a college mentor who will guide them through the competition on Oct. 26.

Please send a final list of all students participating by October 18.