

## Survey Competition

### Overview

The purpose of this competition is to test each engineer's ability to analyze a landscape quickly and accurately. This skill is heavily used in the professional world, whether it be analyzing pre-construction conditions or combating a problem during construction. Basic surveying skills are essential tools that every civil engineer should possess. The surveying team will be asked to determine the distance and elevation from one location to a specified point.

### Eligibility

One team from each university may compete. A team will consist of up to three (3) undergraduate students.

### Materials and Limitations

All of the following items may be used to determine the elevation of the unknown point:

- Engineering scale or ruler
- 100 foot tape (one)
- Plumb bob
- Level
- Tripod
- Philadelphia rod

Only the following items may be used to determine the pace distance:

- FE approved calculator
- Field book
- Pencils and erasers
- Clipboard



## Execution

The team will begin the competition by checking in with the starting judge. The team will be asked to eyeball the distance from a marked starting point to a provided marker, pace out a given distance from a marked starting point to a provided marker, and, tape a given distance from a marked starting point to a provided marker. No materials are allowed during this phase of the competition except: pencils, paper, clipboard, field book, and a calculator. Only three (3) passes are allowed to determine the distance. The three passes may be distributed among the group however they see fit. Once the final placement of the provided marker has been completed the team will check-in with judge two. For part two, the team will be asked to determine the elevation of a specified point by eyeballing the elevation and by using a tripod and rod. The team will be provided a location with a known elevation and will have 30 minutes to determine the elevation of the unknown point and turn in their surveying notes. For part 3 of the will be asked to eyeball the distance form a marked starting point to a water buoy. The surveying notes should contain information commonly found in a surveying field book along with any and all calculations. No team or team member may leave the land of the park.

## Judging

Judging will be performed by the head judges. Additional judges may be selected to ensure that all judging is fair and consistent throughout the competition. There will be a minimum of three (3) judges for the competition, and at least two (2) judges will preside over the competition at all times.

## Scoring

Scoring will be based on the accuracy of the estimated distance and elevation compared to the actual distance and elevation from the starting location to a specified point. For each circuit the team will start out with 10 points 1 point will be deducted if the team's value is  $\pm 2\%$ , 3 points if  $\pm 5\%$ , and 5 points if  $\pm 7\%$ . The team with the highest total points from the competition will be the winners.



## Disqualifications

All electronic devices excluding approved materials are prohibited. These items include but are not limited to electronic distance measurement instruments (EDM), GPS devices, and cell phones. Any team using an unapproved device during the competition will be disqualified.

Teams that exceed the allowed number of passes for the pacing challenge will be disqualified.

Teams who do not supply the data and/or calculations used to determine the elevation of the specified point will be disqualified.

Any team receiving guidance from a non-team member or leaving the land of the park during their turn will be disqualified.

