



Surveying

Surveying Competition

Pacific Southwest Conference 2018

1.0 Objective

The surveying competition serves to evaluate each team member's knowledge and understanding of land surveying equipment and techniques, as well as basic trigonometry in a timed setting.

2.0 Participant Rules

- Each University may enter only one team.
- Teams must consist of 4 members.
- Everyone on the team must be a registered participant of PSWC 2018.
- The team must have at least one underclassman.
- The team must have at least one female.

3.0 Event Description

There will be three main surveying tasks to be performed by each team. In the first of the three tasks, students must use their skills in land surveying and knowledge of basic trigonometry to determine the bearing and distance between two points and the elevations of each point with respect to the provided backsight. In the second task, teams will have to determine the elevation of a remote building, or other fixed object, through the use of a provided benchmark and their knowledge of trigonometry. The third task will consist of steel tape measurement over a varying terrain. Additionally, teams have the option to attempt to earn extra points through a timed instrument setup competition. All three tasks need to be completed within a 45-minute block, including the extra credit event if the participating team desires to complete it.

4.0 General Rules and Tasks

4.1 Bearing, Distance, and Elevation:

Using a total station, the team of four will need to determine the distance between two points, A and B, the elevation of each of the points, A and B, and the bearing of line AB. The team must first determine the location of each of the two points using given approximate bearings and approximate distances from a fixed backsight point. A benchmark will be provided. Each team will be allotted a total of 20 minutes to complete this task. The total time required for this task to be completed will influence the team's placement in the event of a tie (Refer to "Scoring" Section).

4.2 Remote Elevation:

Teams are required to determine the elevation of a building or other fixed object from a remote location. A benchmark will be provided. A singular point observation is allowed. Total stations are permitted with the exception of reflectorless models.

4.3 Steel Tape Measuring:

The team of 4 will use a measuring tape no longer than 100 feet to measure the distance between two points over a varying terrain.

4.4 Instrument setup (extra points competition):

From every team, 1 member may participate. Participant will be timed on how fast he/she can set up a tripod. All 3 legs of the tripod must be retracted in the shortest position and locked inside a bag prior to the start. Timing will begin once the judge signals the start. The participant must level the theodolite and tripod correctly over a given point. All teams will use the same theodolite provided at the start. The 3 teams with the best time will receive extra points according to the scoring below.

5.0 Instruments Allowed

The following equipment and instruments are allowed:

- Total Station (no reflectorless models)
- Tripod
- Level rod
- Measuring tape (no longer than 100 feet)
- Pocket tape
- Plumbobs (Maximum 2)
- Non-programmable calculator (EIT qualifying)
- Two handheld 2-way radios
- Line Level and/or Hand Level

6.0 Scoring

Every task will be scored based on accuracy, field book neatness and presentation. In case of a tie in the overall score among teams, the tie will be broken in consideration of the amount of time each team took to complete the “Bearing, Distance, and Elevation” task.

6.1 Bearing, Distance, Elevation:

- Accuracy:
 - First Place: 50 Points
 - Second Place: 40 Points
 - Third Place: 30 Points
 - Fourth Place: 20 Points
 - Fifth Place :10 Points
 - Participation: 5 Points

- Field Book:
 - First Place: 25 Points
 - Second Place: 20 Points
 - Third Place: 15 Points
 - Fourth Place: 10 Points
 - Fifth Place: 5 Points

6.2 Remote Elevation:

- Accuracy:
 - First Place: 50 Points
 - Second Place: 40 Points
 - Third Place: 30 Points
 - Fourth Place: 20 Points
 - Fifth Place :10 Points
 - Participation: 5 Points

- Field Book:
 - First Place: 25 Points
 - Second Place: 20 Points
 - Third Place: 15 Points
 - Fourth Place: 10 Points
 - Fifth Place: 5 Points

6.3 Steel Tape Measurement:

- Accuracy:
 - First Place: 50 Points
 - Second Place: 40 Points
 - Third Place: 30 Points
 - Fourth Place: 20 Points
 - Fifth Place :10 Points
 - Participation: 5 Points

- Field Book:
 - First Place: 25 Points
 - Second Place: 20 Points
 - Third Place: 15 Points
 - Fourth Place: 10 Points
 - Fifth Place: 5 Points

6.4 Instrument Setup (extra points):

The three teams with the fastest instrument setup times will receive extra points as follows:

- First Place: 15 points
- Second Place: 10 points
- Third Place: 5 points