How to Succeed in CEE Measurements Labs

Description

CEE 2814 is a 4-credit course under the department of Civil and Environmental Engineering. This course consists of lecture and seven measurement labs. Measurements lab stresses the importance of surveying in the department of Civil and Environmental engineering and help undergraduate students get familiar with the measurement equipment will be used in their future careers. A higher lab report grade will help student get a higher CEE 2814 course grade. Although CEE Measurements is a sophomore class required for all CEE undergraduate students, the measurements lab is not an easy general civil engineering class. In order to succeed in CEE measurements labs, students have to follow several rules and requirements to accomplish each lab. Additionally, Measurements lab is different with labs in other majors, all the labs have to be performed outside of the classroom. Because of this special requirement, the weather and other environmental conditions also affect the data and the results.

CEECL is the CEE Measurements lab's classroom located on the end of the third floor of Patton Hall. This is a computer laboratory which was designed for CEE students to finish their AutoCAD civil 3D design projects, and also designed as a computer classroom for the department of civil engineering. It is necessary to arrive at CEECL earlier before each Measurements lab starts.

The Measurements lab contains three parts: finishing the pre-lab quiz, understanding the principles and techniques for this lab, and performing the lab. In order to get a good grade on the quiz, students should read the lab manual carefully and pay attention to the key terminologies and numeric values illustrated in each lab manual. Students have the responsibilities to understand and go through all the procedures before they actually perform the lab. During the in-class session, students need to pay attention to TA's presentation. It is necessary to take pictures or write down the important notes of the presentation. For instance, students need to take pictures of where they start the lab and write down their starting points before they leave CEECL.

During the lab performance session, it is important to wear proper clothes and proper shoes before students go to the lab. To finish each lab students have to stand outside under any weather condition for more than two hours. Each group should bring one field book, flash drives and harder lead pencil to record all the data. Each lab requires students to use specific surveying instruments to finish the

measurements. All the labs are performing on the field near Duck pond, from Solitude, the oldest architecture on campus to the other end of the bike path.

Students have to read through the procedure to set up the equipment on the top of the tripod and follow the steps to input the initial value before the group starts measuring elevations of each station. The major equipment which used for Measurements lab is total station which helps the student to collect the elevation of different points on the field.

After finishing the lab, the group should set up a time and meet up to finish writing the lab report. All the numeric calculation should be written on engineering paper and using excel to calculate it. Great team work is the key to finish the lab report, and AutoCAD civil 3d design project or topography graphs on time.

In general, CEE 2814 Measurements lab helps undergraduate students in the major of civil engineering to understand the general procedure of surveying and get used to the major surveying instruments. The Measurements lab also provide an opportunity for students to improve their communication skills and technical writing skills. Overall, this course is one of the most important undergraduate classes in the department of Civil and Environmental engineering.

Instruction

The step-by-step below illustrates the general procedures of a Measurements lab. Each lab provides a specific task of surveying and helps students get familiar with the surveying instruments and measurement procedures. Total station instrument is the major equipment for each lab, and students also need other measurement supplement: philadelphia rod, tapeline and tripods. It is necessary for students to wear proper clothes because of the special environmental conditions in Blacksburg. During each lab, each group needs to record the data carefully and efficiently. The step-by-step instructions are displayed below:

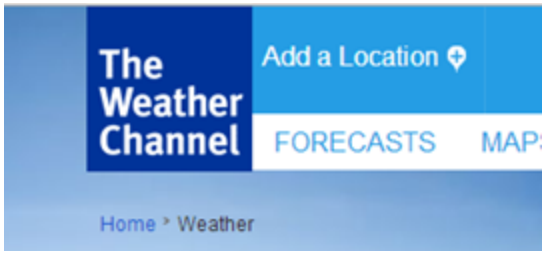
Step 1: Read the lab manual carefully before each lab starts.

Step 2: Make sure you bring a flash drive and field book and lab manual to each lab.

Field Book

source:http://www.engineersupply.com/Images/Elan-Surveying-Mining-Cross-Section-Field-Books/ES1634-Elan-Casebound-Field-Book-E64-8x4-md.jpg

Step 3: Check the weather of the lab day, and wear proper clothes and shoes before you go to each lab.



The Weather Channel

source: http://www.weather.com/forecast/

Step 4: Enter CEECL five to ten minutes earlier before the lab start.

Step 5: Finish the quiz for each lab, and listen to the TA's instruction of the lab. Get the key of the locker for your group.

Step 6: Go to the Patton Hall basement. Using the key to open the locker and bring all the required instruments to the field.

Source: Picture from Zihan Wang.

Step 7: Perform the lab. Adjust the TSI to correct elevation before start the lab.

Source: Picture from Zihan Wang

Step 8: Write down the date, today's weather and the name of the lab on the field book.

Step 9: Return the surveying instrument and return the locker key to the lab TA.

Step 10: Meet with the group, wrap up the data collected and finish the lab report.

Step 11: Turn in the lab report into the mailbox on the right side of the locker in Patton Hall basement.

Source: Picture from Zihan Wang.

Important Notes

1. Bring a flash drive, field book and a harder lead pencil.
2. Wear proper clothes and be prepared to stand outside for three hours.
3. Take care of the locker key, and turn it to the lab TA after the lab be finished.
4. CEECL is a designated workroom opened from 7:45 AM until 9:55 PM during the week.
5. Save all your files in your flash drive, do not save it on CEECL computers.
6. Great and Efficient team work is really important for each lab's success.

The instructions of the lab help students understand the general procedure of Measurements lab, and have a general idea of how to accomplish each lab before students actually take the lab. The lab TA helps the group solve any technical and academic problems of each lab. If the collected data is missing or the instrument has trouble to record the lab data, the group should contact the lab TA for a make-up lab and find another day to retake the lab. Overall, students improve their surveying skills and build up a great collaboration skills by taking each Measurements lab.

Glossary

AutoCAD Civil 3D:	The building information modeling solution for civil engineering, helps project teams deliver higher-quality civil engineering design projects faster. This software is installed in CEECL lab for students to use.
CEECL:	Civil & Environmental Engineering Computer Laboratory. CEECL is located on the end of Patton Hall third floor, room 319. Students are required to meet inside CEECL prior each lab session. No food or drink are allowed in CEECL laboratory.
Engineering Pape:	The green engineering paper consists of two side, one side with the grid and the other side does not have grid on it. The green engineering paper can be purchased at university bookstores or on-line.
Field Book:	Field book shall be complete with 2H or harder lead (if smudging occurs then use harder lead). Field book is required one for each group and field data is recorded directly in the field book. source:https://scholar.vt.edu/access/content/group/e055926b-02ab-4ace-bad2-ab82e7dd4015/Homework_and_Lab_Report_Format.pdf
Solitude:	Solitude is the oldest structure still standing on campus, and it is located near the Duck pond. Solitude will be used at a station point during some measurements labs. source: http://www.vt.edu/about/buildings/Solitude.html

Surveying: The major technique used in Measurements labs. Surveying accurately determining the terrestrial or three- dimensional position of points and the distance and angles between them.
source: http://en.wikipedia.org/wiki/Topography

Tripods: The equipment which support the surveying instrument. The height of the tripods can be changed by adjusting the feet of the tripods.

Topography: The study of surface shape and features of the earth and other observable.Students need to collect the data of the elevation of entire field near Duck pond and complete a topography map for the field.

Total Station: The instrument which will be used to measure the elevation of the specific points.