A Scavenger Hunt Activity to Welcome First-year Students to the Civil Engineering Department

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Scavenger hunts have been used by college orientation programs to serve dual purposes: informing students of the availability and locations of university resources, and providing new students an opportunity to meet and engage with each other. A scavenger hunt has been part of a homework assignment in the author's first-year Introduction to Civil Engineering course for the past four years. It was introduced to provide an opportunity for students to visit and learn about the department and to meet current students and faculty. This paper describes the motivations and goals of the scavenger hunt assignment, the format of the activity, and assessment results.

Motivation and Goals

At the author's university, all incoming students must take both a multidisciplinary Introduction to Engineering course as well as a course that introduces the student to his/her selected major. Civil engineering students are advised to take one of these courses during each semester of freshman year, so some take it during first semester and some during second semester. The course enrollment usually includes several transfer students from different universities, undeclared first-year students, and a few students in different majors, including students from the Sustainable Urban Environments degree program who are required to take this class during their first or second year,

The objectives of the Introduction to Civil Engineering course are

1. List the subdisciplines of civil engineering, identify types of projects that engage each, and understand the multidisciplinary nature of most large infrastructure projects;
2. Explain the overall role of civil engineers in design and operation of urban infrastructure, with understanding of the range of typical day-to-day tasks and responsibilities;
3. Discuss the ethical responsibilities of engineers to their profession and to the general public;
4. Use improved computational and communication skills to present technical information;
5. Use AutoCAD and ArcGIS to make engineering drawings and maps.

Another unstated objective of the course is to welcome the students to the Civil and Urban Engineering department, which will be their "home" for the next four years, and to begin to build a sense of community among the students. The author interweaves this throughout the semester by bringing in student club leaders to invite them to participate in club events, inviting the department chair and faculty members to come speak to the students in person about themselves and to provide their own advice, holding an in-class panel discussion with recent alumni, and showing a video made by the department, which specifically provides advice from outgoing seniors to incoming freshmen. The author realized that beyond the opportunity for question and answer periods, these activities are in the realm of passive learning. The scavenger hunt homework assignment grew from an interest in providing the students with an active learning method of engaging with their new home department. This has become increasingly important as the class enrollment has grown from less than 30 students to close to 50. The large lecture class

environment can be much more inhibiting to new students, and it is more difficult for the faculty member to form a sense of community among such a large group during limited class time.

At its inception during the Fall 2015 semester, the main objective of the scavenger hunt was to force the students to physically enter the part of the engineering building that houses all civil engineering faculty offices, department administration, several graduate offices and two small rooms reserved for student use, mainly upper-level students both socializing and working on assignments. Despite the fact that it is not closed off from the rest of the building, undergraduates rarely found their way to this part of the engineering building until the middle of spring semester when they needed their first one-on-one meeting with the department's academic advisor prior to registration for their third semester.

While the overarching goal was to force students to actively make their way to the department offices, the more subtle goal of engaging students with the civil engineering department was built into the activity. Students are required to talk to both a current student and a faculty member while completing the scavenger hunt. These one-on-one conversations, although forced by the activity, opened the door to students who wanted to learn how to fit into the life of the department.

Literature Review

The first-year experience for most college students is a significant departure from their experiences during their K-12 education. At both residential and commuter colleges, students are confronted by a new type of academic schedule, different support and administrative structures, and the new-found need to navigate it on their own with little parental guidance. Orientation programs at most universities have grown, specifically to help students cope with these new experiences and expectations.

Gunn [1] reports on the value of scavenger hunts at the University of Michigan. Their students have opportunities for campus-wide scavenger hunts as well as in-building College of Engineering scavenger hunts. The latter provide an opportunity for new students to feel part of their new environment, overcome isolation, and begin interacting with peers and faculty.

Grey et al [2] describe the development and implementation of a scavenger hunt for First Year Engineering Orientation. Lindsay et al [3] follow this up with an evaluation of student exit survey responses after participating in the scavenger hunt. The students believe that the scavenger hunt prepared them well for the transition to college, provided opportunities to meet new students, and developed teamwork and communication skills.

Format of the Scavenger Hunt

The scavenger hunt is assigned as part of a weekly homework assignment. Students are required to print out a several-page document and fill in the blanks by hand while walking along a

proscribed path past most department offices and ancillary rooms. They submit the completed pages one week later for grading, typically earning two points for each correct answer.

While walking the route of the scavenger hunt, students are asked to write down room numbers for specific professors and labs, titles and authors of books on display, counts of displayed trophies won in competitive club events, and similar other departmental trivia. They are also required to introduce themselves to a student and a faculty member, ask specific questions, and report those answers on the scavenger hunt document. The instructor always sends an email to the department faculty when the scavenger hunt is assigned. This email encourages the faculty to welcome the freshmen they see roaming around, and reminds faculty that the students will seek some of them out to answer questions.

More recent versions of the scavenger hunt also direct the students to department computers at which they are instructed to look up certain information at the department website, including department-sponsored events.

The department offices are currently relocated to a different building due to facility upgrades. Although the building is only across an outdoor plaza from the main engineering building, this new location is a high-rise commercial building, with the civil engineering department occupying the sixth floor as the only tenants from the university. This made the scavenger hunt even more relevant because no classes are held in this temporary location; first-year students will typically have no need to visit this building so they will not chance upon the department offices. Fortunately this temporary space is large enough to include student lounge and study space, as well as a small computer cluster for our department. The newest version of the scavenger hunt which brings students to this temporary department location explicitly encourages students to consider working in these spaces when they are not in class. This encouragement appears to have worked, because last semester the instructor observed quite a few students from the class using the computer lab during the latter half of the term. This had not been the case when two computers were made available in the student study room during prior semesters in the engineering building.

The most recent survey used in Spring 2019 is attached as Appendix A. Although the general format of the scavenger hunt has not changed, it has evolved to be more instructional, providing information and guidance about use of departmental facilities (faculty mailboxes, copy machine, etc.) rather than just asking students to find answers and fill in blanks.

Scavenger Hunt Assessment

The scavenger hunt activity has generally been well-received. Faculty members have reported that they are glad to meet the new students, continuing students enjoy reminiscing about doing the scavenger hunt themselves while meeting new students, and the enrolled first-year students are glad to have an easy activity to do for homework. Brief in-class discussions each semester after the activity is completed reveal that students appreciate the effort to see the department offices, many for the first time. As noted by Gunn [1], requiring students to do this as part of an assignment gives students who are naturally curious, but are also possibly intimidated to go to

the department, a good "excuse" to visit and start becoming members of the department community.

Five groups of students who did the scavenger hunt while enrolled in the course during past semesters were recently surveyed about their experiences via an online poll. The survey questions, shown in Table 1, used 5-point Likert-scale questions to assess the degree to which the scavenger hunt achieved its stated goals, as well as the efficacy of several specific parts of the scavenger hunt. Students were explicitly asked whether the scavenger hunt made them feel more welcome in the department, and were also asked to assess the usefulness of the scavenger hunt - reporting their recollection of how valuable they perceived the activity when they were doing it and also the value they assign to it retrospectively, after one to six semesters have passed. Responses for Q1 ranged from "5 Goal definitely accomplished" to "1 Goal not accomplished at all." Responses to Q2, Q6 and Q7 ranged from "Extremely Useful" to "Not at all useful".

Table 1: Survey questions used to assess the scavenger hunt

Q1 How well did the scavenger hunt accomplish each of the following GOALS?
I found out where CUE offices are located
I met a few current students
I learned about a few clubs
I talked to a CUE professor
I felt welcome in the CUE department
Q2 How useful was each of the following parts of the scavenger hunt for learning about civil engineering at NYU Tandon?
Determining the subdiscipline represented on each video monitor
Looking at club trophies, awards, and information posters
Talking to students in the lounge
Talking to a professor in his/her office
Q3 Had you ever been to the CUE offices before the scavenger hunt?
If yes: Q3a Even though you had been in the department offices before, did the scavenger hunt make you feel more welcome in the department?
If no: Q3b Did visiting the CUE offices for the scavenger hunt make you feel more welcome in the department?
Q4 At the time you took the scavenger hunt, how useful did it seem?
Q5 In retrospect now, how useful was the scavenger hunt?

The survey was emailed to a total of 190 students; 77 surveys were completed in full and three were partially complete when submitted. Figures 1 and 2 show the breakdown of student enrollment in each of the five sampled semesters and complete responses received from each. Response rate ranged from 37 to 47 percent, which is deemed acceptable. Due to the small sample sizes for two classes and the fact that the general format of the scavenger hunt did not vary much from semester to semester, even with the relocation of the department offices, most survey results presented below are based on a combination of all class results.

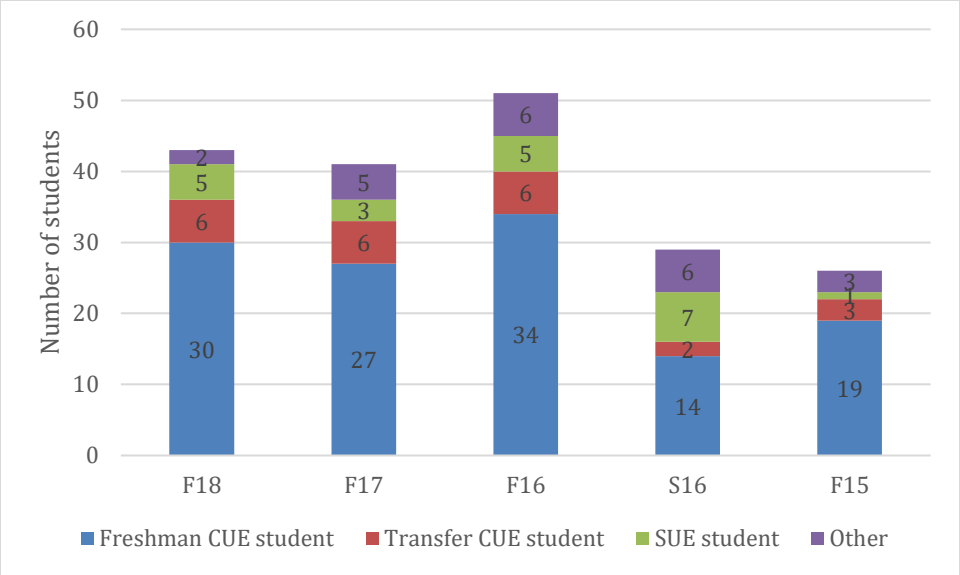

Figure 1: Distribution of students enrolled during the surveyed semesters

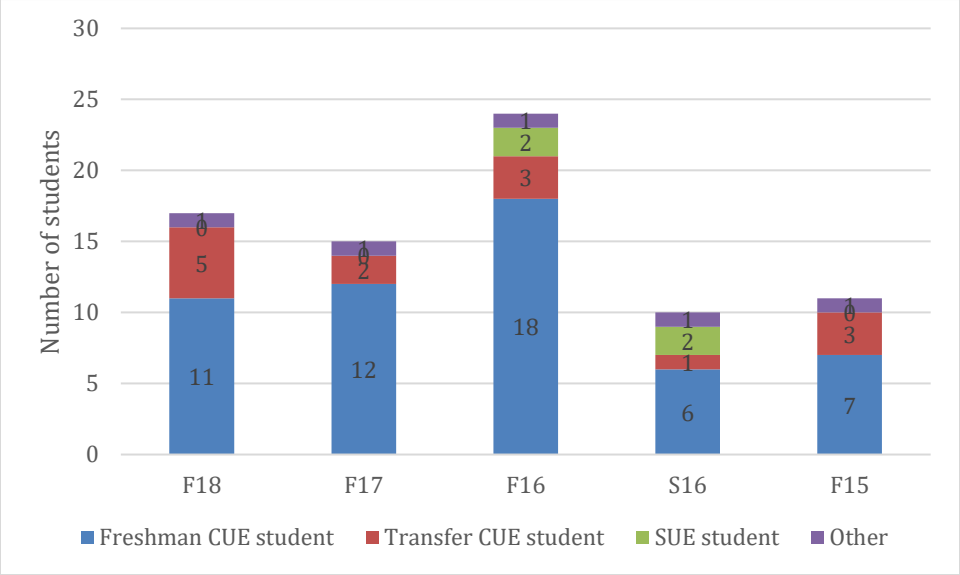

Figure 2: Distribution of students who replied to survey

Figure 3 shows student responses to question Q1, indicating the extent to which the scavenger hunt achieved each of the stated goals. All bars are scaled to the same height; the number written in each bar indicates the number of students who selected that option. The goals that students were most unanimous about achieving were related to the physical requirements of the scavenger hunt: they needed to find the department offices to complete the scavenger hunt and to speak with a professor as one of the activities. The students' responses also indicated a strong sense of welcome in the department; 86 percent of respondents selected 4 or 5 as the degree to which that goal was achieved. The larger numbers of students who reported only moderate success by selecting option 3 on the Likert scale for the remaining goals (meeting current students and

learning about clubs) may be a result of the verbs used in these questions. Although students were required to talk to a current student, perhaps they did not feel that they "met" the student; similarly, although the students were asked to write down names of clubs and other trivia about the clubs, they did not perceive this activity as leading them to learn about the clubs.

The results in Figure 4, which indicates the students' reported usefulness of several activities in the survey, agree with the interpretation of the results in Figure 3. Using the number of combined responses 4 and 5 as the metric, students deemed talking to professors and looking at images about each of the subdisciplines of civil engineering more useful for introducing them to the department. They reported less overall usefulness for the activities of talking to current students and gathering information about clubs.

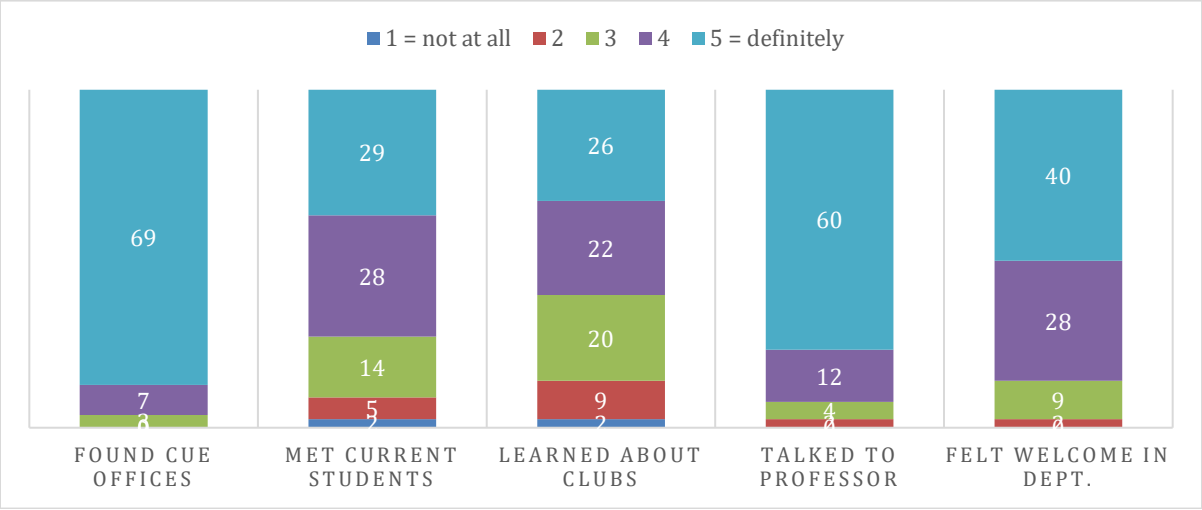

Figure 3: Student responses to Q1. How well the scavenger hunt achieved the stated goals.

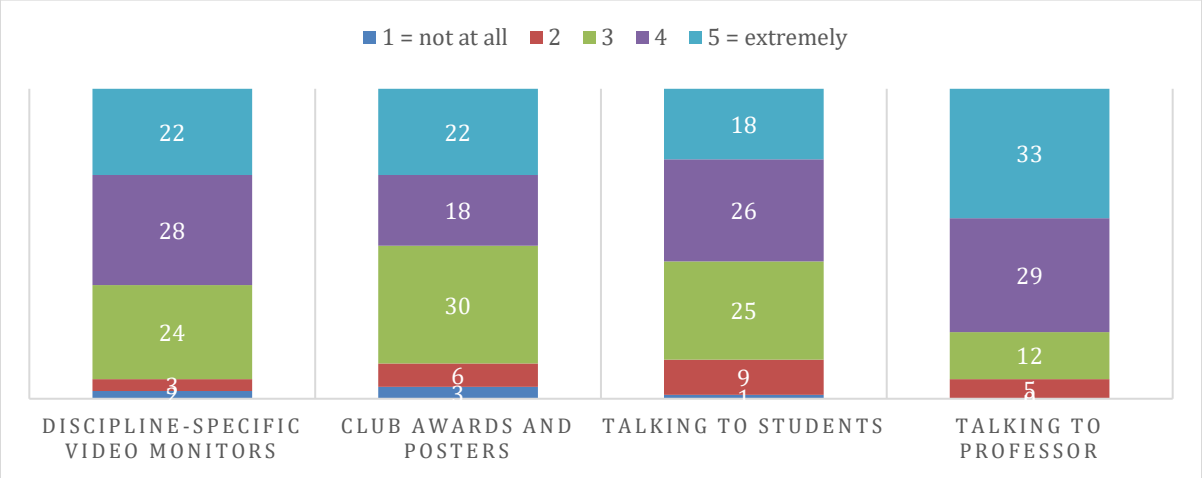

Figure 4: Student responses to Q2. How useful different activities were.

Of the students who responded to this survey, a surprising 31 percent had already visited the civil engineering department offices in the past. The survey did not ask what brought them to the department, but the likely reason is that students visited either during open house or student orientation. The largest percentage of prior visits was reported by the most recent class (44%). Unlike the fifth part of Q1, the only permitted responses to Q3a and Q3b were yes and no. Of the students who had not previously visited the department, 93 percent reported that the scavenger hunt made them feel welcome in the department. A slightly lower number, 84%, of the students who had previously visited indicated feeling more welcome by this scavenger hunt visit.

The most surprising result of the survey is the comparison of responses to Q6 and Q7. Many students reported that their current perception of the scavenger hunt ("in retrospect") is that it is more worthwhile than they perceived it when they were first-year students completing it as a homework assignment. Figure 5 shows student responses to these two questions. While they were students enrolled in the class, the value of the activity was not recognized; however, in later semesters they grew to value the activity.

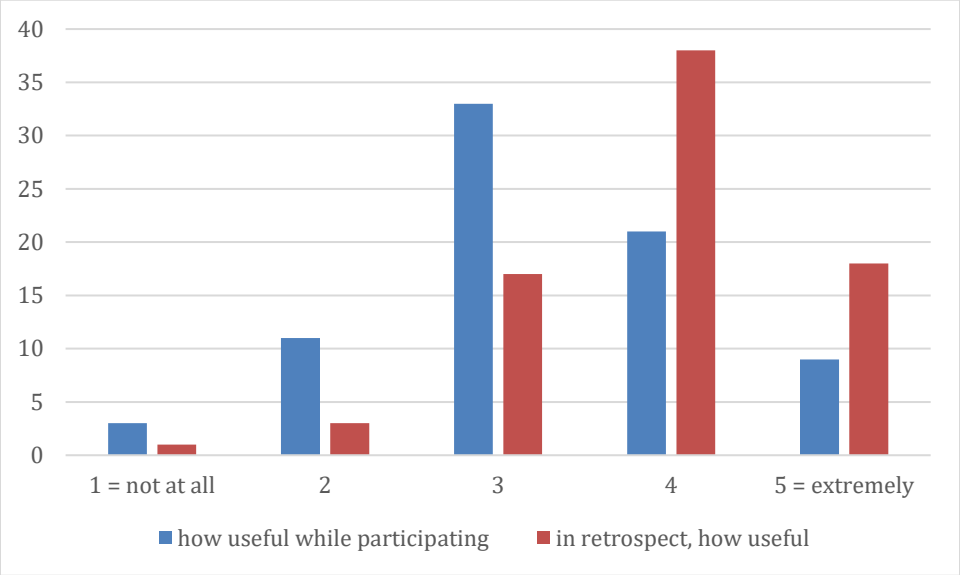

Figure 5: Comparison of how useful students perceive the scavenger hunt both during the semester when enrolled in the class, and retroactively.

The mean response for question Q6 (usefulness while participating) was 3.3 and the mean response for Q7 (retrospective usefulness) was 3.9. The average difference between Q6 and Q7 replies was 0.6, indicating that students reported higher usefulness in retrospect. Since the same set of students answered both questions, a paired sample t-test was performed to assess the null hypothesis that the mean difference is 0. The t-test result confirmed that the difference between Q6 and Q7 responses is significant at the 95% level.

Students were also asked to provide open-ended comments about the value of the scavenger hunt; 24 students chose to do so. The feedback was overwhelmingly positive. Sample responses are below:

Fall 2018 student: “Scavenger hunt was amazing and well thought out. It would have been better if there was a way to include meet[ing] new CUE students in the current grade. Otherwise was fun and helpful.”

Fall 2017 student: “Met some of my best friends on the scavenger hunt. Even though offices moved, I met a few professors that I have had or will have. Overall, good experience!”

Spring 2016 student: “It provided an opportunity to learn and be a part of the department community. Everyone who’s been around knows of the scavenger hunt and are extremely friendly and helpful, willing to spend time to talk with me. As a new comer, this event served an important introduction to what our cue department has to offer.”

Fall 2015 non-CE student: “Surprisingly useful. Almost wanted to switch major.”

Conclusions

The scavenger hunt activity which is part of a homework assignment in the Introduction to Civil Engineering course has been well received by students and faculty. It achieves its goals of having first-year students visit and learn about the department and meeting current students and faculty. Most important, it provides the first-year students with a sense of welcome in the department. Students perceive this as a valuable activity.

References

[1] C. Gunn, “The value of scavenger hunts in the life of a freshman,” in *Proceedings of the 2008 ASEE Annual Conference & Exposition*, Paper AC 2008-2912, Pittsburgh, PA: American Society for Engineering Education, June 2008.

[2] S. Gray, E. Lindsay and J. Walraven, “ORIENTHUNT: The development of a scavenger hunt to meet the needs of a first year engineering orientation,” in *Proceedings of the 22nd AAEE Conference, Dec 5-7 2011*, Fremantle, WA: Australasian Association for Engineering Education, 2011, pp. 543-549.

[3] E. Lindsay, S. Gray, and N. Lloyd, “Students’ Responses to a Scavenger Hunt for First Year Engineering Orientation,” *World Engineering Education Forum (WEEF) 2012: Engineering Education for Sustainable Development and Social Inclusion, Oct 15-18 2012*. Buenos Aires, Argentina, 2012.

Name _____ APPENDIX A

Date _____ Time started _____Time ended_____

CUE Scavenger Hunt

Walk over to 15 MetroTech Center. Take an elevator to the 6th Floor. This is where the CUE department is located temporarily while Rogers Hall 4th floor is being renovated.

NOTE: Throughout this scavenger hunt you will be walking in a more-or-less clockwise path around the CUE department offices guided by *directions in italics.*

Make a left after swiping your ID on the 6th floor of 15 MetroTech. Find the set of video monitors and watch the photos for a while. The photos on each monitor are intended to relate to a different CE subdiscipline. Report the subdiscipline for each monitor, in terms of the color of the banner across the bottom. (The hallway lighting makes the colors difficult to see; the monitors are in the order listed below.)

Green _____

Purple _____

White _____

Orange _____

Grey _____

What is the official name of the room located between the 3rd and 4th monitors? (Report the long name on the large plaque, not the short name by the room number.) **NOTE: This room is open to students to study.**

_____

NOTE: The ASCE student chapter has won numerous awards for the concrete canoe and steel bridge competitions. Some of these awards are displayed in this room.

Find the three First Place awards for the 2016 ASCE Metropolitan Section Concrete Canoe Competition. What three categories did the NYU team win?

1. _____ 2. _____ 3. _____

Continue walking along the hallway past the restrooms (you are now walking east).

NOTE: NYU has other student clubs related to various subdisciplines of Civil Engineering. NYWEA and the ITE are two such clubs.

What does NYWEA stand for? _____

What does ITE stand for?_____

Continue east to the end of the hallway and make a right. Follow the sign in the direction of the Building Informatics Lab.

NOTE: Professors' offices are located in the clusters of interior rooms with glass sliding doors.

What is Professor Lawrence Chiarelli's office room number? _____

NOTE: The southeast corner of the 6th floor, behind the curved wall, is an eating area that is often used by students to study.

How many tall stools are located along the counter in this area? _____

Walk west along the hallway from this corner, keeping the windows to your left.

NOTE: The tripod is holding is an old surveying instrument.

Look to your right to find three more bulletin boards advertising student chapters of CMAA, Chi Epsilon, and ASCE.

Which competition do CMAA students participate in? _____

What is Chi Epsilon? _____

NOTE: The books displayed in the case to the left of these club bulletin boards were written by present and past faculty. Write down the name and author of one of these books.

_____

Continue walking west along this hallway to the CUE Computer Lab located in room 6E-08. **NOTE: The computers located in this room are configured with the same settings and programs as the computers in RH 217 and are provided for student use.**

Which graduating class is identified on the triangular pennant hanging in this room? _____

Log into one of the available computers and search the CUE website http://engineering.nyu.edu/academics/departments/civil.

Who is the CUE Department Chair? _____

Click on the "Faculty and Staff" link to find the following professors. Click on links to their websites and find out where and when they earned their PhD degrees.

1. Prof. Semiha Ergan _____

2. Prof..Andrea Silverman _____

3. Prof. Joseph Chow _____

Exit the Computer Room and walk around this set of offices to answer the next two questions.

What is Professor Anne Ronan's office room number? _____

What is Professor Roula Maloof's office room number? _____

After finding Prof. Maloof's office, make a right and walk west along the hallway, keeping the windows on your left and passing the "Building the Times" photographs by Annie Leibovitz.

What is Professor Jose Ulerio's office room number?_____

NOTE: Two of the research centers in the CUE Department are C2SMART and InterCEP.

What does C2SMART stand for? _____

What does InterCEP stand for? _____

Go to the southwest corner of 15 MetroTech and look out the windows to see MetroTech Commons below and the Dibner Library building with the red triangle above the entrance.

What is the tan building with the red trim located directly across the Commons? _____

Turn right to start walking north and find the Charles Snow CUE Dept. Conference Room in 6W-44.
NOTE: The plaque outside this room commemorates the 50th anniversary of the founding of the Brooklyn Polytechnic Institute ASCE Student Chapter, which is now the NYU Tandon Student Chapter.

When was this plaque awarded? _____

How many years has the student chapter been in existence?_____

Now walk along the frosted glass walls.

What is Professor Magued Iskander's office room number?_____

What is the room number of the C2SMART Conference Room? _____

Turn right and walk east (back towards the Computer Lab) to find the Copy Room (Room 6W-24).

NOTE: Every professor has a mailbox in this room. Do not submit your homework here unless your professor explicitly says to do so.

Whose mailbox is to the left of Professor Ronan's? _____

NOTE: The copy machine can be used to scan your homework or papers for free. Just press Scanner, press the "manual entry" button, and enter your NYU email (@nyu.edu). Your scanned document will be emailed to you as a PDF attachment.

Visit a professor (other than Profs. Ronan and Ulerio) in his/her office or lab. The people in the cubicles are Graduate Students, please do not confuse the two.

Which professor did you meet? _____

When did he/she start teaching here?_____

What is his/her subdiscipline within civil engineering? _____

Which classes is he/she teaching this term? (names of classes, not numbers) _____

_____

Introduce yourself to a **non-freshman** **undergraduate** student in one of the designated student areas mentioned above.

Which student did you meet? (full name, correct spelling) _____

When did he/she first enroll here? _____

Which classes is he/she taking this term? (names of classes, not numbers) _____

_____

The ASCE student chapter is hoping to plan some new events this year. The club officers have requested that you suggest an event that you would like the ASCE to hold.

Extra Credit: Who is Charles A. DeBenedittis, for whom the student lounge is named?