2006-2007 Civil Engineering Assessment Report

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1. What goals or learning objectives/outcomes were assessed in AYs 2006-2007?

1. Ability to apply analytical and quantitative problem solving skills:
2. Ability to apply knowledge of mathematics, science, and engineering (formerly ABET a), with proficiency in math through differential equations, chemistry, and calculus based physics
3. Ability to use techniques, skills, and modern engineering tools necessary for engineering practice (formerly ABET k), with proficiency in five basic areas of Civil Engineering namely: environmental, geotechnical, structures, transportation, and water resources.
4. Ability to do Civil Engineering work
   a. Ability to design and conduct experiments, as well as to analyze and interpret data in two areas of Civil Engineering (formerly ABET b).
   b. Ability to design a system, component, or process to meet desired needs (formerly ABET c).
   c. Ability to function on a team contributing a fair share of work, encouraging others to participate, cooperating with team members, sharing information, and helping to reconcile personal differences among fellow team members.
   d. Ability to function on a multi-disciplinary team (formerly ABET d), including the ability to learn the vocabulary of other disciplines and to perceive the interactions between disciplines.
5. Ability to identify, formulate, and solve engineering problems (formerly ABET e), including the ability to gather, evaluate, and synthesize information, develop alternative solutions, discourage premature conclusions, synthesize knowledge from various sources, challenge the way things are normally done, and to take new information and integrate it with past knowledge.
6. Recognition of the need for, and an ability to engage in life-long learning (formerly ABET i).
7. Ability to communicate effectively (formerly ABET g), including the ability to articulate ideas clearly and concisely; prepare written materials that flow logically and which are grammatically correct, and to make presentations that are planned and delivered effectively.
8. Ability to consider the wider societal impacts of engineering projects.
10. Knowledge of contemporary issues. (formerly ABET j)
11. Ability to carry out the Civil Engineer’s responsibility towards the public, client, and employer
12. Understanding of Civil Engineering practice in areas such as procurement of work, fee bidding versus qualification based selection, how design and construction professionals interact, and the importance of professional licensing.

13. Understanding of professional and ethical responsibility for ensuring occupational and public safety and for conducting work in a professional and ethical manner. (formerly ABET f).

2. How did you assess these learning outcomes?
   a. Describe the measures you used and the information gathered. (Description, date administered, results)

   1. **Graduating Senior Surveys.** Each semester, graduating seniors are surveyed to better understand our student population, document student’s self-reported success in the EIT/FE exam, document the extent to which students feel they achieved the learning outcomes, and identify the learning outcomes in most need of improvement as evaluated by students.

   2. **Graduating Senior Exit Interviews.** Each semester, graduating seniors also participate in one-on-one exit interviews where a broader range of, albeit anecdotal, data are collected about the student’s experience in the program.

   3. **Assessment by Professional Engineers of Senior Design Project Class.** Practicing engineers act as “clients” to evaluate and assess the work completed by students in the Senior Design Project Class. Projects are evaluated for both the technical content of the project and the quality of the design presentation. Additionally, practicing engineers evaluate how well the Senior Project class meets ABET criteria for that class.

   4. **Self-Assessment by Students in Senior Design Project Class.** Students completing the senior the Senior Design Project Class evaluated how well their own work met the ABET culminating requirement.

   5. **Industry Focus Groups.** After the spring semester each academic year, the CE program invites practicing engineers and managers from local engineering firms to conduct focus groups with Cici Matuzzi. This year faculty met with geotechnical engineers from Wallace Kuhl & Associates and Kleinfelder Engineering. Minutes from these meetings were taken and are available in the Civil Engineering office.

   6. **Standardized Exams.** We have obtained the EIT/FE reports for the previous few years for our students. The Dean’s office is looking into presenting the results in an informative and summary manner.

b. As a result of these assessments what did you learn about the program’s success in helping its students achieve these learning outcomes?

   We are currently in the process of evaluating all of the end-of-year assessments for our summer faculty meeting prior to the fall semester.

   **Retention.** As a result of our assessment last year, initiatives have been initiated during the 2006-2007 academic year to address the high attrition and low freshmen graduation rates. It has been established that the freshmen retention rate is about 20%.
3. As a result of faculty reflection on these results, are there any program changes anticipated?

1. **Retention.** Faculty agreed that more interaction between faculty and incoming freshmen is necessary. Remedies have been implemented such as the new Freshman Scholarship and the summer FastTrack Math Program, to help students with math skills entering college through the MESA Engineering and Computer Science Program (MEP). We also anticipate that a college-wide Peer Coaching program will be in place next year, organized and administrated from the Dean’s Office.

a. **How will you know if these changes achieved the desired results?**

1. **Retention.** We plan to track and monitor the recipients of the freshman scholarship and the participants in the FastTrack Math program. We hope that the retention rates among these groups will be higher than the general student population.

4. Did your department engage in any other assessment activities such as the development of rubrics or course alignment?

The department started to collect writing samples from students in CE001 (Freshman Seminar). These writing samples will be compared to students in their third year in CE100 (Engineering Geology) or CE146 (Contracts and Specifications). These writing samples may also be compared with other writing samples in the fourth-year curriculum such as in CE170 (Environmental Engineering).

No other assessment activities were developed at the department level in AY 2006-2007. The development of rubrics and additional course alignment are both planned for 2007-2008 (discussed below).

5. What assessment activities are planned for the upcoming academic year?

All of the above listed assessments will continue in addition to following planned activities:

1. **Revised Course Matrix.** We plan to revise our existing course matrix that match outcomes and required courses to include: 1) the new ABET learning outcomes and 2) Bloom’s taxonomy (e.g. knowledge, comprehension, application, analysis, synthesis/evaluation) or an indication of the depth of knowledge (e.g, novice, intermediate, expert) expected by each course.

2. **Standardized Course Syllabus.** A standard course syllabus template will be developed, and faculty will be asked to standardize their course syllabi to include specific program outcomes.
These assessment activities will begin in the Summer 2007 and should be completed by Spring 2008.