MAJOR ASSESSMENT REPORT - AY2017-18
Bachelor of Science in Civil Engineering (*BSCE*)
Department of Civil & Geomatics Engineering
Lyles College of Engineering

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1. Learning (or Student) Outcomes Assessed.

The employers have high expectations for fresh engineering graduates. The employers expect these graduates to possess many skills that will allow them to perform in their organization upon hire. For civil engineering graduates one such employability skills relates to their ability to use technical knowledge and tool(s) to problem-solve.

In AY2017-18, the following five (5) learning (or student) outcomes related to technical knowledge and use of tools were assessed:

(a) An ability to apply knowledge of mathematics, science, and engineering.
(b) An ability to design and conduct experiments, as well as to analyze and interpret data.
(c) An ability to design a system, component, or process to meet desired needs with realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
(e) An ability to identify, formulate, and solve engineering problems.
(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Note that these are five (5) of the eleven (11) student outcomes [(a) through (k)] as defined the accreditation board for engineering (i.e., Accreditation Board for Engineering and Technology, ABET). ABET accreditation for civil engineering program is led by the American Society of Civil Engineers (ASCE).

The five (5) LOs (or SOs) relate closely to Civil Engineering Program's first Educational Objective: ***Technical Aptitude*** *– Be employed as engineers with the ability to use their technical knowledge, design, and problem solving skills for effective professional practice throughout their careers*.

The complete mapping of BSCE's SOs and PEOs is presented in Appendix A at the end of this report) for reference.

2. Instrument(s) Used for Assessment.

To gauge the degree of attainment of the five (5) LOs graduating senior surveys were conducted – Note the graduating senior survey is one of the assessment techniques used by the Program on a consistent basis as an indirect assessment of outcomes. A 5-point scale was used for the survey:

5-Point Scale:

5 – High degree of attainment or gain
4
3 – Moderate degree of attainment or gain
2
1 – Little or no degree of attainment or gain

Program's expectation

The results from graduating senior survey are presented below, including Fall 2017 and Spring 2018 (AY2017-18)

LOs (or SOs)	**Percent (%) of Seniors with Rating of 4 or higher*** (1 – 5 scale, with 1 being the "little gain" and 5 being "high gain")										
	Sp' 2013	Fa' 2013	Sp' 2014	Fa' 2014	Sp' 2015	Fa' 2015	Sp' 2016	Fa' 2016	Sp' 2017	Fa' 2017	Sp' 2018
(a)	81.5	95.5	84.6	90.5	86.1	94.1	95.5	96.3	81.5	78.9	96.7
(b)	76.9	81.8	80.8	57.1	80.6	76.5	95.5	88.9	76.9	84.2	86.7
(c)	73.1	72.7	73.1	85.7	66.7	76.5	95.5	70.4	73.1	84.2	86.7
(e)	84.6	86.4	84.6	95.2	97.2	88.2	100.0	92.6	84.6	73.7	93.3
(k)	69.2	81.8	84.6	85.7	83.3	76.5	81.8	81.5	69.2	84.2	90.0

* Performance target = 65% of graduating seniors surveyed will rate each SO with a rating of 4 or above

3. Finding(s) of Assessment.

Combined 49 graduating (BSCE) seniors responded to the survey. For AY2017-18 an average rating of the five (5) SOs surveyed was 85.9%, greater than 65% per program performance target or expectation. The rating for each SO survey fluctuated from one semester to another as observed, but for AY2017-18 none of the five SOs was rated below 73.7%. Based on the results, one could conclude that this (AY2017-18) group of graduating seniors attests to:

(a) have earned and was able to adequately apply knowledge of mathematics, science, and engineering.
(b) have earned and was able to adequately design and conduct experiments, including analyze and interpret data, related to civil engineering.
(c) have earned and was able to design civil engineering system, component, or process to meet desired needs considering realistic constraints such as those of economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
(e) have earned and was able to adequately identify, formulate, and solve civil engineering related problems.
(k) have gained and was able to utilize the appropriate techniques, skills, and tools for civil engineering practice.

4. Action Item(s) Per Finding(s).

Based on the above findings [see (3)], no corrective measure is needed at this time. The BSCE program will continue to assess these outcomes in the future on a regular basis to ascertain that these standards are being maintained.

5. Plan(s) of Assessment, AY2018-19.

The BSCE undergoes ABET accreditation review in October 2018, and the review is to conclude in Spring 2019. The BSCE will also undergo periodic program review (university review) in Spring 2019. With ABET review on-going, the Program intends to develop and implement a new assessment plan for AY2018-19 to AY2022-23 (i.e., 5-year plan) in Fall 2018 semester. This new plan will be presented in the new Student Outcomes Assessment Plan (SOAP), together with other applicable updates. For AY2018-19 the BSCE will continue with senior graduating survey for Fall 2018 and Spring 2019 semesters, respectively.

6. Progress Made from Previous Assessment (AY2016-17).

Not applicable, as no corrective action was taken per this assessment technique.

Appendix A - Mapping of SOs to PEOs, BSCE, CSU Fresno

Student Outcomes (or Learning Outcomes)	**Program Educational Objectives**			
	Technical Aptitude	Life-Long Development	Collaborative Spirit	Professional Advancement
(a) An ability to apply knowledge of mathematics, science, and engineering.	●			
(b) An ability to design and conduct experiments, as well as to analyze and interpret data.	●			
(c) An ability to design a system, component, or process to meet desired needs with realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	●			●
(d) An ability to function on multidisciplinary teams.			●	
(e) An ability to identify, formulate, and solve engineering problems.	●	●		●
(f) An understanding of professional and ethical responsibility.				●
(g) An ability to communicate effectively.		●	●	●
(h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.		●		●
(i) A recognition of the need for, and an ability to engage in, life-long learning.		●		
(j) A knowledge of contemporary issues.		●		
(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	●			

The success of civil engineering graduates is defined by graduates achieving the following ***Program Educational Objectives*** (***PEOs***):

- ***a.*** ***Technical Aptitude***: Be employed as engineers with the ability to use their technical knowledge, design, and problem solving skills for effective professional practice throughout their careers;
- ***b.*** ***Life-Long Development***: Exercise capabilities for life-long learning as a mean to enhance their technical and professional skills, to continuously enrich themselves and benefit the communities they are serving and beyond;
- ***c.*** ***Collaborative Spirit***: Develop interpersonal and collaborative skills that function well amongst a diverse group of professionals for a productive career; and
- ***d.*** ***Professional Advancement***: Advance and support the engineering profession through participation of professional societies, civic groups, and educational institutions; and/or establish a distinctive record of professional achievements.