Student Learning Outcomes Assessment Summary

Mechanical Engineering, BS

College of Engineering and Mines (CEM)

2016/17 – 2017/18

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1. Assessment information collected

a. Faculty Course Assessment Reports (FCAR). FCARs from 10 courses (300-level and above) were prepared by individual instructors and collected by the ABET coordinator for analyses.

b. Senior exit survey. The spring 2017 and spring 2018 surveys were collected and analyzed.

c. NCEES Fundamentals of Engineering (FE) Exam. The results for AY16-17 were collected. (AY17-18 not available yet to the department.)

d. Capstone design projects. The spring 2017 and 2018 projects reports were collected: 12 in 2017 and 15 in 2018. Summary videos for each project were uploaded were assess by the instructor and made available on the department Youtube channel.

2. Conclusions drawn from the information summarized above

a. FCAR results are based on 10 courses against 13 criteria that align with the ABET criteria. The results are on a 4-level scale EMAU (Excellent, Average, Marginal, and Unsatisfactory). The total number of head counts for the EAMU is (900, 559, 248, 201), which is equivalent to (47%, 29%, 13%, 11%). It means that average course results show 76% Excellent or Average and about10% Unsatisfactory on all assessment tools. The results were similar to those from the last assessment.

b. The average of students survey on 11 outcome questions (see the table in the next page) is 1.45 based on the 1 (agree) – 3 (disagree) scale.

c. FE exam pass rate is above the national average for both calendar years 2016 and 2017; no results are available for the 2018 exam windows at this time.

d. The importance of industry standards and codes were introduced in the capstone senior design project. Students were required to include the Standards and Codes in their capstone design project report and exercise the Standards and Codes in prototyping.

3. Curricular changes resulting from conclusions drawn above

a. Faculty members use the FCAR analysis results to identify areas that could be improved. Faculty discussion then provides possible course modifications that can address the needs. These changes are implemented at the next course offering. Subsequent FCAR results are used to assess whether the change had a positive/neutral/negative impact on the desired outcome.
b. In AY17-18, ES201 was removed from the prerequisites of ME409 (ES201, ES301) because of redundancy (ES201 is also the prerequisite of ES301) and was leading to registration issues for some students.
c. Each capstone project team was required to create a stand-alone "Standards and Codes" section in the final written project reports.
d. Design and manufacturing elective offerings were offered every year through the capstone course and other elective courses (e.g., ME4505, ME406).

4. Identify the faculty members involved in reaching the conclusions drawn above and agreeing upon the curricular changes resulting

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Chuen-Sen Lin	Rorik Peterson	Yujiang Xiang	Lei Zhang

Table: ME Senior Survey – Outcomes questions

Please put a 1, 2, 3, or N.O. beside each of the following questions if you agree, are neutral, disagree, or have no opinion.	
Question	ABET outcomes
1) Your academic program provided you with knowledge of how to apply mathematical and scientific principles to engineering problems.	a, e
2) Your academic program provided you with the techniques needed to perform both analysis and design for engineering projects.	b, c, e
3) Your academic program provided you with the skills necessary to work with others as part of a team.	d
4) Your academic program provided you with knowledge of how engineering relates to the overall issues in today's society.	h, i
5) Your academic program required you to demonstrate your skills in oral communication.	g
6) Your academic program required you to demonstrate your skills in written communication.	g
7) Your academic program required you to demonstrate your ability to communicate your ideas to engineers (technical audiences.)	g, k
8) Your academic program required you to demonstrate your ability to communicate your ideas to non-technical audiences.	g
9) Your academic program provided you with the ability to effectively use computers for communication (e.g. report writing, e-mail correspondence, web access.)	g, k
10) Your academic program provided you with the ability to effectively use modern engineering tools necessary for engineering practice.	k
11) Your academic program provided you with an appreciation of significant engineering issues in the north	l