Student Learning Outcomes Assessment Summary

**Mechanical Engineering – MS**
College of Engineering and Mines (CEM)
AY 2016/17 and AY 2017/18

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1. **Assessment information collected**
   a. Annual progress reports (through Dept. chair) and GPA.
   b. Graduate advisory committee (GAC) evaluation at the time of thesis/project defense.
   c. Post-defense Student Assessment Form (available as on-line form in department’s Google Drive)
   d. Authorship in journal manuscripts, reports, and other technical documents.

2. **Conclusions drawn from the information summarized above**
   a. All students make sufficient research progress by the end of their program, but most significant activity occurs in the last 1-2 semesters. This “back loading” of the research appears to be due to 2 factors: more course work in the early semesters, and ramp up time to become knowledgeable about the state-of-the-art in their research area. Graduate student GPA is well-above the graduate minimum of 3.0 (3.44 for the assessment period) indicating students are mastering course material well.
   b. Most GAC members report that students are technically competent at the time of graduation, but written communication skills are only “adequate”. Additionally, these skills do not appear to improve during the program. The majority of written theses and project reports require significant outside assistance, such as through the University Writing center, to meet the grammar requirements of both the College and Graduate School.
   c. Graduating students are rated moderate to high in ability to conduct independent research.
   d. Most students do not complete/submit a peer-reviewed journal article based on their research by the time of completion of the degree program.

3. **Curricular changes resulting from conclusions drawn above**
a. New students to the program will not be assigned to a faculty research advisor in their first semester instead of 2nd or 3rd in the past. The faculty advisor will take an active role in “ramping” up the student knowledge in the area beginning in the first semester.

b. Discussion within the faculty has begun about implementing more written and/or oral projects in 1 or more of the required graduate courses. However, this cannot be simply added on top of what are already “full” classes, so this change is still in progress as course content adjustments are developed and analyzed that can address this short-coming without creating excessive course requirements beyond the current 3-credit courses.

c. No changes are deemed necessary to address this conclusion.

d. Faculty discussion regarding lack of publications resulted in encouraging future theses outlines to be correlated with a target journal format early in the students’ program (e.g. year 1). It is anticipated that this may help the students more easily adapt their final thesis/report into a journal article more quickly so that it can be completed before they graduate and leave the university.

4. Identify the faculty members involved in reaching the conclusions drawn above and agreeing upon the curricular changes resulting
   a. Cheng-fu Chen
   b. Deben Das
   c. Daisy Huang
   d. Sunwoo Kim
   e. Chuen-Sen Lin
   f. Rorik Peterson
   g. Yujiang Xiang
   h. Lei Zhang
Assessment Response Data

How would you rank the student’s knowledge of core Mechanical Engineering subjects at the graduate student level?

11 responses

100%

How do you rate the student’s ability to perform independent research?

11 responses

27.3%

72.7%
How do you rate the student's ability to convey scientific/technical information in an oral format (e.g. oral defense)?

11 responses

- Excellent: 81.8%
- Acceptable: 18.2%

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How do you rate the student's ability to convey scientific/technical information in a written format (e.g. thesis/report)?

11 responses

- Excellent: 81.8%
- Acceptable: 9.1%
How many technical documents & presentations did the student's research work contribute to? This includes journal publications, reports, and conference proceedings. Please indicate percent contribution for each.

10 responses

- 1st author on the Journal of Communications in Heat Transfer
- 2 peer-reviewed journals (50%)
- 1 conference presentation (50%)
- 1 peer-reviewed journal paper (70%)
- 1 peer-reviewed journal paper (50%), 1 peer reviewed conference paper (70%), 1 conference paper (30%), 1 final project report (50%)
- 1 conference paper (50%), 1 conference presentation (50%), and 1 journal paper (50%)
- 0
- 1 conference presentation (75%)
- 1 peer-reviewed journal (20%) and 1 conference paper (50%)
- 1 peer-reviewed journal (30%) and 1 conference paper (60%)