

UNIVERSITY ASSESSMENT COMMITTEE
Feedback to Academic Departments on Assessment Activities Reported in 2011 Annual Reports
GRADUATE PROGRAMS

DEPARTMENT Mechanical Engineering **DATE** January 10, 2012
 Revised February 9, 2012
COMMITTEE MEMBER(S) CONDUCTING REVIEW Mary K. Askim-Lovseth and Krista Lynn Minnotte

1. STUDENT LEARNING GOALS

- | | | | |
|---------------------------------------|-----------------|----------------|---------------------------|
| • Were any goals referenced? | YES <u>X</u> | NO <u> </u> | QUALIFIED Y/N <u> </u> |
| • If so, were goals well articulated? | YES <u> </u> | NO <u> </u> | QUALIFIED Y/N <u>X</u> |
| • Do goals address student learning? | YES <u> </u> | NO <u> </u> | QUALIFIED Y/N <u>X</u> |

Comments:

No Assessment Plan was posted for the graduate programs in Mechanical Engineering. The Department has two graduate programs, the Master of Science program and the Master of Engineering program. The M.S. program is more research-based while the M. Eng. Program appears to be more practical in nature and focuses on preparing students for working in industry. The Annual Report referenced two student learning goals each for the programs; all were very general in nature with each having a goal in career preparation.

Assessment Plans for AY 2006-07 were posted for the graduate programs in Mechanical Engineering. The Department has two graduate programs, the Master of Science (M.S.) program (thesis and non-thesis option) and the Master of Engineering (M. Eng.) program. The M.S. program was more research-based while the M. Eng. program appeared to be more practical in nature and focused on preparing students for working in industry. Each program had two student learning goals (one product related, the other related to career preparation) with six to seven total objectives. The only distinction with the M.S. program was "a mastery of scientific research by formulating, assessing, and documenting a scientific hypothesis" (thesis option) and "a mastery of scientific investigation by researching and preparing a scholarly report on a topic related to mechanical engineering" (non-thesis option). Several of the objectives focused on actions rather than specific student learning; such as present research at a professional venue, publish a thesis, enter a quality doctoral program, gain employment in industry or government, and pass a comprehensive exam. It would be helpful for the programs if all goals and objectives were written from a student learning perspective as this would provide greater feedback into enhancing the programs.

2. ASSESSMENT METHODS

- | | | | |
|--|-----------------|----------------|---------------------------|
| Were any specific assessment methods referenced? | YES <u>X</u> | NO <u> </u> | QUALIFIED Y/N <u> </u> |
| • If so, were specifically chosen assessment methods appropriately aligned with individual goals? | YES <u>X</u> | NO <u> </u> | QUALIFIED Y/N <u> </u> |
| • Were both direct and indirect assessment methods used as components of a "multiple measures" approach? | YES <u> </u> | NO <u>X</u> | QUALIFIED Y/N <u> </u> |

Comments:

Since there was just one goal that referenced student learning (and it was all encompassing for each degree), alignment of methods with goals was automatic. Only direct assessment methods were used, final thesis/design defense or comprehensive exams.

The Assessment Plans provided forms for the Advisor, Department Chair, Committee Chair, and Committee Members for the respective programs and included completion dates, future employment or education plans, and a five-point scale (1, poor; 5, excellent) to assess demonstrated learning. The Annual Report noted "The primary method of assessment for graduate students in the M.S. program is during either their final thesis/design defense or their comprehensive examinations" (the

design project is for the M. Eng. but that program was not specifically referenced). All were direct assessment methods. The inclusion of indirect assessment would provide an added evaluation metric.

3. ASSESSMENT RESULTS

Were any assessment results reported?	YES <u>X</u>	NO ____	QUALIFIED Y/N ____
• If so, were the results clear in terms of how they specifically affirm achievement of goals?	YES ____	NO ____	QUALIFIED Y/N <u>X</u>
• If so, were the results clear in terms of how they indicate need for improvement?	YES ____	NO ____	QUALIFIED Y/N <u>X</u>
• Were the results tied to goals for student learning?	YES ____	NO ____	QUALIFIED Y/N <u>X</u>

Comments:

A cumulative score (3.7/5.0) was provided for Spring 2008 to Spring 2011 graduates. It appears to represent the planning, completing, and presenting of the project/thesis. There was no reference to rubrics or how this assessment was done. Student strengths were planning and completing, and their weakness was presenting.

4. CLOSING THE LOOP

Were any actions taken on the basis of assessment results reported?	YES ____	NO <u>X</u>	QUALIFIED Y/N ____
• If so, do curricular or other improvements/changes arising from assessment results directly address goals for student learning?	YES ____	NO ____	QUALIFIED Y/N ____

Comments:

It was noted that no curricular changes were made based on the year's assessment. The only noted comment related to the implementation in Fall 2009 of a graduate student seminar (which appeared to be an informal "brownbag" lunch session rather than a formal class) in which one graduate student at each meeting presented his/her research.

SUMMARY

Strengths

- ____ A specific plan for assessment is in place.
- ____ Student learning goals are well-articulated.
- ____ Assessment methods are clearly described.
- ____ Assessment methods are appropriately selected.
- ____ Assessment methods are well-implemented.
- ____ Direct and indirect methods are implemented.
- ____ Results are reported.
- ____ Results are tied to closing the loop.
- (Decision-making is tied to evidence.)

Areas for Improvement

- ____ No specific plan for assessment is in place.
- ____ Student learning goals are not well-articulated.
- X Assessment methods are not clearly described.
- ____ Assessment methods are not appropriately selected.
- ____ Assessment methods are not well-implemented.
- X A single type of assessment methods predominates.
- ____ No results are reported.
- X Results are not clearly tied to closing the loop.
- (Decision-making is not directly tied to evidence.)

OVERALL SUMMARY AND RECOMMENDATIONS:

The goals of each graduate program are very singular in nature—to successfully complete a thesis or design project. The other goal, to be "well prepared" is very general and does not provide much direction for a program or for assessment. A recommendation would be to reflect on what constitutes a well-prepared graduate and have student learning goals accordingly. The incorporation of indirect forms of assessment is also recommended. An Assessment Plan has not been posted for the graduate programs. If one has not been written, please make that a priority.

The goals of each graduate program are very singular in nature—to successfully complete a thesis, scholarly report, or design project. The other goal, to be "well prepared" is very general and does not provide much direction for a program or for

assessment. Concerning the latter goal, several of the objectives were also vague—knowledge beyond the Bachelor of Science degree, “breadth of knowledge,” and employment or further education. Only the communication skills objective was written with specific learning in mind. A recommendation would be to reflect on what constitutes a well-prepared graduate and have student learning goals accordingly. The incorporation of indirect forms of assessment is also recommended.

MATERIALS REVIEWED

<input checked="" type="checkbox"/> Annual report	<input checked="" type="checkbox"/> Assessment plan (as posted)
<input type="checkbox"/> Appendices (cited in annual report)	<input checked="" type="checkbox"/> Previous assessment review
<input type="checkbox"/> Other (please describe)	

Reviewer(s):	Name	<i>Mary K. Askim-Lovseth</i>	<i>Krista Lynn Minnotte</i>
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Section 1: ___?___ Section 2: ___?___ Section 3: ___?___ Section 4: ___NA___

Coding Key:

- Y = yes, this is done appropriately and well
- N = no, this is not done at all, or it is not done in relationship to student learning
- NA = no information available
- ? = action or progress is apparent; however, evidence is lacking that this is completely and appropriately done

UNIVERSITY ASSESSMENT COMMITTEE
Feedback to Academic Departments on Assessment Activities Reported in 2011 Annual Reports
UNDERGRADUATE PROGRAMS

DEPARTMENT _____ *Mechanical Engineering* _____ **DATE** _____ *January 10, 2012* _____

COMMITTEE MEMBER(S) CONDUCTING REVIEW _____ *Mary K. Askim-Lovseth and Krista Lynn Minnotte* _____

1. STUDENT LEARNING GOALS

- | | | | |
|---------------------------------------|--------------------|----------|---------------------|
| • Were any goals referenced? | YES <u>X</u> _____ | NO _____ | QUALIFIED Y/N _____ |
| • If so, were goals well articulated? | YES <u>X</u> _____ | NO _____ | QUALIFIED Y/N _____ |
| • Do goals address student learning? | YES <u>X</u> _____ | NO _____ | QUALIFIED Y/N _____ |

Comments:

The posted Assessment Plan for the Mechanical Engineering Department is dated AY 2005-06. There are five student learning objectives identified. The Annual Report noted 11 program outcomes specified by the Department's accrediting body, the Accreditation Board for Engineering and Technology (ABET). Additional outcomes required by ABET are related to "professional and ethical responsibility, lifelong learning, knowledge of contemporary issues, working with multi-disciplinary teams, and understanding the impact of engineering solutions in a global and societal context." ABET outcomes are well articulated and delineated. Those in the Assessment Plan were less so; for example, "give students a design experience..." and "provide opportunities for students to prepare for graduate school." Additionally, knowledge and technical, leadership, and communication skills were collapsed into one objective. It might be beneficial to consider having greater alignment between the goals reported in the annual report and those listed in the assessment plan. Besides the B.S. in Mechanical Engineering (ME) degree, there are two combined programs—the B.S. in ME and M.S. in ME, and the B.S. in ME and M. of Engineering in ME. No separate assessment plans or references to these degrees were noted.

In addition to the Departmental goals, please also consider UND's Institutional and Essential Studies goals for student learning (shown in alignment within parentheses) and identify which goals are similar to departmental goals.

- X 1 Communication – written or oral ("able to write and speak in various settings with a sense of purpose/audience")
- X 2 Thinking and reasoning – critical thinking (or "be intellectually curious"; analyze, synthesize, evaluate)
- X 3 Thinking and reasoning – creative thinking (or "be intellectually creative"; explore, discover, engage)
- X 4 Thinking and reasoning – quantitative reasoning ("apply empirical data...analyze graphical information")
- _____ 5 Information literacy ("be able to access and evaluate...for effective, efficient, and ethical use")
- _____ 6 Diversity ("demonstrate understanding of diversity and use that understanding...")
- X 7 Lifelong learning ("commit themselves to lifelong learning")
- _____ 8 Service/citizenship ("share responsibility both for their communities and for the world")

Comments regarding departmental goals and alignment of departmental goals with institutional and Essential Studies goals:

Goals 1, 2, and 3 are represented in the Departmental student learning objectives; goals 4 and 7 are reflected in those required by ABET.

2. ASSESSMENT METHODS

- | | | | |
|--|--------------------|-------------------|---------------------|
| Were any specific assessment methods referenced? | YES <u>X</u> _____ | NO _____ | QUALIFIED Y/N _____ |
| • If so, were specifically chosen assessment methods appropriately aligned with individual goals? | YES _____ | NO <u>X</u> _____ | QUALIFIED Y/N _____ |
| • Were both direct and indirect assessment methods used as components of a "multiple measures" approach? | YES <u>X</u> _____ | NO _____ | QUALIFIED Y/N _____ |

Comments:

Direct and indirect assessment methods were identified in the Annual Report. They included traditional coursework, the Fundamental of Engineering (FE) exam (a national licensing exam), and “responses from recent alumni and their employers,” which reflects the annual alumni survey. There was no alignment with learning objectives.

The Assessment Plan included references to five groups—engineering science group, open-ended problems group, design project group, technical paper group, and an oral presentation group—which aligned with the Department’s five student learning objectives. Each group noted respective courses for assessment. The Plan also referenced 14 instruments (eight direct and six indirect), though there was no specific identification of them or alignment with learning objectives.

3. ASSESSMENT RESULTS

Were any assessment results reported?	YES___	NO__X__	QUALIFIED Y/N ___
• If so, were the results clear in terms of how they specifically affirm achievement of goals?	YES___	NO___	QUALIFIED Y/N ___
• If so, were the results clear in terms of how they indicate need for improvement?	YES___	NO___	QUALIFIED Y/N ___
• Were the results tied to goals for student learning?	YES___	NO___	QUALIFIED Y/N ___

Comments:

No data were reported, yet it was indicated that a review was completed.

In addition to departmental goals, some assessment results may be applicable to institutional and Essential Studies goals. Indicate any goals for which the department presents findings, and, for indicated items, describe findings below. .

- _____ 1 Communication – written or oral (“able to write and speak in various settings with a sense of purpose/audience”)
- _____ 2 Thinking and reasoning – critical thinking (or “be intellectually curious”; analyze, synthesize, evaluate)
- _____ 3 Thinking and reasoning – creative thinking (or “be intellectually creative”; explore, discover, engage)
- _____ 4 Thinking and reasoning – quantitative reasoning (“apply empirical data...analyze graphical information”)
- _____ 5 Information literacy (“be able to access and evaluate...for effective, efficient, and ethical use”)
- _____ 6 Diversity (“demonstrate understanding of diversity and use that understanding...”)
- _____ 7 Lifelong learning (“commit themselves to lifelong learning”)
- _____ 8 Service/citizenship (“share responsibility both for their communities and for the world”)

Comments regarding results and the application of results to departmental, institutional and Essential Studies goals:

4. CLOSING THE LOOP

Were any actions taken on the basis of assessment results reported?	YES_____	NO__X__	QUALIFIED Y/N ___
• If so, do curricular or other improvements/ changes arising from assessment results directly address goals for student learning?	YES_____	NO___	QUALIFIED Y/N ___

Comments:

It was noted that no curricular changes were made based on the year’s assessment.

SUMMARY*Strengths*

- ☐ A specific plan for assessment is in place.
☐ Student learning goals are well-articulated.
☐ Assessment methods are clearly described.
☐ Assessment methods are appropriately selected.
☐ Assessment methods are well-implemented.
☐ Direct and indirect methods are implemented.
☐ Results are reported.
☐ Results are tied to closing the loop.
 (Decision-making is tied to evidence.)

Areas for Improvement

- ☐ No specific plan for assessment is in place.
☐ Student learning goals are not well-articulated.
☐ Assessment methods are not clearly described.
☐ Assessment methods are not appropriately selected.
☐ Assessment methods are not well-implemented.
☐ A single type of assessment methods predominates.
☒ No results are reported.
☒ Results are not clearly tied to closing the loop.
 (Decision-making is not directly tied to evidence.)

OVERALL SUMMARY AND RECOMMENDATIONS:

It appears there is more going on with assessment in the Department than what is noted in the Annual Report. Some documentation needs to be provided of the assessment that is done each semester. It is also recommended to align the assessment methods with learning objectives for tracking of student learning and identification of those methods that would provide the most useful data for each objective; this could enable a streamlining of the data collection process. There were additional outcomes identified by ABET that were not included in the Department's learning objectives (see comments in Section 1); it would be helpful to consider the compatibility of these two listings.

MATERIALS REVIEWED

- ☒ Annual report
☐ Appendices (cited in annual report)
☐ Other (please describe)
- ☒ Assessment plan (as posted)
☒ Previous assessment review

Reviewer(s):	Name	Mary K. Askim-Lovseth	Krista Lynn Minnotte
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Section 1: Y Section 2: ? Section 3: NA Section 4: NA

Coding Key:

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