

UNIVERSITY ASSESSMENT COMMITTEE
Feedback to Academic Departments on Assessment Activities Reported in _2010-11_ Annual Reports
GRADUATE PROGRAMS

DEPARTMENT Civil Engineering **DATE** February 4, 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:

The Civil Engineering Department has two graduate programs, the Master of Science (MS) and the Master of Engineering (ME). Each program has posted on the University website a Departmental Plan for Assessment of Student Learning, dated November 2005. The Annual Report referenced a “2009 draft plan” and a 2011 Graduate Program Assessment Plan (and was requested for this review). The Civil Engineering Graduate Program Review 2010 was provided. Within this document, the same goals were referenced in the Assessment Data section as were in the 2005 Plan, though the wording was different for Goals 2 and 3 in the Program Mission, Goals, and Objectives section. Since the last review of assessment activities three years ago, AY 2007-08, no changes have been made to the student learning goals as recommended. The following is an excerpt from the previous assessment review by the Assessment Committee regarding student learning goals:

*The only difference between the two programs is the final project, a research project (MS) or a design project (ME). The three goals identified for each program do not address any competency level for student learning. One relates to ‘performing’ a project, another to career preparation in the field, and the focus of the third is for students to “build on knowledge gained in their undergraduate program of study.” The subsequent objectives for each are mainly task-oriented, such as completion of credit hours, submission of a report, participation in an experience, and “communicating with engineering professionals.” A recommendation would be to place emphasis on what students should be learning as a result of completion of the program rather than what experiences each program offers. (E.g., “Students will perform a detailed research project in a specific focus area related to civil engineering” might be rewritten as “Students will be able to design a research project that answers an engineering question, to carry out that project, and to prepare a thorough and comprehensible written report.” You’ll note that the emphasis, in the rewritten version, is on what students **will have learned to do** rather than the experiences you provide for them within the program.) (Feedback to Academic Departments on Assessment Activities Reported in 2007-08 Annual Reports, p.1)*

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> </u> | NO <u> </u> | QUALIFIED Y/N <u>X</u> |
| • Were both direct and indirect assessment methods used as components of a “multiple measures” approach? | YES <u>X</u> | NO <u> </u> | QUALIFIED Y/N <u> </u> |

Comments:

For both programs, direct and indirect methods are used for assessment. These include “1) course surveys completed by students related to course learning objectives, 2) evaluations of student design reports or theses, and 3) surveys completed by program graduates approximately 1 to 4 years into their careers” (Annual Report, 2010-11).

It is noted that though a comprehensive final exam is required of all program graduates, it is not used as an assessment tool. This would be a better assessment measure rather than the self-reporting survey by students. The programs are depending on the students' perceptions of their learning in each course (on a five-point scale [1, poorly achieved; 5, well achieved]), the benchmark is 70 percent ranking of each objective either a 4 or 5). Another disadvantage is the course-specific nature of the surveys; a program should look to the end product (the student upon completion of the program) to evaluate the overall knowledge related to the comprehensiveness and integration of the courses' content. When assessing specific course content, performance on tests, projects, etc. would be suggested assessment methods; student perceptions would be complementary to this. The evaluation of Master of Engineering projects and Master of Science theses is a step in the right direction, and we encourage the further incorporation of direct measures of student learning.

3. ASSESSMENT RESULTS

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

Comments:

Results were reported, but all data were from earlier years that were compiled for the Department's Program Review in 2010 (though the Annual Report noted that "initial assessment results were submitted in June 2011"). Data from the course surveys were from between 2007 and 2009, results for the design project reports and theses were from between 2005 and 2008, and the alumni survey feedback related to 2004 and 2008.

The number of course-specific learning objectives judged by the students to have been met (70 percent benchmark) were reported (43/54). Design project reports were evaluated on five criteria and the range of scores (3.7 to 4.3) were reported for the Master of Engineering projects, and for the Master of Science theses (4 to 5). It is assumed the metric used has five levels, but that is not stated. Alumni survey responses indicated the graduates thought the quality of their educational preparation was either above average or at par with other engineers at the same level in their careers.

4. CLOSING THE LOOP

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

Comments:

Several items were noted that should be discussed by the faculty regarding improvement. These included, 1) expanding course offerings in the transportation engineering field, 2) "revising the scope or content of selected courses," 3) providing students with more resources to improve the written and visual components of reports and theses, and 4) using additional assessment methods (PE examination results, tracking of research [publications and conference proceedings] of students and alumni, and the comprehensive examination). No specific action steps were noted, but hopefully after faculty dialogue the Department will have a clear direction as to how its graduate programs can be enhanced and how additional assessment tools can provide greater insight into student learning.

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:

Though it was noted in the Annual Report that a new Graduate Program Assessment Plan (2010) had been approved, it could not be found. It appears that since the Plan was a component of the 2010 Graduate Program Review, it was thought this represented a new plan. As noted in the previous 2007-08 assessment review, the goals should be focused on student learning rather than what the students need to do to complete the program.

The inclusion of additional direct assessment methods that were noted to be under discussion by the faculty would be a great improvement, as currently indirect measures (student course surveys and graduate surveys) dominate. It might be helpful to set up a rotational schedule for each program's student learning goals in order to have some current data regarding student learning. Looking at assessment results after such a time lag puts the Department at a disadvantage when determining what action steps may be necessary to improve student learning outcomes.

MATERIALS REVIEWED

- ☒ Annual report
☐ Appendices (cited in annual report)
☒ Other (please describe)
 (Graduate Program Review, 2010)
- ☒ Assessment plan (as posted)
☒ Previous assessment review

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Section 1: __?__ Section 2: __?__ Section 3: __?__ Section 4: __?__

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 2010-2011 Annual Reports
UNDERGRADUATE PROGRAMS

DEPARTMENT Civil Engineering **DATE** February 10, 2012

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

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:

The Assessment Plan listed is from 2004 and it would benefit from being updated. It appears that the department is currently in a transitional period concerning the assessment of undergraduate student learning following the 2009 ABET site visit. The Assessment Plan and the Annual Report both list a total of eleven student learning goals. These goals are fairly well articulated and directly address student learning. However, the annual report mainly focuses on 5 educational objectives, which are not as directly connected to student learning and they are not as well articulated as the student learning goals. The connection between the student learning goals and the educational objectives is unclear to the outside reader.

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”)
 X 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:

The information communicated above pertains to the student learning goals (although there is some overlap with the educational objectives). Several of the student learning goals are directly connected to the goal of enhancing students thinking and reasoning skills (e.g. students gaining the ability to design and conduct experiments and to analyze and interpret engineering data). The goal of students gaining the ability to communicate effectively (written, verbal, graphical) is directly connected to the ES communication goal. The goal of students gaining the ability to engage in life-long learning is clearly connected to the institutional goal of lifelong learning. The goals of gaining the education necessary to understand the larger impacts of engineering solutions on larger society and gaining an understanding of ethical responsibility appear connected to the institutional goal of service/citizenship.

2. ASSESSMENT METHODS

Were any specific assessment methods referenced?	YES <u>X</u>	NO <u> </u>	QUALIFIED Y/N <u> </u>
<ul style="list-style-type: none"> If so, were specifically chosen assessment methods appropriately aligned with individual goals? 	YES <u> </u>	NO <u> </u>	QUALIFIED Y/N <u>X</u>
<ul style="list-style-type: none"> Were both direct and indirect assessment methods used as components of a “multiple measures” approach? 	YES <u>X</u>	NO <u> </u>	QUALIFIED Y/N <u> </u>

Comments:

It appears that the department is currently in the process of revising their assessment methods at least partially in response to the 2009 ABET site visit. It is unclear to the outside reader how the objectives referenced in this section connect to the previously stated student learning goals. There also appears to be a disconnect between the methods as described in the Annual Report and those listed in the assessment plan. The annual report mentions two primary methods of assessment: indirect assessment via surveys and evaluating student performance on the Professional Engineering Examination. The surveys were an alumni survey and a survey related to “students in the summer on-campus laboratories for the distance delivery (DEDP) students” which is part of the Distance Engineering Degree Program.

3. ASSESSMENT RESULTS

Were any assessment results reported?	YES <u>X</u>	NO <u> </u>	QUALIFIED Y/N <u> </u>
<ul style="list-style-type: none"> If so, were the results clear in terms of how they specifically affirm achievement of goals? 	YES <u> </u>	NO <u> </u>	QUALIFIED Y/N <u>X</u>
<ul style="list-style-type: none"> If so, were the results clear in terms of how they indicate need for improvement? 	YES <u> </u>	NO <u>X</u>	QUALIFIED Y/N <u> </u>
<ul style="list-style-type: none"> Were the results tied to goals for student learning? 	YES <u> </u>	NO <u> </u>	QUALIFIED Y/N <u>X</u>

Comments:

Because both the posted assessment plan and the first section of the assessment report outline 11 student learning goals (with no objectives), we anticipated that the assessment results would also focus on these 11 student learning goals. Instead the assessment results focus on 5 educational objectives. It is unclear how these educational objectives connect, if at all, to the previously stated learning goals. It is also unclear why the first section of the assessment report and the assessment plan focus on 11 student learning goals, whereas the results are focused on 5 educational objectives. Clarification is needed. Nonetheless, the findings from the alumni survey generally suggest that the civil engineering undergraduate program is meeting its 5 educational objectives. Results are also reported on the summer lab experience for distance students, which does not connect to any specific student learning goals of the program. No direct assessment results are reported.

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:

The results pertaining to the first educational objective (use knowledge and skills for problem solving...) may be applicable to the ES goal of thinking and reasoning. The results pertaining to the third educational objective (students continue learning after they have graduated) may be applicable to the institutional goal of lifelong learning.

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:

The department has implemented a number of changes to its program during the review period; however, these changes are unrelated to assessment results (change of prefix from CIEN to CE, faculty recruitment, faculty training in AutoCAD, and updating of articulation agreements). It appears that the program has two cohorts—an online/distance learning cohort and a face-to-face cohort. It would be worthwhile to disaggregate the results by cohort to ensure that the student learning goals are being met with each cohort.

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.
- 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:

It appears that the department is in a transitional period concerning assessment. The implementation of assessment methods seems to be picking up speed following a period of integrating and reflecting on the results of the 2009 ABET visit. We are hopeful that a new assessment plan will be posted soon.

MATERIALS REVIEWED

- X_____ Annual report
- _____ Appendices (cited in annual report)
- _____ Other (please describe)

- X_____ Assessment plan (as posted)
- X_____ Previous assessment review

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Section 1: ? Section 2: ? Section 3: ? Section 4: N

Coding Key:

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