

UNIVERSITY ASSESSMENT COMMITTEE
Feedback to Academic Departments on Assessment Activities Reported in 2010 Annual Reports
UNDERGRADUATE PROGRAMS

DEPARTMENT Physics DATE 11/10/11

COMMITTEE MEMBER(S) CONDUCTING REVIEW UAC Committee of the Whole

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 2004-05 Assessment Plan is the most recent plan available on the UAC website. Four goals were listed, three of which seem to be directly related to student learning. The goals themselves were not written as student-learning goals. Many of the objectives under each were listed as those things the department would provide or the students would practice and gain rather than what the students would know or be able to do as a result of instruction and practice. The related goals were as follows with those that more closely mirror student learning goal language in bold:

Student Learning Goal 1: Provide student with quality instruction in physics.

Objective 1.1: **Students will acquire a knowledge base in physics, including Newton's Laws and applications, Maxwell's equations, and the basic laws of thermodynamics.**

Objective 1.2: Department will provide good quality instruction through traditional lectures, and/or modern instructional technology and methods.

Student Learning Goal 2: Provide students with the discipline's tools and practical experience in physics.

Objective 2.1: **Students will be able to use their knowledge base to solve physical problems.**

Objective 2.2: Students will gain hands-on laboratory experience.

Student Learning Goal 3: Contribute to the student's general education.

Objective 3.1: Students will practice analytic and critical thinking.

Objective 3.2: Students will practice written communication skills.

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)
 ? 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...”)
 ? 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:

Although not directly stated in the Assessment Plan, objectives 1.1, 3.1, and 3.2 appear to be aligned with institutional and Essential Studies goals 1, 2 and 4. Objective 2.2 may also be aligned with institutional and Essential Studies Goal 3. Finally, student Learning Goal 3 may be aligned with Goal 7 lifelong, but we are not certain whether such an alignment is intentional.

2. ASSESSMENT METHODS

- Were any specific assessment methods referenced? YES X NO QUALIFIED Y/N
- If so, were specifically chosen assessment methods appropriately aligned with individual

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| goals? | YES_____ | NO_____ | QUALIFIED Y/N X__ |
| • Were both direct and indirect assessment methods used as components of a “multiple measures” approach? | YES__X__ | NO_____ | QUALIFIED Y/N _____ |

Comments:

The primary method of assessment described in the 2010 Annual Report was an “instrument conceived of by Michael Pickle of St. Cloud State, Department of Special Education.” This is a direct assessment consisting of a number of problem-solving items designed to assess student learning within the problem-solving laboratories attached to undergraduate courses. There was no direct reference to the goals listed in the Assessment Plan, but this assessment appears to be related to Objectives 1.1 and 2.1 above. It may also assess the objectives in Learning Goal 3, but these were not referred to directly in the report.

Surveys were noted in the report but we are not certain as to their connection to student learning goals.

3. ASSESSMENT RESULTS

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|--|----------|---------|---------------------|
| Were any assessment results reported? | YES__X__ | 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 __X__ |
| • If so, were the results clear in terms of how they indicate need for improvement? | YES__X__ | NO_____ | QUALIFIED Y/N _____ |
| • Were the results tied to goals for student learning? | YES_____ | NO_____ | QUALIFIED Y/N __X__ |

Comments:

The information provided near the end of the undergraduate section of the annual report did provide detail as to results as follows: “The recently developed assessment instrument had several items which showed students regressed – they were less expert in their thinking about these items at the end of the course than at the beginning. All these items dealt with aspects of circular motion: (a) circular motion dynamics, (b) each of Newton’s three laws of motion, and (c) work and energy.” This paragraph also included information which made a connection between the results and needs for improvement: “He was able to pinpoint which were the relevant reading assignments in each textbook and which parts of the lab units were involved. The next step is to make modifications of lab exercises relating to circular motion. The aim is to simplify them and focus on the basic ideas and require more in-class responses from students.”

The connection to student learning goals was not made specifically, and so it is difficult for an outside reader to be certain of an alignment between goals and results

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. .

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|---------|---|--|
| _____ | 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) |
| _____ | 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...”) |
| _____ | 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 assessment data reported appear intended to provide information about critical thinking and quantitative reasoning.

4. CLOSING THE LOOP

Were any actions taken on the basis of assessment results reported?

YES ☒ NO ☐ 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:

A number of actions related to the assessment results were reported including:

- new textbooks chosen for Physics 150, 161, 162, 211, 212, 251, and 252
- added pre-lab exercises students must do before coming to the laboratory
- instituted a summer GTA workshop to better prepare them to work in “Problem-solving Labs”
- introduced laboratory examinations in several introductory courses

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:

We applaud the labor intensive and creative assessment process put into place this year. We are impressed by the care and thoughtfulness that went into the design of the assessment processes described in the annual report. It is clear that the Physics department has done a great deal of work to develop an assessment that is tied to student learning and is using the results of that assessment to make changes.

It may be beneficial to update and post an Assessment Plan that aligns with the current assessment procedures and revises goals and objectives in language directly related to what students should know and be able to do.

It may also be interesting to add questions to the student surveys that gather information related to student learning goals directly if the program has not already done so.

MATERIALS REVIEWED

- ☒ Annual report
☐ Appendices (cited in annual report)
☐ Other (please describe)

- ☒ 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 reported
- ? = action or progress is apparent; however, evidence is lacking that this is completely and appropriately done