UNIVERSITY ASSESSMENT COMMITTEE
Feedback to Academic Departments on Assessment Activities Reported in *2013-2014(Academic year)*

UNDERGRADUATE PROGRAMS

DEPARTMENT__*Computer Science*_____**DATE** ___*April 1, 2015*_____

PROGRAM(S) COVERED IN REVIEW _____*Bachelor of Science/Arts*_____

COMMITTEE MEMBER(S) CONDUCTING REVIEW__*Shari Nelson, James Casler*_____

1. STUDENT LEARNING GOALS

- Were any goals referenced?   YES__X__   NO____   QUALIFIED Y/N ___
- If so, were goals well articulated?   YES__X__   NO____   QUALIFIED Y/N ___
- Do goals address student learning?   YES__X__   NO____   QUALIFIED Y/N ___

Comments:

The goals in the October, 2013 undergraduate assessment are clearly articulated. They are initially stated as three goals but then are refined into student learning objectives, student learning outcomes, and program evaluation criteria. The student learning objectives are:

Graduates from the Computer Science undergraduate programs will:
1. *have sufficient knowledge and skills in the foundations and application of computer science to be successful in employment or in graduate school,*
2. *be guided by ethical principles in their careers,*
3. *be prepared to assume leadership roles in professional and community life, and*
4. *be aware of the need for continuous, life-long learning.*

Student learning outcomes:

1. *Knowledge of programming language principles*
2. *Knowledge of the software development process*
3. *Knowledge of computing systems*
4. *Knowledge of ethical principles and social implications of computing*
5. *The ability to communicate effectively, both orally and in writing*
6. *Proficiency in programming and software development*
7. *The ability to conduct sound scientific investigation and analysis*
8. *A broad general education background*

These learning outcomes are then further defined as goals and outcomes for each course in the curriculum.

In addition to the program 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 program goals.
_X(5)_ 1 Communication – written or oral ("able to write and speak in various settings with a sense of purpose/audience")
X(1,2,7) 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(7)_ 4 Thinking and reasoning – quantitative reasoning ("apply empirical data…analyze graphical information")
_X(4)_ 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 program goals and alignment with institutional and Essential Studies goals:

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 goals?   YES_X__   NO____   QUALIFIED Y/N ____
- Were both direct and indirect assessment methods used as components of a "multiple measures" approach?   YES_X__   NO____   QUALIFIED Y/N ____

Comments:

The department assessment plan calls for both indirect and direct assessment methods. Indirect assessment includes an Exit Survey in which students assessed their own accomplishments and the quality of their education. The typical survey question uses a 5-point scale through which students express their strength or weakness of agreement with a statement regarding a feature of the department's curriculum or program. The intent is to target ratings of 3.0 to 3.5 for improvement in the next survey cycle, and to take immediate action on those below a 3.0. Post-graduate alumni survey are also conducted, if possible, once every four year, in addition to employer surveys.

Direct assessments were conducted in required courses CSci 161, 363, 370, and 451, following the schedule of the department assessment plan. Levels of knowledge attainment were rated on a 5 point scale with the following rankings: Inadequate, Weak, Adequate, Solid, Strong, and were evaluated by the instructor of each course using a variety of methods including essay questions, midterm and final exams, assignments, and projects.

3. ASSESSMENT RESULTS

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_X_   NO____   QUALIFIED Y/N ____
- 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_X_   NO____   QUALIFIED Y/N ____

Comments:

The department's assessment report provides a very detailed description of its assessment finding. Unfortunately, the Exit Survey was not administered to spring graduates, due to error as a result of secretarial turnover. Therefore, only three students completed the survey, resulting in a small sample size. Mention is made in the report that all dissatisfied responses came from one student; without this one student the average response was 3.0 or higher. No results were presented from alumni or employer surveys, but this may be the result of the four year cycle.

Direct assessment reporting included results from each course outlining the type of assessment and results of outcomes addressed in that course. Results of knowledge ranged from Weak to Solid. Other relevant findings are described in #4-Closing the Loop.

In addition to program goals, some assessment results may be applicable to institutional and Essential Studies goals. Indicate any goals for which the program presents findings, and, for indicated items, describe findings below.
___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")
___X__ 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 program, institutional, and Essential Studies goals:

Results reported did not include findings for #7 and #8 from the department's assessment plan.

4. CLOSING THE LOOP

Were any actions taken on the basis of assessment
results reported?   YES___X__   NO____   QUALIFIED Y/N ____

- If so, do curricular or other improvements/
  changes arising from assessment results
  directly address goals for student learning?   YES___X__   NO____   QUALIFIED Y/N ____

Comments:

The department is making several changes based on assessment results. The assessment plan was updated and questions were added to the Exit Survey to ensure that all program outcomes have some annual indirect assessment data.

The department is currently engaged in two continuing assessment-driven program-level initiatives:

1. *Monitor and seek improvement in the attainment of Outcome #3: Knowledge of computing systems, which showed weakness in the ABET Focused Report of Summer 2013. (The assessment from CSci 451 shows some improvement in this area.)*
2. *Monitor the progress of new courses CSci 492: Senior Project I and CSci 493: Senior Project II.*

The department is also making a transition from CSci 435 to CSci492 as the ES Capstone course. The transition was a result of direct assessment data that showed weakness in the communications component of CSci 435 and indirect assessment data from alumni and employers regarding the need for more practical computing projects in the curriculum. (This is a two year transition period.)

SUMMARY

Strengths	***Areas for Improvement***
_X_ A specific plan for assessment is in place.	____ No specific plan for assessment is in place.
____Student learning goals are well-articulated.	____ Student learning goals are not well-articulated.
_X__Assessment methods are clearly described.	____ Assessment methods are not clearly described.
____Assessment methods are appropriately selected.	____ Assessment methods are not appropriately selected.
_X__Assessment methods are well-implemented.	____ Assessment methods are not well-implemented.
_X__Direct and indirect methods are implemented.	____ A single type of assessment methods predominates.
_X__Results are reported.	____ No results are reported.
_X__Results are tied to closing the loop.	____ Results are not clearly tied to closing the loop.
(Decision-making is tied to evidence.)	(Decision-making is not directly tied to evidence.)

OVERALL SUMMARY AND RECOMMENDATIONS:

The Computer Science department assessment plan shows strong initiative and efforts in assessing student learning in order to bolster its curriculum and its graduates' knowledge and preparation for the workforce. Several types of indirect and direct assessment methods were used, and results and closing the loop activities were discussed thoroughly. The plan is set up in a clear, measurable manner that allows the department to easily determine what goals are being met and what areas need further attention. In addition, it is easy to read for an outside reader unfamiliar with the department, and should provide useful information for both the department and its current students, as well as prospective students and parents.

The CSci department should be commended for transparency in addressing its weakness (areas of improvement) while promoting its strengths. . It would be helpful to see more data reported for the alumni and employer surveys, as it was referenced in the closing the loop summary.

In addition, because the program offers both Bachelor of Science and Bachelor of Arts degress, it would be beneficial to know if learning outcomes differ for each program. If so, it would be interesting to see how these learning outcomes and the resulting data compare and contrast.

MATERIALS REVIEWED

__X__ Annual assessment report
__X__ Assessment plan (as posted)
__X__ Previous assessment review
_____ Other (please describe)

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Section 1: __Y___   Section 2: __Y___   Section 3: __Y___   Section 4: __Y___

Coding Key:
    Y   = yes, this is done appropriately and well (bearing in mind the kind of program(s) reviewed and recognizing that assessment is a cyclical process, i.e., with additional kinds of data to be collected and analyzed in other years)
    Q   = qualified yes as action or progress is apparent; however, evidence is lacking that this is completely and appropriately done
    N   = no, this is not done at all, or it is not done in relationship to student learning
    N   = no, it is unclear whether it was done at all, or it is not done in relationship to student learning

Revised Sept 24, 2014

GRADUATE PROGRAMS

DEPARTMENT *Computer Science*   **DATE** *April 1, 2015*

PROGRAM(S) COVERED IN REVIEW *Master of Science*

COMMITTEE MEMBER(S) CONDUCTING REVIEW *Shari Nelson, James Casler*

1. STUDENT LEARNING GOALS

- Were any goals referenced?   YES__X__   NO____   QUALIFIED Y/N ___
- If so, were goals well-articulated?   YES__X__   NO____   QUALIFIED Y/N ___
- Do goals address student learning?   YES__X__   NO____   QUALIFIED Y/N ___

Comments:

The Computer Science department has the following learning goals and objectives for its Master of Science graduates:

Goal 1: Students will acquire a broad knowledge of theoretical and applied topics in computer science and develop communication skills.
   Objective 1.1: Students will demonstrate a mastery of material presented in two courses covering theoretical topics.
   Objective 1. 2: Students will be able to organize and present information orally, visually, and in writing.

Goal 2: Thesis track students will develop creative thinking, problem solving and research skills, and acquire expertise in a scientific computer science domain.
   Objective 2.1: Students will be able to investigate and thus master a domain of research in computer science. Students will also demonstrate creative thinking and problem solving skills towards the development of an original contribution towards that domain.

Goal 3: Applied Software Engineering track students will develop problem solving skills and acquire software engineering skills.
   Objective 3.1: Students will be able to acquire and document systems requirements of diverse and customer driven software products. The essence of this objective is to write down, and to keep current the presentation and results of design decisions together with the rational behind their design decisions in an accessible and meaningful form.
   Objective 3.2: Students will demonstrate problem solving skills and the ability to develop software using established software engineering methods and tools.

Goal 1 and its objectives apply to all CSci graduate students, while Goals 2 and 3 are specific to tracks of study.

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 goals?   YES___X__   NO____   QUALIFIED Y/N ____
- Were both direct and indirect assessment methods used as components of a "multiple measures" approach?   YES_____   NO__X_ QUALIFIED Y/N ____

Comments:

The departmental assessment plan clearly outlines its assessment methods for each objective including:

1. *Courses providing the educational experience*
2. *Type of assessment(s)*
3. *Criteria used by faculty/staff to determine level of knowledge attained*
4. *Timeline*
5. *Responsibilities*
   a. *Writing and grading*
   b. *Data compilation and analysis*
6. *Use of results and process for documentation and decision-making*

Direct assessment methods include comprehensive examination scores, defense assessment, software engineering projects, independent research/theses, and independent studies. All of these are rated on a 5 point scale ranging from Unacceptably to Excellently. As referenced in the 2011 review, there is no descriptive information provided that indicates what each scale means (For example, the difference between "satisfactorily" vs. "excellently")

No indirect assessment was referenced in the assessment plan.

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:

The department advises that students have not been completing their theses and independent studies in a timely manner over the period of the past six years. This is partly attributed to students struggling to meet Goal 1 on the Graduate Qualifying Exams (GQE). Therefore, beginning in Fall 2013, the department enforced new policy that requires any student failing the GQE on the first attempt must retake the corresponding course(s) covered by GQE in order to be eligible to take the exam for the second and last time. They are currently in the process of collecting information regarding the past few Graduate Qualifying Exams (GQE) held since the new policy became effective (Fall 2013).

It is commendable that the department took action and implemented new policy, thereby affecting result reporting on this method. However, it would be beneficial to report on the results of the other types of assessment data collected, including comprehensive exams and the software engineering project. (For example, the assessment plan states that comprehensive exam data will be collected as each course and core exam is offered and analyzed once a year.)

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 reports that no changes were made due to lack of data to support any changes.

SUMMARY

Strengths	*Areas for Improvement*

_X_ A specific plan for assessment is in place.
_X_ Student learning goals are well-articulated.
_X_ 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.)

____ 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.
_X_ 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:

The department assessment plan is very thorough and concise; easy for an outside reader to follow and understand. It appears to be a very robust plan but without results reporting and closing of the loop, it is difficult to determine what assessment methods were actually implemented. It is understandable that some data are not available, due to implementation of a new policy in Fall 2013 to correct issues with the GQE and resulting completion of theses and independent studies. However, results from individual courses would be helpful and could assist in closing the loop on a smaller level. Also, the committee recommends implementing indirect assessment to round out the picture (Exit Survey, Alumni/Employer Survey).

MATERIALS REVIEWED

__X__ Annual assessment report
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