

Computing Science BS
Assessment Plan Summary

Computing Science BS

Ethical Principles, Technical Skills, And Management Skills (core)

Goal Description:

To develop students’ knowledge of ethical principles, technical skills, and management skills relevant to the field of computer science.

RELATED ITEMS/ELEMENTS-----

RELATED ITEM LEVEL 1

Acquisition Of Technical Skill, Management And Ethical Principles

Learning Objective Description:

Students will develop and demonstrate knowledge of ethical principles, technical skills, and management skills relevant to the field of computer science.

RELATED ITEM LEVEL 2

Capstone Project, Ethics Question, And TASO

Indicator Description:

All undergraduate CS students must complete COSC 4319 (Software Engineering) and COSC4349 (Professionalism and Ethics) prior to graduation. In addition, COSC4319, as a capstone course, covers the eight Student Outcomes (except the three outcomes (e), (g) and (h)) out of the eleven Student Outcomes and COSC4349 addresses the remaining three outcomes. Therefore, both the courses are selected for assessment. Additionally, TASO (Test for Assessing Student Outcomes) is implemented to quantitatively measure the eleven SOs. It is required for senior students to take it in senior-level Software Engineering course, prior to graduation regardless of their program concentration.

Criterion Description:

To perform a quantitative assessment, the following rubrics for the two courses are developed: (1) rubric for Project, (2) rubric for presentation evaluation, (3) rubric for group member evaluation, and (4) rubric for ethics topics. For COSC4319, faculty members observe students’ project presentation and directly evaluate students’ performance based upon the rubrics (1)-(3). One the other hand, for COSC4349, students’ performance is indirectly evaluated through the exam questions that address rubric (4). Each category is rated with the following scale values: (1) 1.0 (below expectations or unacceptable), (2) 2.0 (evolving or developing), (3) proficient (or competent), and (4) outstanding (or exemplary). Student’s performance on Student Outcomes is directly evaluated with each specific rubric, while the performance on objectives is indirectly measured by mapping between Student Outcomes and Program Objectives.

Questions on TASO are based on topics from a number of required core courses (including COSC 1436, 1437, 2329, 3318, 3319, 4318, 4319, and 4349). Currently, it contains 26 multiple choice questions and 1 short answer question. Each multiple choice question has five choices, including the last choice of “I don’t know”. The percentage of students who select the correct answer to each given question will be computed and evaluated.

Findings Description:

Student performance on the capstone project in COSC 4319 addresses 8 of the 11 ABET/CAC Student Outcomes.

The Ethics Test covers the three outcome that are not addressed by the Project assessment.

Fall 2014 to 2015 results showed an improvement in all Student Learning Outcomes (SLO's) with the exception of outcome G; An ability to analyze the global impact of computing on individuals, organizations and society.

Spring 2015 to Spring 2016 showed mixed results with little overall year on year change, and those changes well within one standard deviation. One exception was outcome H; Recognition of the need for, and an ability to engage in continuing professional development. This outcome showed a significant (more than one standard deviation) improvement,

One of the four Educational Objectives, all showed slight (< one standard deviation) improvement from fall 2014 to fall 2015, and three of the four showing improvement from Spring 2015 to Spring 2016. The exception being EO3, Graduates will exhibit the professional skills necessary to be effective and succeed in the modern workforce including the ability to function in teams, the ability to communicate effectively, and high standard of ethics and professionalism.

Reviewing the individual student responses in the TASO, as submitted in supporting documentation, it is clear that retention of conceptual material varies significantly across courses, with COSC 3318 Database Management Systems, and COSC 4319 Software Engineering producing high quality responses. There is concern that the COSC 1436, 1437, and 3319 sequence produces less consistent results.

Attached Files

- [☐ Student learning outcomes and Program Educational Objectives.docx](#)
- [☐ TASO-assessment_S16](#)

RELATED ITEM LEVEL 3

Curriculum Review

Action Description:

The department will continue to review curriculum in the Computing Science program to ensure compatibility with ABET accreditation standards.

Specialized Competencies

Goal Description:

To develop students’ skills and knowledge in their concentration areas. The department offers three concentration areas: Computer Science, Information Systems, and Information Assurance.

RELATED ITEMS/ELEMENTS -----

RELATED ITEM LEVEL 1

Specialized Skills

Learning Objective Description:

Students will develop and demonstrate skills and knowledge in their concentration areas. The department offers three concentration areas: Computer Science, Information Systems, and Information Assurance.

RELATED ITEM LEVEL 2

Faculty Review

Indicator Description:

During department meetings faculty with expertise in the three concentration areas will discuss students’ performances in their concentration areas. We expect that faculty in each concentration area will evaluate the students' performances across the 18 hours course sequence for each concentration.

Criterion Description:

In last year's review the faculty assessed more than 70% of the students were performing at or above expected levels. As a result, the faculty set a higher expectation. We expect that the faculty will deem at least 72% or more of students’ performances as acceptable.

Findings Description:

During the academic year (2011-2012), Computer Science (CS) faculty developed indirect program assessment tools and rubrics to address the new ABET-CAC (Computing Accreditation Commission) criteria, which includes eleven Student Outcomes (SOs) ((a)-(k)). In particular, CS Department set up four Program Education Objectives (PEOs) (E01-E04). For the quantitative assessment and continuous improvement of the program, the tools and rubrics have been continuously used since the 2011-2012 academic year. The students in two courses, COSC4319 (Software Engineering) and COSC4349 (Professionalism and Ethics) participated in this indirect assessment every fall and spring semester since Spring 2012. In addition, another assessment tool, TASO (Test for Assessing Student Outcomes), was implemented for the direct assessment of the students’ outcomes. This direct assessment was first performed in Spring 2013 and is also applied for this academic year as well.

The TASO results can be summarized as follows:

- Student performance has show small but continuous improvements since 2013 accros the 11 Student Learning Objectives identified by, and measured by the department.
- Four Student Learning Objectives have been identified as requiring the most attention; 1) the ability to apply knowledge of computing and mathematics appropriate to the discipline, 2) the ability to analyze a problem, and identify and define the computing requirements appropriate to its solution, 3) the ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs, and 9) the ability to use current techniques, skills, and tools necessary for computing practice. (SLO's 1,2,3, and 9)
- Performance on the program's four Learning Objectives had shown steady improvement since 2013. In particular SLO's 1, 2, and 3 show marked improvement from the previous assessment period.

Update to Previous Cycle's Plan for Continuous Improvement

Previous Cycle's Plan For Continuous Improvement (Do Not Modify):

The Undergraduate Curriculum Committee will investigate a weighting mechanism to adjust TASO for difference in student numbers in the Software Engineering and Ethics courses to better represent their influence in the summary statistics.

The Undergraduate Curriculum Committee will review TASO and the Capstone project Assessment Mechanism to all differentiation and comparison between outcomes for Computing Science and for Computer Software Engineering Technology students.

Update of Progress to the Previous Cycle's PCI:

In general, the program appears to be addressing the stated Student Learning Objectives and Program Educational Outcomes in a quality manner. However, the Undergraduate Curriculum Committee should continue it's work in developing a weighting mechanism for the TASO questions in order to emphasize the most critical SLO's.

In addition, the Undergraduate Curriculum Committee will perform a comprehensive review of the content and sequencing of material in the COSC 1436, 1437, 3319 sequence to address inconsistent student responses in the TASO.

Curriculum and Assessment

Closing Summary:

The Curriculum Committee has expressed some concerns over content coverage in COSC 1436/1437/3319. This should be reviewed in the upcoming cycle.

The Curriculum Committee is concerned about aligning assessment between Computing Science and Software Engineering Technology. This also should be reviewed, with recommendations for implementation in the next cycle.