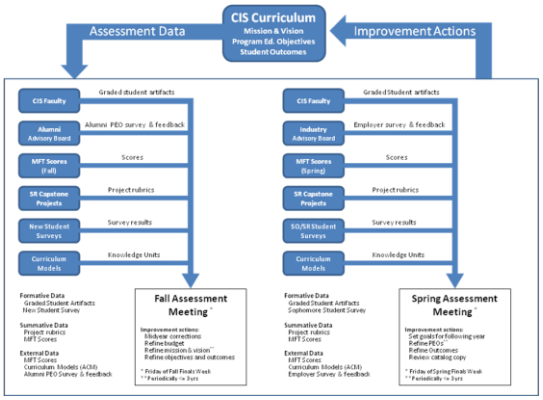
Annual Report for Assessment

Department of Computer and Information Sciences **Academic Year** 2016-17

Date due _____ **Date received** _____



CIS Department Assessment Flowchart

The overall assessment of the CIS Department's educational programs occurs by collecting pertinent data, gathering input from stakeholders, setting appropriate goals, then systematically reviewing how well the programs meet those goals and making adjustments to the program's components to meet that end. The CIS Department assessment schema is shown above.

List or attach the student learning objectives being assessed this year.

The 10 student learning objectives (outcomes) for the SBU Computer Information Science degree are listed below:

1. An ability to apply knowledge of computing and mathematics appropriate to the discipline
2. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
3. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
4. An ability to function effectively on teams to accomplish a common goal
5. An understanding of professional, ethical, legal, security and social issues and responsibilities
6. An ability to communicate effectively with a range of audiences
7. An ability to analyze the local and global impact of computing on individuals, organizations, and society
8. Recognition of the need for and an ability to engage in continuing professional development
9. An ability to use current techniques, skills, and tools necessary for computing practice
10. An ability to apply design and development principles in the construction of software systems of varying complexity

The computer information science curriculum is designed to enable the student learning objectives (outcomes). Table 1 below shows the relationship of the courses in the student outcomes and their supporting required courses in the computer science curriculum.

Table 1: Outcomes and supporting curriculum components

Courses Outcomes	Sem CIS 1001	Fnd CIS 1033	CS1 CIS 1144	CS2 CIS 1154	Net CIS 2013	ISAD CIS 2213	DB CIS 3323	ADS CIS 3333	MO CIS 3413	CIS 4462 4472
1.			X	X				X		
2.			X	X	X	X		X		X
3.			X	X	X	X	X			X
4.		X		X	X	X				X
5.	X	X			X	X				
6.	X				X	X				X
7.	X	X								
8.	X									X
9.							X		X	X
10.			X						X	X

The student learning objectives (outcomes) appear on the Department website, and are a part of the syllabus template used by the CIS Department. The outcomes appear in the syllabi for the CIS core courses required for all CIS students.

1. List assessment tools implemented this year related to your student learning objectives and the findings from each. When appropriate, show results from all three types of assessment *(1. Students assessing the program, 2. Program assessing the students, and 3. Program comparison to other programs or national comparisons.)* Attach samples of any non-standardized tools that you used.

Student Outcomes

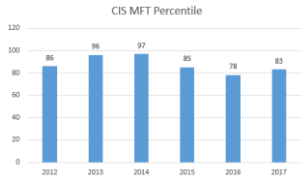
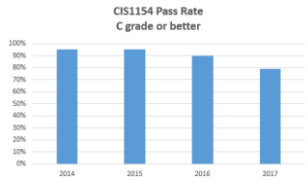
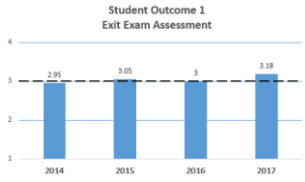
Shown below is a table describing the assessment tools implemented this year which address the computer information science learning objectives (outcomes).

Assessment Process & Description	Frequency	Documentation & Maintenance
Student Outcome Survey ***Students Assessing The Program*** The outcome survey is administered to graduating seniors. The outcome survey consists of the student outcomes (1-10) and a 4 point scale of self-assessed achievement. Results and proposed curriculum changes are discussed at the appropriate assessment meeting (fall or spring).	Each Spring	The anonymous paper surveys are kept in a filing cabinet in the Department Chair's office. The tabulated results are kept in a spreadsheet on a shared network drive. The survey was begun to address formative assessment needs.
Major Field Test ***Program Comparison to Other Programs*** The ETS' Major Field Test (MFT) is a nationally-normed exam providing comparative data and percentile ranking information with other institutions granting degrees in computer science. Institutional scores and proposed improvement measures are discussed each spring assessment meeting.	Yearly	The MFT is administered and maintained by the Office of Institutional Effectiveness. Results are tabulated by ETS and reported back to the University. Scores for individual students and for the CIS Department as a whole are kept on the University's Portal.
Student Artifacts from Capstone Course ***Program Assessing The Students*** The senior capstone sequence (CIS4462 and CIS4472) results in a series of artifacts contained in a portfolio useful for assessing the student outcomes. These artifacts are assessed by the entire CIS faculty with a common rubric. Results are discussed and improvement measures proposed in the assessment meetings each semester.	Annually Each Spring	Each senior project team of 2-5 students is required to produce both a digital and printed version of their senior project documents. The printed documents are kept for a year in the Department Chair's office, then bound and placed in the Department Library. Digital copies are kept on a departmental external hard-drive.
Course Pass Rates ***Program Assessing The Students*** CIS1154 (Computer Science 2) is a core course and prerequisite for the largest number of succeeding courses of all courses in the CIS Department curriculum. The pass rate for this course is a significant indicator of success for the students in the CIS Department	Annually	The CIS1154 course pass rate is calculated each fall and spring.
Alumni Survey and Feedback ***Alumni Assessing the Program*** The CIS Department hosts an alumni advisory board each fall for alumni who have graduated between 1 and 5 years previously. A survey is administered at each meeting of the Alumni Advisory Board. Results and proposed changes are discussed at the fall assessment meeting.	Annually Each Fall	The anonymous paper surveys are kept in a filing cabinet in the Department Chair's office. The tabulated results are kept in a spreadsheet on a shared network drive. Feedback is recorded in the minutes of the Alumni Advisory Board and posted on the shared network drive.
Industry Advisory Board Feedback ***Program Comparison to Other Programs*** The CIS Department hosts an Industry Advisory Board each spring for companies who regularly hire alumni of the CIS Department.	Annually Each Spring	Feedback is recorded in the minutes of the Industry Advisory Board and posted on the shared network drive.

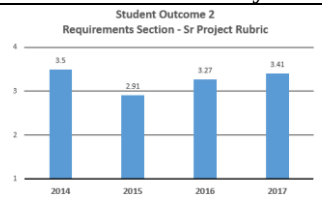
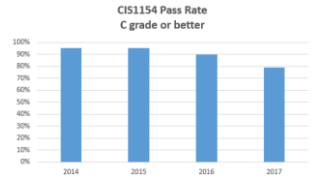
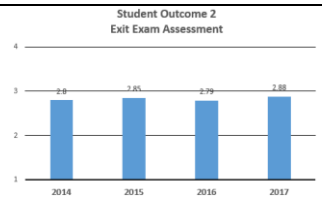
Show any data gathered and analyze the assessment results.

Each student learning objective (outcome) and the assessment practices associated with the student outcome are shown below.

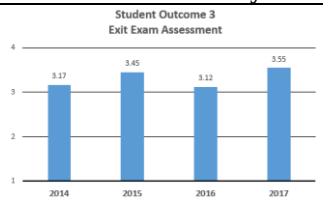
Student Learning Objective (SO) 1:
An ability to apply knowledge of computing and mathematics appropriate to the discipline.
Educational Strategies from Table 1: 1144, 1154, 3333

Assessment Process	Expected Attainment	Results Summary	Data Collection	Analysis
External/ Summative: Major Field Test	Institutional Score >= 50th percentile		Annual	Computer Information science graduates perform well on the major field test consistently scoring as a group above the national average.
Internal/ Formative CIS1154 Pass Rate	70% of students should pass CIS1154 with a C or better (CIS1154 is the prerequisite for a majority of CIS courses)		Annual	The data showed continuing success in achieving the expected level of attainment.
External/ Summative: (2015 was the first year assessed)	Mean score should >= 3.0 on 1-5 scale. Given to alumni on alumni advisory board. This group changes yearly.	**Year/Mean** 2015: 4.5 2016: 4.3	Annual in Fall	Survey results exceeded the expected level of attainment.
Internal/ Summative: Exit Exam	Mean score should >= 3.0. Given to seniors in capstone course.		Each Spring	Survey results exceeded the expected level of attainment.

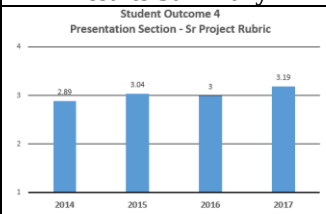
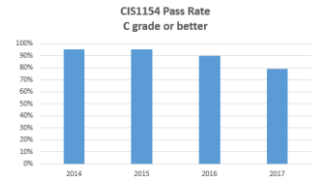
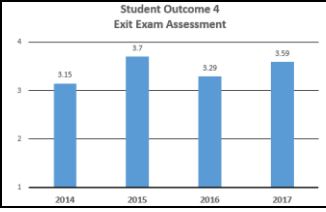
STUDENT LEARNING OBJECTIVE (SO) 2:
An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
Educational Strategies from Table 1: 1144, 1154, 2213, 3333, 4462, 4472

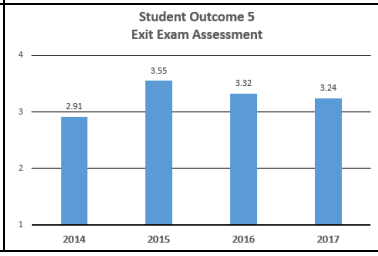
Assessment Process	Expected Attainment	Results Summary	Data Collection	Analysis
Internal/ Summative: Senior Project Rubric	All teams should receive a mean score >= 3 on **Requirements Section** of rubric. Note: the target score was >= 4 prior to 2015.		Each Spring	The Requirements Section of the Rubric assesses performance related to **problem definition** and **requirements.**
Internal/ Formative CIS1154 Pass Rate	70% of students should pass CIS1154 with a C or better (CIS1154 is the prerequisite for a majority of CIS courses)		Annual	The data showed continuing success in achieving the expected level of attainment.
External/ Summative: Alumni Survey (2015 was the first year assessed)	Mean score should >= 3.0 on a 1-5 scale. Given to alumni on alumni advisory board. This group changes yearly.	**Year/Mean** 2015: 4.67 2016: 4.10	Annual in Fall	Survey results exceeded the expected level of attainment.
Internal/ Summative: Exit Exam	Mean score should >= 3.0. Given to seniors in capstone course.		Each Spring	The results, while close, do not exhibit the level of attainment desired. This area remains a continuing topic during curriculum meetings.

STUDENT LEARNING OBJECTIVE (SO) 3:
An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
Educational Strategies from Table 1: 1144, 1154, 2213, 3323

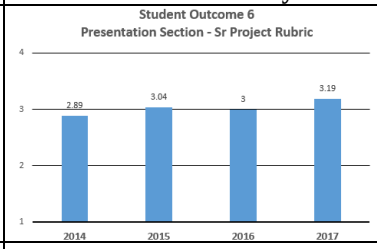
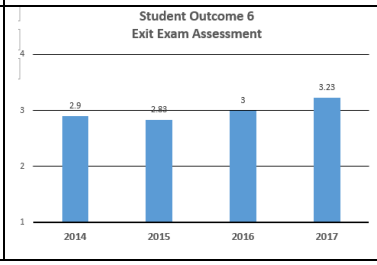
Assessment Process	Expected Attainment	Results Summary	Data Collection	Analysis
Internal/ Summative: Senior Project Rubric	All teams should receive a mean score >= 3.0 on **Total Score** of the rubric. Note: prior to 2014-15, the target score was 4.0.		Each Spring	The expected level of achievement was attained.
External/ Summative: Alumni Survey (2015 was the first year assessed)	Mean score should >= 3.0 on a 1-5 scale. Given to alumni on alumni advisory board. This group changes yearly.	**Year/Mean** 2015: 4.42 2016: 4.20	Annual in Fall	Survey results exceeded the expected level of attainment.
Internal/ Formative CIS1154 Pass Rate	70% of students should pass CIS1154 with a C or better (CIS1154 is the prerequisite for a majority of CIS courses)		Annual	The data showed continuing success in achieving the expected level of attainment.

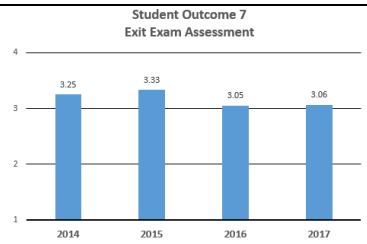
STUDENT LEARNING OBJECTIVE (SO) 4:
An ability to function effectively on teams to accomplish a common goal
Educational Strategies from Table 1:1033, 1154, 2213, 3313, 4462/72

Assessment Process	Expected Attainment	Results Summary	Data Collection	Analysis
Internal/ Summative: Senior Project Rubric (Presentation)	All teams should receive a mean score >= 3 on **Presentation Section** of rubric		Each Spring	The presentation section assesses, via information presented, the success of the team in accomplishing the goal of a successful project. The score exceeds the target.
External/ Summative: Alumni Survey (2015 was the first year assessed)	Mean score should >= 3.0 on a 1-5 scale. Given to alumni on alumni advisory board. This group changes yearly.	**Year/Mean** 2015: 4.5 2016: 4.2	Annual in Fall	Survey results exceeded the expected level of attainment.
Internal/ Formative CIS1154 Pass Rate	70% of students should pass CIS1154 with a C or better (CIS1154 is the prerequisite for a majority of CIS courses)		Annual	The data showed continuing success in achieving the expected level of attainment.
Internal/ Summative: Exit Exam	Mean score should >= 3.0. Given to seniors in capstone course.		Each Fall/Spring	Survey results exceeded the expected level of attainment.

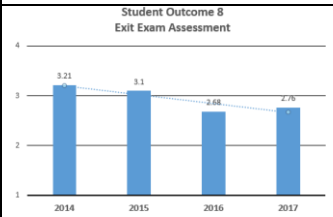
STUDENT LEARNING OBJECTIVE (SO) 5: **An understanding of professional, ethical, legal, security and social issues and responsibilities** Educational Strategies from Table 1: 1001, 1033, 2213, 3313, 4462, 4472				
Assessment Process	**Expected Attainment**	**Results Summary**	**Data Collection**	**Analysis**
External/ Summative: Alumni Survey (2015 was the first year assessed)	Mean score should >= 3.0. Given to alumni on alumni advisory board. This group changes yearly.	**Year/Mean** 2015: 3.91 2016: 3.90	Annual in Fall	Survey results exceeded the expected level of attainment, but because this score was the lowest recorded, the faculty will address this value in the fall assessment meeting.
Internal/ Summative: Exit Exam	Mean score should >= 3.0. Given to seniors in capstone course.		Each Spring	Survey results exceeded the expected level of attainment for the last three years.

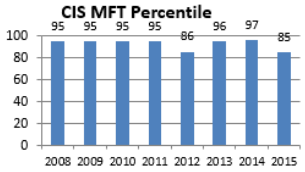
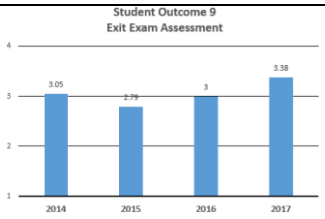
STUDENT LEARNING OBJECTIVE (SO) 6:
An ability to communicate effectively with a range of audiences
Educational Strategies from Table 1: 1001, 2213, 3313, 4462, 4472

Assessment Process	Expected Attainment	Results Summary	Data Collection	Analysis
Internal/ Summative: Senior Final Presentation Rubric	All teams should receive a mean score >= 3 on the **Presentation Section** of rubric		Each Spring	Assessment showed satisfaction of the learning outcome based on the presentation of the senior project.
External/ Summative: Alumni Survey (2015 was the first year assessed)	Mean score should >= 3.0. Given to alumni on alumni advisory board. This group changes yearly.	**Year/Mean** 2015: 4.67 2016: 3.9	Annual in Fall	Survey results exceeded the expected level of attainment, this score is lower than expected and will be discussed in the fall assessment meeting.
Internal/ Summative Exit Exam	Mean score should >= 3.0. Given to seniors in capstone course.		Each Spring	Survey results exceeded the expected level of attainment for the past two years.

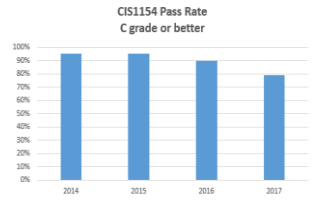
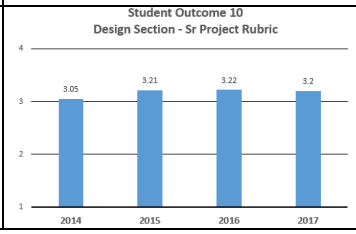
STUDENT LEARNING OBJECTIVE (SO) 7: **An ability to analyze the local and global impact of computing on individuals, organizations, and society** Educational Strategies from Table 1: 1001, 1033, 4462, 4472				
Assessment Process	**Expected Attainment**	**Results Summary**	**Data Collection**	**Analysis**
External/ Summative: Alumni Survey (2015 was the first year assessed)	Mean score should >= 3.0. Given to alumni on alumni advisory board. This group changes yearly.	**Year/Mean** 2015: 4.3 2016: 4.0	Annual in Fall	Survey results exceeded the expected level of attainment.
Internal/ Summative: Exit Exam	Mean score should >= 3.0 on a 4.0 scale. Given to seniors in capstone course.		Each Spring	Assessment results exceeded the expected level of attainment.

STUDENT LEARNING OBJECTIVE (SO) 8:
Recognition of the need for and an ability to engage in continuing professional development
Educational Strategies from Table 1: 1001, 4462, 4472

Assessment Process	Expected Attainment	Results Summary	Data Collection	Analysis
External/ Summative: Alumni Survey (2015 was the first year assessed)	Mean score should >= 3.0. Given to alumni on alumni advisory board. This group changes yearly.	**Year/Mean** 2015: 4.19 2016: 3.6	Annual in Fall	Eleven respondents. Survey results exceeded the expected level of attainment.
Internal/ Summative: Exit Exam	Mean score should >= 3.0. Given to seniors in capstone course.		Each Spring	Survey results show the beginning of a downward trend. Discussion at the spring assessment meeting concluded students are unaware of professional development activities (career fairs, presentations, guest speakers, etc.). Therefore greater emphasis will be placed on why these activities exist and communicated to the students.

STUDENT LEARNING OBJECTIVE (SO) 9: **An ability to use current techniques, skills, and tools necessary for computing practice.** Educational Strategies from Table 1: 2233, 2253, 3333, 4462, 4472				
Assessment Process	**Expected Attainment**	**Results Summary**	**Data Collection**	**Analysis**
External/ Summative: Major Field Test	Institutional Score >= 50th percentile		Annual	The Computer science Major Field Test is updated every 4-5 years to remain current with regard to computing practice. Information Science graduates have consistently exceeded the expected level of attainment.
External/ Summative: Alumni Survey (2015 was the first year assessed)	Mean score should >= 3.0. Given to alumni on alumni advisory board. This group changes yearly.	**Year/Mean** 2015: 4.67 2016: 4.30	Annual in Fall	Twelve respondents. Survey results exceeded the expected level of attainment.
Internal/ Summative: Exit Exam	Mean score should >= 3.0. Given to seniors in capstone course.		Each Spring	Assessment results exceeded the expected level of attainment in all but one year.

STUDENT LEARNING OBJECTIVE (SO) 10:
An ability to apply design and development principles in the construction of software systems of varying complexity.
Educational Strategies from Table 1: 1144, 1154, 2213, 4462, 4472

Assessment Process	Expected Attainment	Results Summary	Data Collection	Analysis
Internal/ Summative: Direct Assessment of Senior Project Artifacts.	90% of seniors should complete 4472 with a grade of C or better.	**Year/% Passing** 2010: 100% 2011: 92% (11/12)* 2012: 100% 2013: 100% 2014: 100% 2015: 100% 2016: 100% 2017: 100% *NOTE: One student failed the course due to attendance requirements and retook it successfully the following year.	Each Spring	This course can only be reached after applying design and development principles to systems of varying complexity in 1144, 1154, 2213, 4462 and 4472.
External/ Summative: Alumni Survey (2015 was the first year assessed)	Mean score should >= 3.0. Given to alumni on alumni advisory board. This group changes yearly.	**Year/Mean** 2015: 4.1 2016: 4.0	Annual in Fall	Survey results exceeded the expected level of attainment.
Internal/ Formative	70% of students should pass CIS1154 with a C or better (CIS1154 is the prerequisite for a majority of CIS courses)		Annual	The data showed continuing success in achieving the expected level of attainment.
Internal/ Summative: Senior Project Rubric	All teams should receive a mean score >= 3 on the **Design Section** of rubric		Each Spring	Survey results exceeded the expected level of attainment.

2. Discuss the ways in which your assessment results indicate that your student learning objectives are being met. *(Be sure to tie your discussion to the available data.)*

Learning objectives are assessed using a variety of instruments and approaches including direct assessment of student artifacts, indirect assessment through surveys, both internal and external assessment, and with annual and longitudinal assessment. The available data (shown above in previous section) presents strong evidence that the learning objectives are being met via the target score achievement.

3. Discuss the ways in which your assessment results indicate that your student learning objectives are not being met. What actions will you take to strengthen these areas during this current academic year and how will they be assessed?

The process of continuous improvement collects data, uses the data to inform decisions and monitors the success of the improvement initiatives. Student outcomes whose assessment indicated the need for monitoring or change are shown below.

SO8: Recognition of the need for and an ability to engage in continuing professional development

Assessment Data: Assessment of project artifacts via the grading rubric CIS4462 and CIS4472 (Senior Capstone Course) showed some weakening over the last two years. Further, alumni seem to show the beginning of a trend of weakness. Discussion at the spring assessment meeting concluded students are more *unaware* of professional development activities they complete (journal reading, career fairs, presentations, guest speakers, etc.) as opposed to not making improvements and being professionally developed.

Analysis/Improvement: A greater emphasis will be placed on why these activities exist in the curriculum. Additional efforts will be made to communicate what constitutes professional development. In particular, three courses will specifically address this area:

- *CIS1001 (CIS Seminar):* This course contains a unit on professional development and will be reviewed for accuracy and efficacy of content.
- *CIS2013 (Systems Analysis and Design):* This course contains a theme of professional development, including required reading of current professional journals. This activity will be renamed and focused upon with regard to professional development.
- *CIS4462/72 (Senior Project Capstone):* As a final location just prior to graduation, students participate in a number of professional activities including resume' building and development, job search, career fair attendance, presentations, and the development of a professional quality software project.

The faculty will review the activities contributing to the satisfaction of this objective during the 2017-18 school year.

4. Do your findings indicate that the changes implemented during the last academic year were effective? *Provide data and explain.*

SO 2 continues to not reflect expected scores on the exit exam assessment. However, all other tools and assessment practices (three others) used to assess this outcome show strength. After several cycles of discussing whether this is a significant finding, the faculty have concluded the way the question is worded on the exit exam tends to produce weak answers rather than this being a true reflection of an underlying weakness in the curriculum.

SO 8 was weaker than expected last year (See SO 8 Table above) and faculty increased the number of professional activities available to students. This action clearly did not improve the score in any significant way. The faculty, therefore, have tentatively concluded that increasing communication regarding these activities is an additional effective step which can be taken.

SO 9 reflected a weaker score in 2014-15 than expected (See SO 9 Table above). As a result, CIS 4462-72 (capstone senior project) was modified to allow for and promote the use of more current tools and development practices (Agile/Scrum for example). Scores have risen above expected level following this change.

5. How were the findings in this report shared with department faculty?

All findings of this report were shared with department faculty in written and verbal form during the assessment meetings in the fall and spring of 2015-16 and are available electronically to all faculty members on a shared network drive. Some results included in this report from the 2016-17 school year were available and included as well.

6. Identify the ways in which the following have been made public for your students:

- **Program Goals and Objectives**
- **Assessment Requirements, and**
- **Assessment Results.**

The Department mission, vision and program goals (program learning objectives) and learning objectives (student outcomes) are published on the departmental website. This report as well as previous assessment reports are housed in the University Office of Institutional Research. Students may review the reports during normal hours of operation for that office. Students are also made aware of assessment requirements at three points during the curriculum. When students enter the program, they are provided with a copy of the student outcomes in the form of a baseline pretest. In reviewing for the final exam in CIS2213 (end of the sophomore year) students are informed that a portion of the exam will be used for assessment purposes. Students in CIS4472 (end of the senior year) are notified in a similar fashion.