Annual Goals for Math & Computer Science

2010-2011

Title: Gather student learning outcomes assessment data for the computer science major and begin to consider the implications of these data

Description: Goal - Gather student learning outcomes assessment data for the computer science major and begin to consider the implications of these data. The Computer Science Major Committee has implemented plans for assessing student learning outcomes in the CS major. This assessment plan is largely in compliance with ABET requirements.

Budget: 0.00

University Goals: 1

Strategic Goals: 184

Responsibility: Computer Science Major Committee Chair

Participation: Computer Science Major Committee

Results: Data for this academic year was collected and the report has been prepared. This report and the report for the previous academic year are both attached. It is clear from these data that CS majors performed well; however, opportunities for program improvement are implied for several of the student learning outcome assessments.

Actions: Professional writing will be addressed in the department's Quality Enhancement Plan.

Improvements: The Computer Science Major Committee will review and evaluate the student learning outcome data obtained to date.

Title: Gather student learning outcomes assessment data for the mathematics major and begin to consider the implications of these data

Description: Goal - Gather student learning outcomes assessment data for the mathematics major and begin to consider the implications of these data. The Mathematics Major Committee was charged (Memo of September 14, 2010) with continuing to gather student leaning outcomes assessment data for the mathematics major program. The committee was also been asked to begin to consider how these assessments might be used for improving our program.

Budget:	0.00

University Goals:	1

Strategic Goals:	186

Responsibility:	Department Chair

Participation:	Mathematics Major Committee

Results:	Data for this academic year was collected, and the report was prepared. This report is attached together with the report from the previous academic year. It is clear from these data that professional writing needs to be addressed.

Actions:	Professional writing will be addressed in the Department's Quality Enhancement Plan: Research Literacy.

Improvements:	None to date

Title:	Gather student learning outcomes assessment data for the Area III General Education Mathematics Component, analyze these data and report findings

Description:	Goal - Gather student learning outcomes assessment data for the Area III General Education Mathematics Component, analyze these data, and report findings. Oversight committees for MA 110 and MA 112 were charged (Memos of September 13, 2010) with continuing to conduct Area III student learning outcomes assessment in these courses. Data from the spring of 2009 through the fall of 2010 will be the basis for the department's assessment of student learning outcomes in general education mathematics. The associated report will be written during the spring of 2011. This report will include a data summary, an analysis of the data, a discussion of findings, and implications for program improvement.

Budget:	0.00

University Goals:	1

Strategic Goals:	182

Responsibility:	Department Chair

Participation:	MA 110 and MA 112 Oversight Committees

Results:	The report for 2010 has been written. This report and the report for 2009 are both attached. The reports for 2009 and 2010 will be reviewed by the MA 110 and MA 112 Oversight Committees. These reports should provide sufficient

baseline data to enable these Oversight Committees to evaluate student achievement with regard to General Education Component learning outcomes in mathematics.

Actions: None taken to date.

Improvements: The MA 110 and MA 112 Oversight Committees will review and evaluate the student learning outcome data obtained to date.

Title: Prepare to pursue ABET accreditation in computer science

Description: Goal - Make preparations to pursue ABET accreditation in computer science during the 2011-2012 academic year. The Computer Science Major Committee has implemented a plan for assessing student learning outcomes in the CS major that is largely in compliance with ABET requirements. The committee has also determined that the curriculum for the CS major is in compliance with ABET requirements. Dean Hansen has requested that accreditation endeavors be delayed pending the accumulation of learning outcomes data. During this year, student learning outcomes data will be gathered, analyzed, and considered for program improvement as a necessary first step in the accreditation application process.

Budget: 0.00

University Goals: 1

Strategic Goals: 184

Responsibility: Computer Science Major Committee Chair

Participation: Computer Science Major Committee

Results: A primary goal for this year was to lay the foundation for pursuing ABET accreditation in computer science; however, Dean Hansen advised the CS faculty to delay this endeavor pending an administrative decision on the future of the CS program. Administrative concerns about the lack of productivity and viability of the CS program have had a considerable effect on our CS faculty. More specifically, will the CS program be terminated or allowed to continue? Or will the CS program be folded into the UNA CIS program? Until the future of the CS program is clarified, further progress on this long term goal is unlikely.

Actions: The department has continued to gather student learning outcomes data; however, progress toward ABET accreditation has been stymied pending an administrative decision on the future of the CS program. In April, the administration invited a consultant to review our CS program and a report on, "The Future Viability, Productivity, and Growth of the University of North

Alabama Computer Science Department" (attached) was submitted. Given the many errors in this report and the fact that there is no University of North Alabama Computer Science Department, this endeavor was not very satisfactory.

Improvements:	None planned at this time

Title:	Conduct searches to fill several anticipated vacancies in the mathematics faculty
Description:	Conduct searches to fill several anticipated vacancies in the mathematics faculty. Two vacancies have already been identified and 3 or 4 additional vacancies are likely because of anticipated retirements. Our goal is to fill these positions with new faculty who will help to enhance our programs in pre-general studies and general studies mathematics service area, the post-general studies mathematics service area, and the mathematics major.
Budget:	0.00
University Goals:	1
Strategic Goals:	182,185
Responsibility:	Department Chair
Participation:	
Results:	Three vacancies have been filled to date, and a fourth vacancy may or may not be filled pending an administrative decision with regard to the future of the CS major. The vacancies that were created by the following retirements have been filled: Ms. Barbara Laubenthal, Dr. Eddy Brackin, and Dr. Phil Robinson. The vacancy created by Dr. Jean Henderson's retirement is still open. Dr. Henderson has usually taught three courses in computer science and two service courses in mathematics. Given that Dr. Henderson will no longer be teaching two mathematics service courses, that Dr. Robinson has taught a one course overload each semester, and that Ms. Laubenthal returned last year to serve for one year only as an adjunct faculty member, we simply do not have enough mathematics faculty members to cover the all of the mathematics service course sections that will need to be offered this fall.
Actions:	We expect that without at least one more mathematics faculty member, the department will have lost ground in the mathematics service area unless we can cover the shortfall with adjunct faculty and overloads. Furthermore, using adjunct faculty and overloads to make up the shortfall is at best a temporary fix, and program quality is apt to suffer. Consequently, we will continue to request additional mathematics faculty to meet student demand for

mathematics service area sections.

Improvements:

Student Learning Outcomes for Math

2010-2011

Title:	Ability to demonstrate an acceptable level of mastery of mathematical skills and concepts
Description:	Ability to demonstrate an acceptable level of mastery of mathematical skills and concepts. The Major Field Test (MFT) will be used to assess student mastery of mathematical skills and concepts.
Budget:	$0.00
Core Competencies:	1,2,3,4,5
25% Online:	
50% Online:	
Core Competencies:	1,2,3,4,5
How Often:	Every year
Assessed this Year?	Yes
Responsibility:	Department Chair
Participation:	Mathematics Major Committee
Direct Assessments	
	MFT

Indirect Assessments

Results: The Major Field Test (MFT) was used to assess student mastery of mathematical skills and concepts. MFT scores for students graduating between July 2010 and June 2011 were used in this assessment. The distribution of Mathematics MFT Exam scores was as follows: 2 students had scores of 152, 2 had scores of 149, 2 had scores of 137, and 1 scored 125. Careful comparison with the distribution of the norm population indicates that the distribution of scores for our students falls below the median of the norm population. On one hand, 4 out of 7 scores (57.1%) fell within a one-standard deviation interval (138 to 174) about the norm population mean. On the other hand, our limited norm population percentile information indicates that the 152 score is approximately the 40th percentile, the 149 score is approximately the 35th percentile, the 137 score is approximately the 10th percentile, and the 125 score falls below the 5th percentile. These considerations indicate that our mathematics majors are not performing as well as the norm population on average. (See attachments)

Curriculum: None to date. The Mathematics Major Committee will consider these findings during the fall of 2011.

Actions: None to date. The Mathematics Major Committee will consider these findings during the fall of 2011.

Improvements: None to date. The Mathematics Major Committee will consider these findings during the fall of 2011.

Title: Ability to communicate mathematical ideas with clarity and accuracy in a logical, well organized format

Description: Ability to communicate mathematical ideas with clarity and accuracy in a logical, well organized format. An assessment of this learning outcome will be conducted in MA 471W, Applied Mathematics. MA 471 is a course that includes an emphasis on writing. This course is a capstone course that is designed to draw upon a wide range of mathematical skills in the solution of applied problems. A well-defined writing assignment will be used to assess this learning outcome.

Budget: $0.00

Core 1

Competencies:

25% Online:

50% Online:

Core Competencies: 1

How Often: Every year

Assessed this Year? Yes

Responsibility: MA 471 Instructor

Participation: Mathematics Major Committee

Direct Assessments

Final Exam

Project Assessment

Indirect Assessments

Results: This learning outcome was assessed in MA 471W, Applied Mathematics, during the fall of 2010. MA 471 is a capstone course that is designed to draw upon a wide range of mathematical skills in the solution of applied problems. Since MA 471 also emphasizes writing skills, several writing assignments are typically included in the course. A well-defined writing assignment was used to assess this learning outcome. This assignment was constructed and assessed by the current instructor. The assessment was conducted using a six point rubric where students were scored on a 10-point scale. Assessments were conducted for each of the twelve students in this class with the following results: overall organization, average = 9.3; writing skills, average = 7.9; ability to explain and present the problem, average score = 8.3; ability to select proper mathematical tools, average = 9.7; ability to apply tools

correctly, average = 8.7; ability to present findings, average 7.8. (See attachments)

Curriculum:	None to date. The Mathematics Major Committee will consider these findings during the fall of 2011.
Actions:	None to date. The Mathematics Major Committee will consider these findings during the fall of 2011.
Improvements:	Professional writing skills will be addressed in the Department's Quality Enhancement Plan: Research Literacy.

Title:	Ability to apply inductive and/or deductive reasoning skills in the development of rigorous mathematical arguments
Description:	Ability to apply inductive and/or deductive reasoning skills in the development of rigorous mathematical arguments. MA 451, Introduction to Analysis, is the logical, senior-level course for embedded assessment of reasoning skills in the development of rigorous mathematical arguments. Well-defined assignments or exam items where each student develops his/her own mathematical proofs will be used to assess this learning outcome.
Budget:	$0.00
Core Competencies:	2,4
25% Online:	
50% Online:	
Core Competencies:	2,4
How Often:	Every year
Assessed this Year?	Yes
Responsibility:	MA 451 Instructor
Participation:	Mathematics Major Committee
Direct Assessments	
	Final Exam

**Indirect
Assessments**

Results: MA 451, Introduction to Analysis, is the logical, senior-level course for embedded assessment of reasoning skills in the development of rigorous mathematical arguments. An assessment was conducted during the spring of 2011. A well-defined exam item where each student developed his/her own mathematical proof was used to assess this learning outcome. This item was constructed and assessed by the current instructor. (See attachments) Enrollment in the spring of 2011 consisted of fifteen students. Five of the fifteen students scored 100% on the test item while four scored 90%, two scored 80%, one score 50%, one scored 20% and two made no attempt. A problem similar to this one had been done in class by one of the students. The test question was made moderately different in order to keep students from simply memorizing a proof word for word. This was done in an effort to see which students could understand the idea of the proof as well as present this idea properly in his/her own words. Students who have scored 20% or less on the problem have either been historically weak mathematics students who may have transferred in several of the fundamental mathematics courses or students who have not taken very many of the upper level (theoretical) mathematics courses prior to taking this class.

Curriculum: None to date. The Mathematics Major Committee will consider these findings during the fall of 2011.

Actions: None to date. The Mathematics Major Committee will consider these findings during the fall of 2011.

Improvements: None to date. The Mathematics Major Committee will consider these findings during the fall of 2011.

Title: Ability to draw upon a wide range of mathematical skills in the solution of applied problems

Description: Ability to draw upon a wide range of mathematical skills in the solution of applied problems. MA 471W, Applied Mathematics, is a natural course for assessing the abilities of undergraduate mathematics majors to apply a wide range of mathematical skills in developing one or more solutions to applied problems. Individual student performance on applied problems including

exam items and/or other assignments will be the basis for assessing this learning outcome.

Budget:	$0.00
Core Competencies:	2,4,5
25% Online:	
50% Online:	
Core Competencies:	2,4,5
How Often:	Every year
Assessed this Year?	Yes
Responsibility:	MA 471 Instructor
Participation:	Mathematics Major Committee
Direct Assessments	
	Final Exam
	Project Assessment
Indirect Assessments	
Results:	MA 471W, Applied Mathematics, is a natural course for assessing this learning outcome. An assessment of individual student performance on one applied problem was the basis for assessing this learning outcome. This assessment was conducted by the current instructor during the fall of 2010. The assessment was conducted using a five-point rubric where students were scored on a 10-point scale. Assessments were conducted for each of the twelve students in this class with the following results: ability to analyze

situation, average = 10.0; ability to find maximal cliques for graph, average = 10.0; ability to construct correct bar graph, average score = 10.0; ability to develop and to solve linear programming problem, average = 9.0; ability to analyze and to summarize findings, average = 4.1. (See attachments)

Curriculum: None to date. The Mathematics Major Committee will consider these findings during the fall of 2011.

Actions: None to date. The Mathematics Major Committee will consider these findings during the fall of 2011.

Improvements: None to date. The Mathematics Major Committee will consider these findings during the fall of 2011.

Student Learning Outcomes for Computer Science

2010-2011

Title: Ability to analyze a problem, and identify and define the computing requirements appropriate to its solution

Description: An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution. CS 455, Software Engineering, is the logical, senior-level course for embedded assessment of students' ability to analyze a problem, and identify and define the computing requirements appropriate to its solution. Well-defined assignments where students develop their ability to work on large problems will be used to assess this learning outcome.

Budget: $0.00

Core Competencies: 2,3,4

25% Online:

50% Online:

Core Competencies: 2,3,4

How Often:	Every year
Assessed this Year?	Yes
Responsibility:	CS 455 Instructor
Participation:	Computer Science Major Committee
Direct Assessments	
	well-defined assignments
Indirect Assessments	
Results:	In the spring of 2011, a large, real-life problem which could be used to benefit other CS classes (especially CS 310) was assigned to the CS 455 class for the team project. The team consisted of five students working the entire semester on the project. This project was further subdivided into two smaller teams of size two and three which integrated their work into one application. The team's ability to analyze the problem and identify the requirements was assessed by two computer science faculty members (James Jerkins and Patricia Roden) through the comparison of the specification document submitted to the professor of the course relative to the actual requirements of the problem. It was determined that seven out of ten major requirements were discovered and reported in the programming team's specification document. Since this project was extremely complex but the area of application was familiar, the student performance was rated as good.
Curriculum:	The results were discussed with the entire Computer Science faculty and assignments are being considered which will demand of the students more requirement discovery.
Actions:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.
Improvements:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Title:	Ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs
Description:	An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs. CS 455, Software Engineering, is the logical, senior-level course for embedded assessment of students' ability to design, implement, and evaluate a computer-based system, process, component or program to meet defined needs. Well-defined assignments where students develop their ability to design, implement, and evaluate such systems will be used to assess this learning outcome.
Budget:	$0.00
Core Competencies:	2,3,4
25% Online:	
50% Online:	
Core Competencies:	2,3,4
How Often:	Every year
Assessed this Year?	Yes
Responsibility:	CS 455 Instructor
Participation:	Computer Science Major Committee
Direct Assessments	
	well-defined assignments
Indirect Assessments	
Results:	The programming project assignment given to the five member programming team in the CS 455 class was presented to and analyzed by the professor of

the course, Patricia Roden and James Jerkins who was familiar with the real-life problem for which the project was designed. The programming team made a formal presentation at the end of the course with a demonstration of the actions of the project relative to all of the stated requirements. The team also presented all documents generated during the development process including the specification document, the design document, the source code, all team communications, all team meeting minutes, all client meeting minutes, and a time log for each person. A checklist created from the specification document along with the description of the project was used to analyze the success of the team. For the most part, the team created a correctly working application which had a few features missing and will be given to another team to complete. This development process required the students to make use of many different programming techniques, programming language features, algorithmic techniques and several different software tools in the completion of the project. The difficulty of the scope of the project along with some team member conflicts resulted in a project which was deficient in only a few aspects but in spite of these difficulties, the students performed above average relative to this outcome.

Curriculum:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.
Actions:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.
Improvements:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Title:	Ability to apply knowledge of computing and mathematics appropriate to the discipline
Description:	An ability to apply knowledge of computing and mathematics appropriate to the discipline. The Major Field Test (MFT) will be used to assess students' ability to apply knowledge of computing and mathematics. Performance on this test will be correlated with the CS GPA and Math GPA to investigate the extent to which these measures are in concordance.
Budget:	$0.00
Core Competencies:	1,2,3,4,5
25% Online:	
50% Online:	
Core Competencies:	1,2,3,4,5

How Often:	Every year
Assessed this Year?	Yes
Responsibility:	Department Chair
Participation:	Computer Science Major Committee
Direct Assessments	
	MFT
Indirect Assessments	
Results:	The Major Field Test (MFT) was used to assess students' ability to apply knowledge of computing and mathematics. MFT scores for the four CS students who took the exam during the 2010-2011 academic year were used for this assessment. The associated distribution of Computer Science MFT Exam scores was as follows: 1 student had a score of 164, 1 student had a score of 159, and 2 students had scores of 149. Careful comparison with the distribution of the norm population indicates that all of our students scored above the median of the norm population. Our limited norm population percentile information indicates that the 164 score is approximately the 75th percentile, the 159 score is approximately the 70th percentile, and the 149 scores are located at approximately the 50th percentile. Thus, our students scored at or above the median score for the norm population. (See attachments)
Curriculum:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.
Actions:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.
Improvements:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Title:	Ability to analyze the local and global impact of computing on individuals, organizations, and society
Description:	An ability to analyze the local and global impact of computing on individuals, organizations, and society. The local and global impact of computing on individuals, organizations, and society is discussed in a variety of courses including CS 155, 255, 355, 410, 455, and 470. A well-defined discussion question will be developed to determine the students' ability related to this outcome.
Budget:	$0.00
Core Competencies:	4
25% Online:	
50% Online:	
Core Competencies:	4
How Often:	Every year
Assessed this Year?	Yes
Responsibility:	CS 155 and CS 455 Instructors
Participation:	Computer Science Major Committee
Direct Assessments	
	well-defined discussion question
Indirect Assessments	
Results:	The instructor for CS 470, Artificial Intelligence, constructed a set of questions related to the local and global impact of computing on individuals, organizations, and society. An assessment rubric was also created for this set

of questions. These questions and rubric were presented to the entire computer science faculty for approval. In the spring of 2011, two of the questions were presented for discussion during two separate class meetings of CS 470. Students discussed the questions and articulated both positive impacts and negative influences that computing is having on society. The students gave concrete examples of the benefits such as how pro-democracy movements were utilizing computing technology and the misuse of computing technology to quell dissent by governments. The discussion also included the impact of computing on medicine, ethics, and the economy in contemporary society. Students acknowledged their roles in promoting beneficial uses of technology and advocating an informed dialogue about the social implications of computing in an evolving information age. After each class period where these issues where discussed, the course instructor reviewed the questions and responses with respect to the assessment rubric. The rubric lists four criteria classes for evaluating student responses and assigns values ranging between zero and three for each response. Students were able to identify many, but not all, of the relevant factors during their discussions. Responses indicated the students had a general understanding of the influences of computing on society, but they were unable to articulate a clear and accurate analysis. Finally, students could not identify all of the stakeholders (cultural, social, political, economic, moral, and ethical) and concisely describe the conflicts of interest between various parties. These results were shared with the entire computer science faculty.

Curriculum:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.
Actions:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.
Improvements:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Title:	Ability to function effectively on teams to accomplish a common goal
Description:	An ability to function effectively on teams to accomplish a common goal. CS 455, Software Engineering, is the logical, senior-level course for embedded assessment of students' ability to work effectively on teams. Well-defined assignments where students develop their ability to work on teams will be used to assess this learning outcome.
Budget:	$0.00
Core Competencies:	1,2,3,4,5
25% Online:	

50% Online:

Core Competencies:	1,2,3,4,5
How Often:	Every year
Assessed this Year?	Yes
Responsibility:	CS 455 Instructor
Participation:	Computer Science Major Committee

Direct Assessments

well-defined assignments

Indirect Assessments

Results: The ability to function effectively on a team was measured by two methods: Two different surveys administered at the end of the project and completed by each student on the programming team and by the observations of two computer science faculty members (James Jerkins and Patricia Roden). Each team member completed a survey with regard to each of their teammates. In this survey they analyzed the contributions each team member made to the project, what percentage of the project they completed, whether their work was completed successfully and whether their work was completed in a timely fashion on schedule. The survey also asked for the strengths and weaknesses of the team member as well as whether the team member took charge too much or simply followed others' directions. The student was asked to give a letter grade for each teammate and justify that grade. Each team member also answered a personal survey concerning their effectiveness on the team, their strengths, their weaknesses, how much time they spent on the project, whether they felt the task were fairly distributed, whether they felt the team was appropriate size, what they felt they learned from the team project, and what they would do differently on their next team project. The results of the surveys indicated there were some problems with team

dynamics. These problems were detected early in the semester and resulted in the five person team project being subdivided into a team of size three and a team of size two with their results integrated into one final application. All the team members indicated that there was a conflict of personalities between two students which resulted in the need to divide the team. The team of size two each gave their teammate an evaluation of A. The team of size three which had one team member who went several days without communicating had one A, four B's and one C given. Each of the team members indicated that they realized that there had been too much procrastination early in the semester which contributed to the lack of completion of the entire functionality of the project. They did however indicate that there were several things about the project for which they were proud and with one exception all the team members indicated that they would be willing to work with the others on another project.

Curriculum:	CS 455 will be modified to incorporate the team concept/presentation dynamic earlier and to limit team size to at most four students.
Actions:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.
Improvements:	None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Title:	Understanding of professional, ethical, legal, security and social issues and responsibilities
Description:	An understanding of professional, ethical, legal, security and social issues and responsibilities. The professional, ethical, legal, security, and social responsibilities of computer science professionals are taught in a variety of courses including CS 155, 255, 355, 410, and 455. Well-defined questions will be used to determine the students' level of understanding related to this outcome.
Budget:	$0.00
Core Competencies:	1,3
25% Online:	
50% Online:	
Core Competencies:	1,3
How Often:	Every year
Assessed this	Yes

Year?

Responsibility: CS 155 and CS 455 Instructors

Participation: Computer Science Major Committee

**Direct
Assessments**

well-defined questions

**Indirect
Assessments**

Results: A series of questions related to ethics, security, social issues and responsibilities were constructed. This survey was piloted to a small group of students. These results will be evaluated and the survey improved to obtain appropriate results. After modification and approval from a group of faculty, the survey will be administered to each CS 155 class and then administered again to these students when they take CS 455.

Curriculum: None to date. The Computer Science Major Committee will continue this assessment process during the next academic year.

Actions: None to date. The Computer Science Major Committee will continue this assessment process during the next academic year.

Improvements: None to date. The Computer Science Major Committee will continue this assessment process during the next academic year.

Title: Ability to communicate effectively with a range of audiences

Description: An ability to communicate effectively with a range of audiences. CS 410, Programming Languages, is the logical, senior-level course for embedded assessment of students' ability to communicate effectively. A well-defined assignment where students develop their oral and written communication skills will be used to assess this learning outcome.

Budget: $0.00

Core   1

Competencies:	
25% Online:	
50% Online:	
Core Competencies:	1
How Often:	Every year
Assessed this Year?	Yes
Responsibility:	CS 410W Instructor
Participation:	Computer Science Major Committee
Direct Assessments	
	well-defined assignment
Indirect Assessments	
Results:	In the fall of 2010 the students in the CS 410 Programming Languages class were assigned and prepared a large, detailed research project analyzing the features of a specific programming language. The students were given a list of topics which must be addressed in the research as a minimum. The students were required to present this research in written as well as oral form. A formal research paper summarizing their analysis was required. The paper was graded on coverage of the required topics along with the grammatical structure. The students were also required to have a power point presentation as well as handouts outlining their research for the other members of the class. The research project grade represented twenty percent of the course grade. There were four students which completed the project with an average score of fourteen percent. The majority of the points which were deducted were results of grammar errors. However, two students were lacking in the addressing of the topics required. The computer science faculty members were invited to the presentations if they were available. The students in the

CS 410 class were also required to answer a variety of discussion questions on their midterm and final exams in which they were graded on content, structure and grammar. The average for these tests was eighty percent.

Curriculum: None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Actions: None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Improvements: None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Title: An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems

Description: An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. The Major Field Test (MFT) will also be used to assess students' ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. Performances on these tests will be correlated with the CS and Math GPA to investigate the extent to which these measures are in concordance.

Budget: $0.00

Core Competencies: 2,4,5

25% Online:

50% Online:

Core Competencies: 2,4,5

How Often: Every year

Assessed this Year? Yes

Responsibility: Department Chair

Participation: Computer Science Major Committee

Direct

Assessments

                        MFT

**Indirect
Assessments**

Results: As in Learning Outcome 1, MFT exam scores were correlated with the CS major courses only gpa, the prescribed math courses only gpa, and the regular CS gpa (CS major courses plus prescribed math courses) to investigate the extent to which these measures are in concordance. The resulting analysis has reinforced our perception of the overall integrity of the computer science major program. For convenience, the correlation analysis that was presented in conjunction with learning outcome 1 is repeated below. An additional analysis of the computer science MFT data was undertaken to relate MFT scores and gpa's in the CS major courses, prescribed mathematics courses, and CS major courses and prescribed mathematics courses combined. This analysis yielded the following Pearson Product-Moment Correlation Coefficients: MFT score versus gpa in CS major courses (correlation coefficient = .86530, p-value > .10), MFT versus gpa in prescribed mathematics courses (correlation coefficient = .6782, p-value > .10), and MFT score versus regular CS gpa (correlation coefficient = .6645, p-value >.10). Since the correlation analysis reported above was based on only four observations, it should be noted that a sample correlation coefficient greater than 0.77 would be required for significance at the .05 level. In any event, the observed correlations may still suggest a high degree of concordance between MFT exam scores and each of three other measures of student success in the CS major program. Associated data are presented below in ordered 4-tuples based on (MFT Score, CS Major Courses Only gpa, Prescribed Mathematics gpa, and Regular CS gpa Data): (149, 2.14, 2.79, 2.30), (149, 3.43, 3.14, 3.36), (159, 3.14, 3.29, 3.18), and (164, 3.86, 3.21, 3.70).

Curriculum: None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Actions: None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Improvements: None to date. The Computer Science Major Committee will consider these

findings during the fall of 2011.

Title:	Recognition of the need for and an ability to engage in continuing professional development
Description:	Recognition of the need for and an ability to engage in continuing professional development. The need for and ability to engage in continuing professional development is discussed in a variety of courses including CS 155, 255, 355, 410, and 455. Well-defined questions will be used to determine the students' ability related to this outcome.
Budget:	$0.00
Core Competencies:	5
25% Online:	
50% Online:	
Core Competencies:	5
How Often:	Every year
Assessed this Year?	Yes
Responsibility:	CS 155 and CS 455 Instructors
Participation:	Computer Science Major Committee
Direct Assessments	

well-defined questions

Indirect Assessments

Results: The survey related to the need for and ability to engage in continuing

professional development has been created and will be reviewed in the fall by the entire computer science faculty. The survey will then administered to the CS 155 class and later administered to the same students when they are in the CS 455 class with their results statistically compared.

Curriculum: None to date. The Computer Science Major Committee will continue this assessment process during the next academic year.

Actions: None to date. The Computer Science Major Committee will continue this assessment process during the next academic year.

Improvements: None to date. The Computer Science Major Committee will continue this assessment process during the next academic year.

Title: Ability to use current techniques, skills, and tools necessary for computing practice

Description: An ability to use the current techniques, skills, and tools necessary for computing practice. CS 455, Software Engineering, is the logical, senior-level course for embedded assessment of students' ability to use current techniques, skills and tools necessary for computing practice. Well-defined assignments where students develop their ability to use current techniques, skills and tools will be used to assess this learning outcome.

Budget: $0.00

Core Competencies: 2,3,4

25% Online:

50% Online:

Core Competencies: 2,3,4

How Often: Every year

Assessed this Year? Yes

Responsibility: CS 455 Instructor

Participation: Computer Science Major Committee

Direct Assessments

well-defined assignment

**Indirect
Assessments**

Results: CS 455, Software Engineering, is the logical, senior-level course for embedded assessment of students' ability to use current techniques, skills, and tools necessary for computing practice. Well-defined assignments where students develop their ability to use current techniques, skills and tools will be used to assess this learning outcome. A committee of tenured faculty, likely to include the current instructor, who are normally involved in teaching CS majors will jointly plan assessment methodology and assess this learning outcome. An assessment of this learning outcome will occur each year during the spring term. The programming project completed by the five member programming team (using two sub-teams) in CS 455 in the spring of 2011 was analyzed by two computer science faculty (James Jerkins and Patricia Roden) related to the use of techniques and tools necessary for computing practices. The programming team used a variety of tools including compilers, version control software, and presentation software. The teams also used tools for sharing documents, keeping time logs and preparing formal documents. A team secretary was responsible for the compilation of several documents including a specification document, design document, all team emails, all team meeting minutes, all client meeting minutes, the source code and the user's manual. This team presented a more organized method of document control than any previous teams. Because of the use of online methods of communicating, less physical team meetings were required.

Curriculum: None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Actions: None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.

Improvements: None to date. The Computer Science Major Committee will consider these findings during the fall of 2011.