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University of North Alabama

Department of Computer Science and Information Systems

Computer Science Program – SLO 7A

2011-2012 Assessment of Student Learning Outcomes

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Date Reported: 07/17/2012

Student Learning Outcome F: An ability to communicate effectively with a range of audiences.

Evaluation Period: Spring 2012

Evaluation Contact: Learning Outcome F Coordinator

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Assessment Results:

Three evaluators, none of whom served as the instructor for CS 455, evaluated the communication effectiveness of students taking CS 455 in spring 2012. A rubric obtained from Read-Write-Think was used to evaluate the students for this outcome. The students were evaluated based upon nonverbal skills, verbal skills, and content. There were 4 students evaluated. The rubric description and the summarized data collected from the evaluators can be found in the attached files. Overall, the students performed above average in the areas evaluated. We found the students were weakest in the nonverbal skills of body language and poise. A comment was additionally made by reviewers that students should improve on the introduction of their work based upon the potential variety in an audience. Some members of the audience would have benefited by hearing a better overall description of the project before details of the project were given.

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Action Plans:

Action Plan #1:

Students in CS 455 were allowed to practice their presentation in front of their peers and instructor. In addition to this during the Spring 2012 semester, students will be given a rubric with which to evaluate each other. The rubric will contain information on judging body language and poise.

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University of North Alabama

Department of Computer Science and Information Systems

Computer Science Program – SLO 7

2011-2012 Assessment of Student Learning Outcomes

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Date Reported: 09/04/2012

Student Learning Outcome F: An ability to communicate effectively with a range of audiences.

Evaluation Period: Fall 2011

Evaluation Contact: Learning Outcome F Coordinator

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#### Assessment Results:

Students taking CS 355 were asked to complete a portfolio with implementations of various abstract data types. For each ADT constructed, students answered analysis questions regarding their implementations. One of the analysis questions was evaluated by CS faculty using a rubric created to rate a student's written communication skills. The rubric rated the student in three areas: justification of answer, grammar and sentence structure, and technical content and clarity. For each of these areas, a student was rated from 1 to 4, 1 being weak and 4 being strong. The average scores are listed below:

Justification of answer: 2.14

Grammar and sentence structure: 1.71

Technical content and clarity: 1.71

Based upon the rubric, we would like for our students to have, at a minimum, the capabilities listed in columns 3 and 4. The averages above show a need for improvement articulating concepts in our field.

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#### Action Plans:

##### Action Plan #1:

In CS 355, provide student with clear expectations of writing skills.

##### Action Plan #2:

In CS 355, give specific feedback to students when writing skills are lacking.

##### Action Plan #3:

When students show continued trouble, send the student to visit the UNA Writing Center.

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University of North Alabama

Department of Computer Science and Information Systems

Computer Science Program – SLO 8A

2011-2012 Assessment of Student Learning Outcomes

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Date Reported: 07/17/2012

Student Learning Outcome J: 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.

Evaluation Period: Fall 2011

Evaluation Contact: Learning Outcome J Coordinator

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**Assessment:**

Students taking CS 355 were asked to complete a portfolio with implementations of various abstract data types. For each ADT constructed, students answered analysis questions regarding their implementations. One of the analysis questions asked the students to make a decision between two ADTs based upon some scenario. The students were asked to choose an ADT and justify their answers.

A CS professor evaluated the answers to the question based upon a rubric. Seven student papers were judged. Based upon a scale of 1 to 4, 1 being weak and 4 being strong, the students scored 1.7. This is below par and should be improved. This set of answers was also judged for effective written communication where low scores were also received. In our judgment, the students are not constructing a cohesive answer based upon the information they are learning.

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**Action Plans:**

Action Plan #1:

See action plans for Learning Outcome F-2

Action Plan #2:

In CS 355, after feedback is given from the grading of the analysis questions, ask students to participate in a discussion. Encourage students to discuss tradeoffs and fully describe their positions.

Action Plan #3:

Add analysis questions in CS 155 and in CS 255 following project assignments to provide feedback for understanding as well as provide a place for our program to begin encouraging.

# University of North Alabama

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Department of Computer Science and Information Systems

Computer Science Program – SLO 8B

2011-2012 Assessment of Student Learning Outcomes

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Date Reported: 07/17/2012

Student Learning Outcome J: 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.

Evaluation Period: Fall 2011

Evaluation Contact: Learning Outcome J Coordinator

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## Assessment:

Students taking CS 311 were given an exam question asking them to compare and contrast Central Processing Units.

A CS professor evaluated the answers to the question based upon a rubric (see attached). Seven student papers were judged. Based upon a scale of 1 to 4, 1 being weak and 4 being strong, the students scored 1.1. We would expect an average score of 2.5.

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## Action Plans:

### Action Plan #1:

In all classes, provide specific written feedback to students when written communication is the key vehicle for testing a concept.

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University of North Alabama

Department of Computer Science and Information Systems

Computer Science Program

2011-2012 Assessment of Student Learning Outcomes

SLO 3

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Date Reported: 09/04/2012

Student Learning Outcome A: An ability to apply knowledge of computing and mathematics appropriate to the discipline.

Evaluation Period: Spring 2012

Evaluation Contact: Learning Outcome A Coordinator

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Assessment:

Completion of the Major Field Test (MFT) for computer science is a requirement for all graduating seniors at the University of North Alabama. During the 2011-2012 year, two students completed the exam. Out of 9095 exam participants, there was a mean of 149.1, median of 148.0, with a standard deviation of 16.1. The seniors scored 156 and 151 which fall at the 64<sup>th</sup> and 54<sup>th</sup> percentiles respectively. Students are expected to perform, at a minimum, above the 50<sup>th</sup> percentile.

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Action Plans:

Action Plan #1:

A decision was made by the CS faculty and chair to remove the MFT requirement for graduating seniors. The test scores did not provide data useful in determining specifically how the program could be improved.

# Student Learning Outcomes for Computer Science

2011-2012

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**Outcome 1:** 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

**Core Competencies Supported:** 2,3,4

**Assessed How Often:** Every 2 years

**Assessed this Year?** No

**Responsibility:** Learning Outcome Coordinator

**Participation:** CS Faculty

**Direct Assessments**

CS 355/CS 455

**Indirect Assessments**

**Results:**

**Curriculum**

**Actions/Improvements:**

**Other**

**Actions/Improvements:**

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**Outcome 2:** 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

**Core Competencies Supported:** 2,3,4

**Assessed How Often:** Every 2 years

**Assessed this Year?** No

**Responsibility:** Learning Outcome Coordinator

**Participation:** CS Faculty

**Direct Assessments**

CS 355/CS 455

**Indirect Assessments**

**Results:**

**Curriculum**

**Actions/Improvements:**

**Other**

**Actions/Improvements:**

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<b>Outcome 3:</b>	Ability to apply knowledge of computing and mathematics appropriate to the discipline
<b>Description:</b>	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.
<b>Budget:</b>	\$0
<b>Core Competencies Supported:</b>	1,2,3,4,5
<b>Assessed How Often:</b>	Every 2 years
<b>Assessed this Year?</b>	Yes
<b>Responsibility:</b>	Learning Outcome Coordinator
<b>Participation:</b>	CS Faculty
<b>Direct Assessments</b>	
	MFT
<b>Indirect Assessments</b>	
<b>Results:</b>	Completion of the Major Field Test (MFT) for computer science is a requirement for all graduating seniors at the University of North Alabama. During the 2011-2012 year, two students completed the exam. Out of 9,095 exam participants, there was a mean of 149.1, median of 148.0, with a standard deviation of 16.1. The seniors scored 156 and 151 which fall at the 64th and 54th percentiles respectively. Students are expected to perform, at a minimum, above the 50th percentile.
<b>Curriculum Actions/Improvements:</b>	
<b>Other</b>	A decision was made by the CS faculty and chair to remove the

**Actions/Improvements:** MFT requirement for graduating seniors. The test scores did not provide data useful in determining specifically how the program could be improved.

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**Outcome 4:** 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

**Core Competencies Supported:** 4

**Assessed How Often:** Every 2 years

**Assessed this Year?** No

**Responsibility:** Learning Outcome Coordinator

**Participation:** CS Faculty

**Direct Assessments**

CS 410/CS 420

**Indirect Assessments**

**Results:**

**Curriculum**

**Actions/Improvements:**

**Other**

**Actions/Improvements:**

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**Outcome 5:** 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

**Core Competencies Supported:** 1,2,3,4,5

**Assessed How Often:** Every 2 years

**Assessed this Year?** No

**Responsibility:** Learning Outcome Coordinator

**Participation:** CS Faculty

**Direct Assessments**

CS 355/CS 455

**Indirect Assessments**

**Results:**

**Curriculum  
Actions/Improvements:**

**Other  
Actions/Improvements:**

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**Outcome 6:** 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  
**Core Competencies Supported:** 1,3  
**Assessed How Often:** Every 2 years  
**Assessed this Year?** No  
**Responsibility:** Learning Outcome Coordinator  
**Participation:** CS Faculty

**Direct Assessments**

CS 410/CS 420

**Indirect Assessments**

**Results:**

**Curriculum  
Actions/Improvements:**

**Other  
Actions/Improvements:**

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**Outcome 7:** 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

**Core Competencies Supported:** 1

**Assessed How Often:** Every year  
**Assessed this Year?** Yes  
**Responsibility:** SLO 6 Coordinator  
**Participation:** SLO 6 Review Team  
**Direct Assessments**

MFT

Capstone Project for CS 455

### **Indirect Assessments**

**Results:** The students were evaluated based upon nonverbal skills, verbal skills, and content. There were 4 students evaluated. The rubric description and the summarized data collected from the evaluators can be found in the attached files. Overall, the students performed above average in the areas evaluated. We found the students were weakest in the nonverbal skills of body language and poise. A comment was additionally made by reviewers that students should improve on the introduction of their work based upon the potential variety in an audience. Some members of the audience would have benefited by hearing a better overall description of the project before details of the project were given. Students taking CS 355 were asked to complete a portfolio with implementations of various abstract data types. For each ADT constructed, students answered analysis questions regarding their implementations. One of the analysis questions was evaluated by CS faculty using a rubric created to rate a student's written communication skills. The rubric rated the student in three areas: justification of answer, grammar and sentence structure, and technical content and clarity. For each of these areas, a student was rated from 1 to 4, 1 being weak and 4 being strong. The average scores are listed below: Justification of answer: 2.14 Grammar and sentence structure: 1.71 Technical content and clarity: 1.71 Based upon the rubric, we would like for our students to have, at a minimum, the capabilities listed in columns 3 and 4. The averages above show a need for improvement articulating concepts in our field.

**Curriculum  
Actions/Improvements:** No curriculum changes were made.

**Other  
Actions/Improvements:** Students in CS 455 were allowed to practice their presentation in front of their peers and instructor. In addition to this during the Spring 2012 semester, students will be given a rubric with which to evaluate each other. The rubric will contain information on judging body language and poise. Pertaining to CS 355 (1) we plan to provide students with clear expectations of writing skills; (2) give specific feedback to students when writing skills are lacking; and (3) when students show continued trouble, send the student to visit the UNA Writing Center

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**Outcome 8:** 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

**Core Competencies  
Supported:** 2,4,5

**Assessed How Often:** Every 2 years

**Assessed this Year?** Yes

**Responsibility:** Learning Outcome Coordinator

**Participation:** CS Faculty

**Direct Assessments**

CS 311

CS 355

## Indirect Assessments

### Results:

Students taking CS 355 were asked to complete a portfolio with implementations of various abstract data types. For each ADT constructed, students answered analysis questions regarding their implementations. One of the analysis questions asked the students to make a decision between two ADTs based upon some scenario. The students were asked to choose an ADT and justify their answers. A CS professor evaluated the answers to the question based upon a rubric. Seven student papers were judged. Based upon a scale of 1 to 4, 1 being weak and 4 being strong, the students scored 1.7. This is below par and should be improved. This set of answers was also judged for effective written communication where low scores were also received. In our judgment, the students are not constructing a cohesive answer based upon the information they are learning. Students taking CS 311 were given an exam question asking them to compare and contract Central Processing Units. A CS professor evaluated the answers to the question based upon a rubric (see attached). Seven student papers were judged. Based upon a scale of 1 to 4, 1 being weak and 4 being strong, the students scored 1.1. We would expect an average score of 2.5.

### Curriculum

#### Actions/Improvements:

#### Other

#### Actions/Improvements:

Actions include: (1) In CS 355, provide student with clear expectations of writing skills, give specific feedback to students when writing skills are lacking, and when students continue to show trouble, send the student to visit the UNA Writing Center; (2) In CS 355, after feedback is given from the grading of the analysis questions ask students to participate in a discussion. Encourage students to discuss tradeoffs and fully describe their positions; and (3) add analysis questions in CS 155 and CS 255 following project assignments to provide feedback for understanding as well as provide a place for our program to begin encouraging. In all classes, provide specific written feedback to students when written communication is the key vehicle for testing a concept.

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### Outcome 9:

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  
**Core Competencies Supported:** 5  
**Assessed How Often:** Every 2 years  
**Assessed this Year?** No

**Responsibility:**

**Participation:**

**Direct Assessments**

**Indirect Assessments**

ACM participation

**Results:**

**Curriculum  
Actions/Improvements:**

**Other  
Actions/Improvements:**

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**Outcome 10:** 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

**Core Competencies Supported:** 2,3,4

**Assessed How Often:** Every 2 years

**Assessed this Year?** No

**Responsibility:** Learning Outcome Coordinator

**Participation:** CS Faculty

**Direct Assessments**

CS 455

**Indirect Assessments**

**Results:**

**Curriculum  
Actions/Improvements:**

**Other  
Actions/Improvements:**