Program Outcome (Stated in Measurable Terms)	Assessment Methods	Results (Data summary and analysis)
a) Demonstrate proficiency in foundation areas of Computer Science including discrete structures, logic, formal languages and automata.	**1. Discrete Structures and Logic** <u>Assessment Activity</u>: Course-embedded assessment via examination questions in Discrete Mathematics (MAD 2104). (See Appendix D). <u>Sample</u>: All students completing MAD 2104 in one section per year. <u>Minimum Criteria for Success</u>: Each multiple choice question will be answered correctly by at least 75% of students. **2. Formal Languages and Automata** <u>Assessment Activity</u>: Course-embedded assessment via examination questions in Theory of Algorithms (MAD 3512). (See Appendix D). <u>Sample</u>: All students completing MAD 3512 in one section per year. <u>Minimum Criterion for Success</u>: Each multiple choice question will be answered correctly by at least 75% of students.	<u>Fall 2010</u> (Summary: Appendix A, Analysis: pg5) <u>Spring 2011</u> (Summary: Appendix B, Analysis: pg 5, Evaluation: pg 9)

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Program Outcome (Stated in Measurable Terms)	Assessment Methods	Results (Data summary and analysis)
b) Demonstrate proficiency in various areas of Computer Science including data structures and algorithms, concepts of programming languages and computer systems. *(continued on following page)*	1. **Data Structures and Algorithms** Assessment Activity: Course-embedded assessment via examination questions in Data Structures (COP 3530). (See Appendix D). Sample: All students completing COP 3530 in one section per year. Minimum Criterion for Success: Each multiple choice question will be answered correctly by at least 75% of students. 2. **Concepts of Programming Languages** Assessment Activity: Course-embedded assessment via examination questions in Programming Languages (COP 4555). (See Appendix D). Sample: All students completing COP 4555 in one section per year. Minimum Criterion for Success: Each multiple choice question will be answered correctly by at least 75% of students.	Spring 2011 (Summary: Appendix B, Analysis: pg 5, Evaluation: pg 9) Fall 2010 (Summary: Appendix A, Analysis: pg 5, Evaluation: pg 9)

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Program Outcome (Stated in Measurable Terms)	Assessment Methods	Results (Data summary and analysis)
(Outcome (b) continued). *(continued on following page)*	**3. Computer Systems** Assessment Activity: Course-embedded assessment via examination questions in Database Management (COP 4710). (See Appendix D). Sample: All students completing COP 4710 in one section per year. Minimum Criterion for Success: Each multiple choice question will be answered correctly by at least 75% of students. Assessment Activity: Course-embedded assessment of project artifacts in Operating Systems (COP 4610) via the *Computer Systems Operating Systems* rubric. (See Appendix B). Sample: All completed COP 4610 projects in one section per year. Minimum Criterion for Success: At least 75% of projects assessed will be scored at 75% (9 of 12) or better. Assessment Activity: Course-embedded assessment of project artifacts in Programming III (COP 4338) via the *Computer Systems Multithreading* rubric. (See Appendix B). Sample: All completed COP 4338 projects in one semester per year. Minimum Criterion for Success: At least 75% of projects assessed will be scored at 75% (9 of 12) or better.	Spring 2011 (Summary: Appendix B, Analysis: pg 5, Evaluation: pg 9) Spring 2011 (Summary: Appendix B, Analysis: pg 5, Evaluation: pg 9) Summer 2011 (Summary: Appendix C, Analysis: pg 5, Evaluation: pg 9) **Evaluation: rating averaged with COP 4610 ratings

Program Outcome (Stated in Measurable Terms)	Assessment Methods	Results (Data summary and analysis)
. (Outcome (b) continued)	**4. Computer Science Core Areas** <u>Assessment Activity</u>: Assessment of project artifacts in Senior Project (CIS-4911) via the *Senior Project Outcomes Assessment* rubric. (See Appendix A). <u>Sample</u>: All completed CIS-4911 projects. <u>Minimum Criterion for Success</u>: At least 75% of projects will be rated at either 4 or 5 for this outcome.	<u>Fall 2010</u> (Summary: pg 4, Analysis: pg 6, Evaluation: pg 9) <u>Spring 2011</u> (Summary: pg 4, Analysis: pg 6, Evaluation: pg 9) **Fall & Spring data combined

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Program Outcome (Stated in Measurable Terms)	Assessment Methods	Results (Data summary and analysis)
c) Demonstrate proficiency in problem solving and application of software engineering techniques.	<u>Assessment Activity</u>: Assessment of project artifacts in Senior Project (CIS-4911) via the *Senior Project Outcomes Assessment* rubric. (See Appendix A). <u>Sample</u>: All completed CIS-4911 projects. <u>Minimum Criterion for Success</u>: At least 75% of projects will be rated at either 4 or 5 for this outcome.	<u>Fall 2010</u> (Summary: pg 4, Analysis: pg 6, Evaluation: pg 10) <u>Spring 2011</u> (Summary: pg 4, Analysis: pg 6, Evaluation: pg 10) **Fall & Spring data combined

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Program Outcome (Stated in Measurable Terms)	Assessment Methods	Results (Data summary and analysis)
d) Demonstrate mastery of at least one modern programming language and proficiency in at least one other.	**1. Mastery of at least one modern programming language** <u>Assessment Activity</u> Assessment of program artifacts in Data Structures (COP 3530). Sample is rated on each of several programming skill units via the *Programming Skill Assessment* rubrics. (See Appendix B). <u>Sample</u> Selected programming assignments completed by all students in one section of COP 3530, per year. <u>Minimum Criterion for Success</u> On each programming skill unit, at least 75% of the sample will be rated at 75% (6 of 8, or 9 of 12), or better. <u>Assessment Activity</u>: Assessment of project artifacts in Senior Project (CIS-4911) via the *Senior Project Outcomes Assessment* rubric. (See Appendix A). <u>Sample</u>: All completed CIS-4911 projects. <u>Minimum Criterion for Success</u>: At least 75% of projects will be rated at either 4 or 5 for this outcome.	<u>Spring 2011</u> (Summary: Appendix B, Analysis: pg 6, Evaluation: pg 10) <u>Fall 2010</u> (Summary: pg 4, Analysis: pg 6, Evaluation: pg 10) <u>Spring 2011</u> (Summary: pg 4, Analysis: pg 6, Evaluation: pg 10) **Fall & Spring data combined
(continued on following page)		

Program Outcome (Stated in Measurable Terms)	Assessment Methods	Results (Data summary and analysis)
. (Outcome (d) continued)	**2. Proficiency in at least one other modern programming language** <u>Assessment Activity</u> Assessment of program artifacts in Programming III (COP 4338) via the *C Language Proficiency Assessment* rubric. (See Appendix B). <u>Sample</u> Selected programming assignments completed by all students in one section of COP 4338, per year. <u>Minimum Criteria for Success</u> 75% of the sample will be rated at least 75%.	<u>Summer 2011</u> (Summary: Appendix C, Analysis: pg 7, Evaluation: pg 10) **Multithreading rubric metric included

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Program Outcome (Stated in Measurable Terms)	Assessment Methods	Results (Data summary and analysis)
e) Demonstrate understanding of the social and ethical concerns of the practicing computer scientist.	<u>Assessment Activity</u> Assessment of project artifacts in Professional Ethics and Social Issues in Computing (CGS-3092) via the *Ethics and Social Issues Assessment* rubric. (See Appendix C). <u>Sample</u> At least 20 completed projects from one semester, per year, each including a written paper and associated oral presentation. <u>Minimum Criteria for Success</u> A least 75% of the projects will be rated at least 75% (6 of 8). <u>Assessment Activity:</u> Assessment of project artifacts in Senior Project (CIS-4911) via the *Senior Project Outcomes Assessment* rubric. (See Appendix A). <u>Sample</u>: All completed CIS-4911 projects. <u>Minimum Criterion for Success</u>: At least 75% of projects will be rated at either 4 or 5 for this outcome.	<u>Fall 2010</u> (Summary: Appendix A, Analysis: pg 7, Evaluation: pg 10) <u>Fall 2010</u> (Summary: pg 4, Analysis: pg 7, Evaluation: pg 10) <u>Spring 2011</u> (Summary: pg 4, Analysis: pg 7, Evaluation: pg 10) **Fall & Spring data combined
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Program Outcome (Stated in Measurable Terms)	Assessment Methods	Results (Data summary and analysis)
f) Demonstrate the ability to work cooperatively in teams.	Assessment Activity: Assessment of project artifacts in Senior Project (CIS-4911) via the *Senior Project Outcomes Assessment* rubric (Appendix A). The principal component of this assessment is the *Teamwork Peer Assessment Rubric* completed by each CIS 4911 student. (See Appendix A). Sample: All completed CIS-4911 projects. Minimum Criterion for Success: At least 75% of projects will be rated at either 4 or 5 for this outcome.	Fall 2010 (Summary: pg 4, Analysis: pg 7, Evaluation: pg 10) Spring 2011 (Summary: pg 4, Analysis: pg 7, Evaluation: pg 10) **Fall & Spring data combined

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Program Outcome (Stated in Measurable Terms)	Assessment Methods	Results (Data summary and analysis)
g) Demonstrate effective communication skills.	Assessment Activity: Assessment of project artifacts in Senior Project (CIS-4911) via the *Senior Project Outcomes Assessment* rubric (Appendix A). The principal component of this assessment is observation of the final oral presentations. The *Oral Presentation Assessment* rubric is incorporated into the *Senior Project Outcomes Assessment* rubric. (See Appendix A). Sample: All completed CIS-4911 projects. Minimum Criterion for Success: At least 75% of projects will be rated at either 4 or 5 for this outcome.	Fall 2010 (Summary: pg 4, Analysis: pg 7, Evaluation: pg 10) Spring 2011 (Summary: pg 4, Analysis: pg 7, Evaluation: pg 10) **Fall & Spring data combined

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Program Outcome (Stated in Measurable Terms)	Assessment Methods	Results (Data summary and analysis)
h) Have experience with contemporary environments and tools necessary for the practice of computing.	Assessment Activity: Assessment of project artifacts in Senior Project (CIS-4911) via the *Senior Project Outcomes Assessment* rubric (Appendix A). Each CIS 4911 project team compiles a list of the tools and IDE's employed in completing their project. Sample: All completed CIS-4911 projects. Minimum Criterion for Success: At least 75% of projects will be rated at either 4 or 5 for this outcome.	Fall 2010 (Summary: pg 4, Analysis: pg 8, Evaluation: pg 11) Spring 2011 (Summary: pg 4, Analysis: pg 8, Evaluation: pg 11) **Fall & Spring data combined

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Summarize the use of results for continuous improvement of the educational program:

Appendices to this rubric:

Appendix **A**: CIS 4911 Senior Project Rubrics

A.1 Senior Project Outcomes Assessment Rubric – all Outcomes

A.2 Teamwork Peer Assessment Rubric – Outcome (f)

A.3 Oral Presentation Assessment Rubric *(incorporated into A.1)* – Outcome (g)

Appendix **B**: Programming Artifact Rubrics

B.1.1 CS Core: Computer Systems - Multithreading (COP 4338) - Outcome (b)

B.1.2 CS Core: Computer Systems - Operating Systems (COP 4610) - Outcome (b)

B.2.1 Programming Mastery: Abstraction/Java (COP 3530) - Outcome (d)

B.2.2 Programming Mastery: Exceptions/Java (COP 3530) - Outcome (d)

B.2.3 Programming Mastery: Inheritance/Java (COP 3530) - Outcome (d)

B.2.4 Programming Mastery: Linked Structures/Java (COP 3530) - Outcome (d)

B.2.5 Programming Mastery: Recursion/Java (COP 3530) - Outcome (d)

B.2.6 Programming Mastery: Libraries / Java API (COP 3530) - Outcome (d)

B.2.7 Programming Proficiency: C Language (COP 4338) - Outcome (d)

Appendix **C**: Ethics & Social Issues Rubric (CGS 3092)

C.1 Ethics and Social Issues Assessment Rubric – Outcome (e)

Appendix **D**: Course-Embedded Multiple-Choice Question Pools

D.1 Discrete Mathematics (MAD-2104) - Outcome (a)

D.2 Formal Languages and Automata (MAD-3512) - Outcome (a)

D.3 Data Structures and Algorithms (COP-3530) - Outcome (b)

D.4 Concepts of Programming Languages (COP-4555) - Outcome (b)

D.5 Databases (COP-4710) - Outcome (b)