

Student Learning Outcomes Assessment
Department: Mathematics and Computer Science

Academic Year: 2015
Program: BS—Computer Science

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	<u>Objective 1. A:</u> Graduates will be able to apply the tools, theory and practices of computer science. A.--CS students apply programming skills to meet specifications.	CSCI 330 Object Oriented Programming	AS Computer Science 2.0 BSCS Application 4.0 BSCS Theoretical 2.5 BSCS Game & VWD 2.3 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 2.7	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior surveys do not indicate any issues with the exception of the ranking of the one Theoretical response that developing software systems was somewhat met (level 2).
		CSCI 385 Data Structures and Algorithm Analysis	BSCS Application 3.2 BSCS Theoretical 3.7 BSCS Game & VWD 3.2 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 3.3		
Impression	The results indicate we are moving in the right direction with our established and our new tracks. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	There is an assessment hole here for the AS Computer Science students.				
Proposed Action Item: Assessment Tool	We will need to collect two artifacts from AS students in order to measure this outcome for this program.				
Proposed Action Item: Program Content and Course Assessment Practices	Also, senior surveys should be modified to accurately align with the objectives and the courses required within the specific track.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year. In Spring 2016, students will administer network systems and produce game systems.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	<p><u>Objective 2: A:</u> Graduates will be able to apply critical thinking, analytical and logical skills to solve problems. A.--CS students employ critical thinking and mathematical skills.</p>	CSCI 385 Data Structures and Algorithm Analysis (Assessment #1)	BSCS Application 3.2 BSCS Theoretical 3.7 BSCS Game & VWD 3.2 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 3.3	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior surveys indicate that students feel that they have developed and can apply mathematical skills.
		CSCI 385 Data Structures and Algorithm Analysis (Assessment #2)	BSCS Application 3.9 BSCS Theoretical 4.0 BSCS Game & VWD 3.4 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 3.7		
Impression	The results indicate we are moving in the right direction with our established and our new tracks. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	None.				
Proposed Action Item: Assessment Tool	We will implement this assessment tool again next semester.				
Proposed Action Item: Program Content and Course Assessment Practices	A-Students did well on these assessments and are performing in the expected range. Senior surveys indicate that students feel that they have developed and can apply mathematical skills.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	<u>Objective 2:B:</u> Graduates will be able to apply critical thinking, analytical and logical skills to solve problems.	CSCI 330 Object Oriented Programming	AS Computer Science 2.0 BSCS Application 3.7 BSCS Theoretical 2.0 BSCS Game & VWD 3.3 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 2.9	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior surveys indicate that students feel that they have developed and can apply mathematical skills.
	B.--CS students analyze and synthesize problem information in order to develop a solution.	CSCI 385 Data Structures and Algorithm Analysis	BSCS Application 3.9 BSCS Theoretical 4.0 BSCS Game & VWD 3.6 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 3.8		Senior surveys for this outcome are acceptable.
Impression	The results indicate we are moving in the right direction with our established and our new tracks. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	None.				
Proposed Action Item: Assessment Tool	We will implement this assessment tool again next semester.				
Proposed Action Item: Program Content and Course Assessment Practices	B- Results are what would be expected. There was improvement as students progressed through the program. Data passed on to curriculum committee for consideration. Topics seem to show good results, and are in keeping with earlier assessments of the same material.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	<u>Objective 3:A:</u> Graduates will possess the ability to communicate in a professional manner. A.-CS students produce readable and understandable documents.	CSCI 480 Computer Science Seminar (Project Reflection)	BSCS Application 4.0 BSCS Theoretical 3.0 BSCS Game & VWD 3.0 Overall 3.2	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior survey results were quite good for this outcome.
		CSCI 485 Project in Game Development (Project Reflection)	BSCS Game & VWD 3.0		
		CSCI 496 Computer Science Internship (Project Reflection)	AS Computer Science 3.5 BSCS Application 3.5 BSCS Game & VWD 3.0 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 3.4		
		CSCI 496 Computer Science Internship (Tool Research)	AS Computer Science 3.5 BSCS Application 3.4 BSCS Game & VWD 3.0 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 3.2		
Impression	The results indicate we are moving in the right direction with our established and our new tracks. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	Need more information.				
Proposed Action Item: Assessment Tool	We need to make sure to collect the tool research artifact from both CSCI 480 and CSCI 485 in the future.				
Proposed Action Item: Program Content and Course Assessment Practices	Data passed on to curriculum committee for consideration. Topics seem to show good results, and are in keeping with earlier assessments of the same material.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	<p><u>Objective 3:B:</u> Graduates will possess the ability to communicate in a professional manner. B.- CS students design, compose, and effectively deliver professional presentations.</p>	CSCI 480 Computer Science Seminar (Project Proposal Presentation) All objectives are assessed every year.	BSCS Application 4.0 BSCS Theoretical 4.0 BSCS Game & VWD 4.0 Overall 4.0	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior survey results for this outcome are acceptable.
		CSCI 480 Computer Science Seminar (Project Final Presentation)	BSCS Application 4.0 BSCS Theoretical 4.0 BSCS Game & VWD 4.0 Overall 4.0		
		CSCI 496 Computer Science Internship (Internship Presentation)	AS Computer Science NA BSCS Application 4.0 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 4.0		
Impression	The results indicate we are moving in the right direction with our established and our new tracks. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	This assessment needs some work. We missed many assessments in this round.				
Proposed Action Item: Assessment Tool	We need to make sure and assess the presentations in the corresponding courses. If presentations are done on group projects, all students must deliver part of the presentation. The faculty teaching the course should apply the rubric to this assessment.				
Proposed Action Item: Program Content and Course Assessment Practices	Data passed on to curriculum committee for consideration. Topics seem to show good results, and are in keeping with earlier assessments of the same material.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	<u>Objective 4:A:</u> Graduates will recognize and understand the professional, social and ethical responsibilities associated with computer science. A.-CS students understand professional issues and responsibilities.	CSCI 485 Project in Game Development (Work Log Files)	BSCS Game & VWD 3.3	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior surveys in the Game Track and the Theoretical track indicate there is need for improvement on this outcome.
		CSCI 496 Computer Science Internship (Work Log Files)	AS Computer Science 4.0 BSCS Application 3.9 BSCS Game & VWD 3.0 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 3.8		
Impression	The results indicate we are moving in the right direction with our established and our new tracks. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	This assessment needs some work. We missed several assessments in this round				
Proposed Action Item: Assessment Tool	We should probably consider some sort of common framework for the development of work logs so that students report more consistently.				
Proposed Action Item: Program Content and Course Assessment Practices	Data passed on to curriculum committee for consideration. Topics seem to show good results, and are in keeping with earlier assessments of the same material.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	<u>Objective 4:B:</u> Graduates will recognize and understand the professional, social and ethical responsibilities associated with computer science. B.—CS students understand legal/security issues and responsibilities.	CSCI 480 Computer Science Seminar (Assignment)	BSCS Application 3.0 BSCS Theoretical 3.5 BSCS Game & VWD 2.0 Overall 3.2	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior survey results are acceptable for this outcome.
		CSCI 496 Computer Science Internship (Portfolio – Legal/Security)	AS Computer Science 3.5 BSCS Application 2.6 BSCS Game & VWD 1.0 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 2.6		
Impression	The results indicate we are moving in the right direction with our established and our new tracks. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	This assessment needs some work. We missed the capstone survey assessment in this round.				
Proposed Action Item: Assessment Tool	The curriculum does not have a dedicated security course, therefore these results are not out of line.				
Proposed Action Item: Program Content and Course Assessment Practices	Data passed on to curriculum committee for consideration. Topics seem to show good results, and are in keeping with earlier assessments of the same material.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	Objective 4:C: Graduates will recognize and understand the professional, social and ethical responsibilities associated with computer science. C.- CS students understand ethical/ social responsibilities.	CSCI 480 Computer Science Seminar (Assignment)	BSCS Application 2.0 BSCS Theoretical 3.8 BSCS Game & VWD 3.0 Overall 3.3	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior survey results are acceptable for this outcome.
Impression	The results indicate we are moving in the right direction with our established and our new tracks. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	Although these results are fairly good, the assessments for this area need some work.				
Proposed Action Item: Assessment Tool	We need more assessments and we missed the capstone survey assessment in this round.				
Proposed Action Item: Program Content and Course Assessment Practices	Data passed on to curriculum committee for consideration. Topics seem to show good results, and are in keeping with earlier assessments of the same material.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	<u>Objective 4:D:</u> Graduates will recognize and understand the professional, social and ethical responsibilities associated with computer science. D.- CS students understand the value of CS professionals participating in, and promoting, community service.	CSCI 480 Computer Science Seminar (Assignment)	BSCS Theoretical 2.3 BSCS Game & VWD 3.0 Overall 2.5	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior surveys might indicate that students need some direction in volunteering for community service.
Impression	The results indicate we are moving in the right direction with our established and our new tracks. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	Although these results are fairly good, the assessments for this area need some work.				
Proposed Action Item: Assessment Tool	We need more assessments as this was missed in the other 2 capstone courses. We missed the capstone survey assessment in this round.				
Proposed Action Item: Program Content and Course Assessment Practices	Data passed on to curriculum committee for consideration. Topics seem to show good results, and are in keeping with earlier assessments of the same material.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	<u>Objective 5:A:</u> Graduates will recognize the need for continuous learning. A.-CS students recognize the value of memberships in the professional organizations.	CSCI 496 Computer Science Internship (Portfolio – Professional Societies)	AS Computer Science 2.0 BSCS Application 0.7 BSCS Game & VWD 0.0 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 0.9	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior surveys are low and seem to substantiate the assessment results for this outcome.
Impression	The results indicate we are moving in the right direction with our established and our new tracks. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	This result is too low. We need to stress the benefits of membership in the professional societies in other areas of the curriculum.				
Proposed Action Item: Assessment Tool	Senior surveys are low and seem to substantiate the assessment results for this outcome.				
Proposed Action Item: Program Content and Course Assessment Practices	Data passed on to curriculum committee for consideration. Topics seem to show good results, and are in keeping with earlier assessments of the same material.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	<u>Objective 5:B:</u> Graduates will recognize the need for continuous learning.	CSCI 480 Computer Science Seminar (Paper Proposal)	BSCS Application 3.0 BSCS Theoretical 3.3 BSCS Game & VWD 2.0 Overall 3.0	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior surveys results are quite good for this outcome.
		CSCI 496 Computer Science Internship (Portfolio – Tool Research)	AS Computer Science 3.5 BSCS Application 2.6 BSCS Game & VWD 1.0 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 2.6		
Impression	The results indicate we are moving in the right direction with our established and our new tracks. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	These results are fairly good.				
Proposed Action Item: Assessment Tool	Perhaps through incorporation of the additional course embedded artifact on research gathering, the results for the tracks other than the theoretical track will improve.				
Proposed Action Item: Program Content and Course Assessment Practices	Data passed on to curriculum committee for consideration. Topics seem to show good results, and are in keeping with earlier assessments of the same material.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Fall 2015	<u>Objective 5:C:</u> Graduates will recognize the need for continuous learning.	CSCI 480 Computer Science Seminar (Paper Proposal)	BSCS Application 3.0 BSCS Theoretical 3.0 BSCS Game & VWD 2.0 Overall 2.8	Senior surveys: 4= completely met, 3= mostly met, 2=somewhat met 1=not met, 0=no opinion	Senior surveys results are quite good for this outcome.
		CSCI 496 Computer Science Internship (Portfolio – Tool Research)	AS Computer Science 3.5 BSCS Application 2.6 BSCS Game & VWD 1.0 BSCS Web Dev NA-new BSCS System Admin NA-new Overall 2.6		
Impression	These results are average. The scale used is: 4= excellent, 3 = good, 2= developing, 1=beginning, 0=not completed.				
Limitations	Could use additional info.				
Proposed Action Item: Assessment Tool	Perhaps through incorporation of the additional course embedded artifact on research analysis and evaluation, the results for all tracks will improve.				
Proposed Action Item: Program Content and Course Assessment Practices	Data passed on to curriculum committee for consideration. Topics seem to show good results, and are in keeping with earlier assessments of the same material.				
Action Items Implemented	Data sent to curriculum committee.				
Objective to be Assessed Next Year	All objectives are assessed every year.				

Student Learning Outcomes Assessment

**Academic Year: 2015
Program: Mathematics**

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
2015	<p>Mathematics Pure and Actuarial Tracks, Objective 1: Graduates will be able to explain the fundamental concepts of a. real analysis of one variable b. calculus of several variables and vector analysis c. linear algebra and the theory of vector spaces d. probability and statistics e. abstract algebra [except Actuarial track]</p>	<p>This was addressed last year (in the 2014 report) using multiple embedded test questions scored on 0–5 point scale by faculty, on points a-e. We noted in that report that for objective 1b, the results in MATH 411 were significantly lower than results in MATH 311, so we chose to collect data again on this sub-objective during 2015. Using the same two questions on a 0–5 point scale we again checked in both classes</p>	<p>New data collected: (Averages on each question, reported from both MATH 311 and MATH 411): Objective 1b 2015 (311): Q1 (Limit): 2.17 Q2 (Integral): 1.67 2015 (411): Q1 (Limit): 2.83 Q2 (Integral): 2.00</p>	<p>Senior surveys (ranking 0–4)</p>	<p>(Averages , 2013–2015) (a) 2.6 (b) 2.9 (c) 3.6 (d) 3.9</p>
Impression	<p>For comparison, the 2014 report results on the same questions for the MATH 411 students are included below: Q1: 1.7 (411 only); Q2: 1.8 (411 only) This year, the MATH 411 performed somewhat above MATH 311 students, but both were low for basic multivariable calculus concepts.</p>				
Limitations	<p>We may want more detailed data gathered on student understanding of multivariable calculus concepts to determine which areas within this topic are weak, besides those which we specifically checked in this assessment.</p>				
Proposed Action Item: Assessment Tool	<p>Further details about a wider variety of topics within calculus of several variables should be gathered in the next collection phase</p>				
Proposed Action Item: Program Content and Course Assessment Practices	<p>Data passed on to curriculum committee for consideration of weakness in multivariable calculus concepts. All other topics seem to show good results, and are in keeping with earlier assessments of the same material.</p>				
Action Items Implemented	<p>We noted in the 2014 report, that our current work on proofs (see Objective 4) should help with problems such as problem 5 in the original assessment; many fundamental concepts are related to proofs. From the 2015 data: None at this time; data has been sent to the curriculum committee.</p>				
Objective to be Assessed Next Year	<p>Math Pure/Actuarial Objective 2; Actuarial 1, 3, and 5.</p>				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
2015	Math Pure and Actuarial Objective 3: Graduates will be able to interpret and solve mathematical problems by a. selecting appropriate mathematical tools b. selecting and implementing technology when appropriate c. communicating the results in written and oral form	Changed in 2014–2015: (a) Faculty observed group problem solving sessions (Spring and Fall Math 480); (b) Technology based open-ended statistics assignment obtained from Math 360, Spring 2014; (c) Written assignments collected from Math 411, Spring 2015, and oral presentations	(a) Good; see qualitative data in “Impressions” and more detail in addendum below. (b) Some potential weaknesses; see “Impressions” and later details. (c) Mostly good; see “Impressions” and later more detailed report.	Senior surveys (ranking 0–4)	(Averages, 2013–2015) (a) 3.8 (b) 3.7 (c) 3.7
Impression	(a) Excellent ability to select appropriate techniques in the Spring seminar class, and somewhat weaker in the Fall. Both showed at least some ability to select appropriate tools. (See addendum below.) (b) Widely varying uses of technology among students. There may be too few courses which explicitly include this objective. We may wish to standardize some of the tools students use. (See addendum below.) (c) Generally strong written and oral presentations. Written work occasionally left out minor points. Written was judged on 0–5 scale, with average of 3.33/5 and 4.17/5. Oral presentations had some tendency to “start in the middle” (without a good sense of audience) and visual aids were sometimes too cluttered, but otherwise the presentations were clear and correct. (See addendum below.)				
Limitations	(a) Excellent ability to select appropriate techniques in the Spring seminar class, and somewhat weaker in the Fall. Both showed at least some ability to select appropriate tools. (See addendum below.) (b) Widely varying uses of technology among students. There may be too few courses which explicitly include this objective. We may wish to standardize some of the tools students use. (See addendum below.) (c) Generally strong written and oral presentations. Written work occasionally left out minor points. Written was judged on 0–5 scale, with average of 3.33/5 and 4.17/5. Oral presentations had some tendency to “start in the middle” (without a good sense of audience) and visual aids were sometimes too cluttered, but otherwise the presentations were clear and correct. (See addendum below.)				
Proposed Action Item: Assessment Tool	(a) May consider subdividing into smaller groups, and again including both spring and fall semesters next time. As a whole, this seems much better than the previous tool. (See addendum below for more details.) (b) Check other types of technology outside of statistics related software. Better than previous tool. (c) Assessment tool seems satisfactory, although we might consider sampling more assignments. Presentations for seminar are often carried into presentations at local conferences in the following semester, and we should consider looking at these as well. Again, better than previous tool. (See addendum below.)				

Proposed Action Item: Program Content and Course Assessment Practices	<p>(a) Continue giving students multi-step and open-ended questions. (The performance is good overall.)</p> <p>(b) Find additional places to insert technology objectives in the curriculum. See if there is a way to agree on and standardize technology across classes, such as selecting software (like R or SPSS) for statistical analysis.</p> <p>(c) Continue the process of encouraging students to write and present at all levels. We should emphasize importance of audience and of avoiding “overload” in presenting material. The process of preparing students for such presentations (including many presentations at local conferences) has improved their communication abilities since the last observation. Faculty should be sure to emphasize the importance of <i>interpreting</i> results correctly, especially in statistical analysis or mathematical modeling.</p>
Action Items Implemented	<p>This assessment tool replaces an earlier assessment using embedded test questions which the committee found unsuitable. In particular, the embedded questions did not give us much insight into students’ problem solving techniques and choices of mathematical or technological tools. This round uses a completely redesigned instrument (see addendum below for more details).</p> <p>No content changes related to this objective at this time. Suggestions relayed to mathematics curriculum committee for consideration.</p>
Objective to be Assessed Next Year	<p>Math Pure/Actuarial Objective 2; Actuarial 1, 3, and 5.</p>

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
2015	Math Pure/Actuarial Objective 4: Graduates will be able to demonstrate understanding of mathematical proof by a. applying the structure and results of existing proofs to establish new mathematical results b. employing a variety of established logical techniques to write a mathematical proof c. distinguishing between valid and invalid/incomplete logical reasoning	Addressed in 2012 report using embedded problems in assignments 4a: (MATH 370) 4b1: (MATH 411) 4b2: (MATH 370) 4b3: (MATH 370)	[See 2012 report]	Senior surveys (ranking 0–4)	(Averages, 2013–2015) (a) 3.6 (b) 3.4 (c) 3.4
Impression	Students were judged generally weak on this objective. We only found good performance on the simplest questions in this set. We observed very little improvement since the last round of assessment.				
Limitations	None; the assessment tool is considered suitable.				
Proposed Action Item: Assessment Tool	None; the assessment tool is considered suitable.				
Proposed Action Item: Program Content and Course Assessment Practices	None new this year, although implementation is being completed (see “Action Items Implemented”). [See 2013 report for full recommendations.]				
Action Items Implemented	MATH 290 has been approved and is scheduled to be offered for the first time next semester (Spring 2016). (As a result, we will postpone assessing this objective for a few more years.) From 2013 report: Adopted textbook to be used through upper-level courses as a resource. Proposed new course focused on proof. Changed course curriculum for MATH 275 to increase emphasis on proofs.				
Objective to be Assessed Next Year	Math Pure/Actuarial Objective 2; Actuarial 1, 3, and 5.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
2015	Mathematics, Actuarial Track: A1 and A3 A1: Gain an understanding of interest theory, annuities, discounts, and funds from a mathematical and financial viewpoint A3: Attain an understanding of the fundamental factors which influence the economy in the context of microeconomics and macroeconomics	New assessment developed this year; see below.	None yet.	Senior surveys (ranking 0-4)	(Averages, 2013-2015) A1: 2 A2: 2.67
Impression	Both of these topics are taught through classes in the Business school. Consultation with the business school in 2014 and 2015 has resulted in a series of questions covering this topic (and A3) which will be administered to senior Actuarial students in Spring 2016.				
Limitations	Lack of expertise in department. We sought aid from outside the department.				
Proposed Action Item: Assessment Tool	The questions developed with the aid of Business faculty will be administered to our students starting in spring semester 2016. The faculty from Business also provided us with a key for these questions to allow us to perform the assessment in a field we do not have expertise in.				
Proposed Action Item: Program Content and Course Assessment Practices	None.				
Action Items Implemented	Assessment tool developed. (See above.)				
Objective to be Assessed Next Year	Math Pure/Actuarial Objective 2; Actuarial 1, 3, and 5.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
2015	Mathematics, Actuarial Track: A2 Apply statistical models for description, prediction, and inference based on data samples	Preliminary data in 2015 coming from a statistical assignment also used to assess the use of technology.	Basic skills, but lack of interpretation.	Senior surveys (ranking 0-4)	(Averages, 2013-2015) 3.5
Impression	Students showed some basic ability to select and administer tests, but in most cases failed to completely interpret the results of their models. (See details in addendum below.)				
Limitations	Insufficient as a primary tool for assessing this skill.				
Proposed Action Item: Assessment Tool	We have suggested that faculty teaching statistics courses develop a more appropriate tool specifically for this objective.				
Proposed Action Item: Program Content and Course Assessment Practices	We encourage all probability and statistics classes to continue to emphasize the importance of explaining and interpreting the results of statistical models.				
Action Items Implemented	Conclusions passed on to those tasked with teaching all probability and statistics classes.				
Objective to be Assessed Next Year	Math Pure/Actuarial Objective 2; Actuarial 1, 3, and 5.				

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
2015	Mathematics, Actuarial Track A5: Gain an understanding of professional opportunities and responsibilities of the future actuary.	Questions given to students in Actuarial Seminar (senior level course) and comparison to responses from incoming students	Inconclusive. See below.	Senior surveys (ranking 0-4)	(Averages, 2013-2015) 2.67
Impression	An initial survey was made of students in 2013, using almost exactly the wording used in the objective. The committee feels that students may not have understood the question, and while some responses indicated an understanding of what actuarial work entails, some seemed to answer unrelated questions. We felt the survey questions should be changed. A new set of questions was given at the end of spring 2015 to the actuarial seminar students. Examination of these responses seems much more in line with data we can use for assessing this objective. For comparison, data still needs gathered from the incoming students.				
Limitations	Questions may have been too vague.				
Proposed Action Item: Assessment Tool	No further changes to the questions, but administer to both incoming and exiting students.				
Proposed Action Item: Program Content and Course Assessment Practices	Not yet.				
Action Items Implemented	In 2014, the questions were re-written to get more useful responses. (Questions are included in the addendum below.) In 2015, we have new data collected from the Actuarial Seminar (senior capstone taken by these majors).				
Objective to be Assessed Next Year	Math Pure/Actuarial Objective 2; Actuarial 1, 3, and 5.				