

## 2016-17 Student Learning Assessment Report, Academic

<b>Program:</b> Actuarial Science	<b>Degree:</b> Major	<b>Department Head:</b> John ONeill	<b>Submitted By:</b> John ONeill	<b>Date Submitted:</b> 06/07/2017	
<p><b>Mission:</b></p> <p>The Actuarial Science program and the Risk Management Certificates were approved by the Siena College BOI and NYS Education Department over the Spring and Summer of 2008 for offering in the 2009-2010 academic year. These programs were designed to be a interdisciplinary programs jointly housed in the School of Business and School of Science to meet the standards set forth by the Society of Actuaries and Casualty Actuary Society encapsulating educational background central to the needs of aspiring actuaries. First and foremost, students in these programs need to have strong mathematical backgrounds stemmed in classical treatment of mathematics. Students also need working knowledge of the types of problems encountered in business by actuaries particularly in the areas of Economics and Finance. They also need a firm understanding of the mathematical principles that govern those disciplines.</p> <p>Due to the interdisciplinary nature of the program, most assessment will take place by compiling the results of component courses that contribute towards other majors; thus the development of the assessment plan for actuarial science is highly dependent on the progress of the individual departments (Mathematics, Economics and Finance) in their own assessment plans.</p>					
<b>1. Major/Program Student Learning Outcomes</b> Students will be able to...	<b>2. Phase</b>	<b>3. Assessment Procedures</b> (Planning/ determining)	<b>4. Assessment Results</b> ( Collecting/ analyzing)	<b>5. Use of Results</b> (Discussing/ using results)	<b>6. Determining if changes impacted student learning</b>
<p>1. Solve basic and advanced mathematical problems.</p> <p>Criteria: (How do you know students are achieving learning outcome?) At least 80% of students score 60% or greater on each skill.</p>	<p>Planning</p> <p>Collecting</p> <p>Discussing</p>	<p>Method: (ex. tests, presentations, research paper) Test performance</p> <p>Using a Sample of Students? No</p> <p>If yes, describe your sample.</p>	<p>Calculus 1 (Fall 2015): Criteria was met for 2 of 8 skills assessed.</p> <p>Calculus 2 (Spring 2016): Criteria was met for 0 of 4 skills assessed.</p> <p>Learning Outcome Met? (Based on Criteria)</p>	<p>Remediation will continue in MATH 371 through the use of just-in-time methodology and reinforcing skills level knowledge.</p>	

		<p>When does assessment occur? MATH 1110 and MATH 120</p> <p>How often does assessment occur? Once</p>	No		
<p>2. Apply methods learned in the solutions of those problems to those encountered in actuarial science.</p> <p>Criteria: (How do you know students are achieving learning outcome?) At least 80% of students score 70% or higher for each concept</p>	<p>Collecting</p> <p>Discussing</p>	<p>Method: (ex. tests, presentations, research paper) Final exam performance</p> <p>Using a Sample of Students? Yes</p> <p>If yes, describe your sample. ACSC students from CRN 40185</p> <p>When does assessment occur? MATH 371</p> <p>How often does assessment occur? Annually</p>	<p>On 5 of the 9 problems assessed, at least 80% of the actuarial students scored above 70%. (Counting, Bayes Theorem, Discrete distributions, Normal distribution, Deductible Calculation)</p> <p>Of the remaining 4 problems assessed, at least 80% scored above 60 (Relationship between Poisson and exponential, Multivariate Descriptions)</p> <p>The remaining two problems were failures: Inverse function theorem and Min/Max Density</p> <p>Learning Outcome Met? (Based on Criteria) Yes</p>	<p>It should be noted that a full week of class time was lost to inclement weather; an anomaly.</p>	

<p>3. Use statistics and actuarial mathematics to partially address problems in fields such as insurance, financial forecasting, pricing and investment.</p> <p>Criteria: (How do you know students are achieving learning outcome?) At least 80% of students meet or exceed a score of 70%</p>	<p>Collecting</p> <p>Discussing</p>	<p>Method: (ex. tests, presentations, research paper) Final Exam</p> <p>Using a Sample of Students?</p> <p>If yes, describe your sample.</p> <p>When does assessment occur? MATH/QBUS480</p> <p>How often does assessment occur? When course is offered.</p>	<p>15 of 19 students scored an aggregate of over 70% overall on 8 topics; Payoff Diagrams for Financial Derivatives, Profit for Financial Derivatives, Equivalent Rates of Interest and Discount; Valuation of Annuities; Time and dollar-Weighted Return; Increasing Annuities; Macaulay Duration based on a Yield Curve; Exact Matching for Liabilities.</p> <p>The goal was achieved individually on: Equivalent Rates of Interest and Discount Valuation of Annuities</p> <p>MacAulay Duration Increasing Annuities</p> <p>The goal was not achieved on: Payoff Diagrams Profit Diagrams Time and Dollar weighted Return Exact Liability Matching</p> <p>Learning Outcome Met? (Based on Criteria)</p>	<p>The learning outcomes in Mathematics of Finance will be rewritten to disclude Financial derivatives and include interest rate swaps as the treatment of financial derivatives was too light and is no longer required by the SOA/CAS for Exam FM. This will allow for a net increase in time to spend on time and dollar weights and exact liability matching.</p> <p>Treatment of Financial Derivatives will be handled in FINC 480</p>	
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<p>4. Describe fundamental practice in business from the viewpoint of economics and finance.</p> <p>Criteria: (How do you know students are achieving learning outcome?) At least 80% of students meet or exceed a score of 70%</p>	Not Done	<p>Method: (ex. tests, presentations, research paper)</p> <p>Using a Sample of Students?</p> <p>If yes, describe your sample.</p> <p>When does assessment occur?</p> <p>How often does assessment occur?</p>	<p>Learning Outcome Met?</p> <p>(Based on Criteria)</p>		
<p>5. Effectively communicate quantitative results in oral and written presentation, including the construction of elementary proofs..</p> <p>Criteria: (How do you know students are achieving learning outcome?) Writing: Use of written School of Business rubric applied to ACSC students in ECON 430. 80% will score over 70% on the rubric. Oral: Team Presentations in Math 470</p>	<p>Planning2+</p> <p>Collecting</p>	<p>Method: (ex. tests, presentations, research paper) Oral: Presentation Written: Paper</p> <p>Using a Sample of Students? Yes</p> <p>If yes, describe your sample. Actuarial students in ECON 430 Fall 2017</p> <p>When does assessment occur? ECON 430 and MATH 470, respectively</p> <p>How often does assessment occur? Each year</p>	<p>Oral communication in MATH 470 was not assessed in Fall 2016.</p> <p>Written communication will be assessed in Fall 2017 via econometrics analysis in ECON 430.</p> <p>Learning Outcome Met? (Based on Criteria) Yes</p>		

<p>6. Effectively utilize technology in the organization of data and solving problems.</p> <p>Criteria: (How do you know students are achieving learning outcome?) Use of a rubric utilized by the school of business; 80% will score over 75% on the assignment</p>	<p>Planning2+ Not Done</p>	<p>Method: (ex. tests, presentations, research paper) Microsoft Excel Project</p> <p>Using a Sample of Students? Yes</p> <p>If yes, describe your sample. ACSC students in MATH 470</p> <p>When does assessment occur? Fall 2017</p> <p>How often does assessment occur? Once every two years</p>	<p>Learning Outcome Met? (Based on Criteria)</p>		
<p>7. Be employable in actuarial fields.</p> <p>Criteria: (How do you know students are achieving learning outcome?) 80% will be employed as an actuary or related field or seeking graduate degrees.</p>	<p>Collecting</p>	<p>Method: (ex. tests, presentations, research paper) Student Self-Report</p> <p>Using a Sample of Students?</p> <p>If yes, describe your sample.</p> <p>When does assessment occur? Prior to graduation</p> <p>How often does assessment occur? Annually</p>	<p>Of the 10 students graduating AY 2016-2017 5 are employed as actuaries at Mercer, Willis-Towers-Watson, the Department of Financial Services and Farm Family Insurance. 2 others are employed in finance analysis. One is a foreign national who will be returning to romania. 2 others are still seeking employment. They have not passed Exam P or exam FM at this point.</p>		

			Learning Outcome Met? (Based on Criteria) Yes		
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