Central Washington University
Assessment of Student Learning
Department and Program Report

Please enter the appropriate information concerning your student learning assessment activities for this year.

Academic Year of Report: 2013/2014
College: COTS
Department: Mathematics
Program: Actuarial Science, Mathematics

1. What student learning outcomes were assessed this year, and why?
In answering this question, please identify the specific student learning outcomes you assessed this year, reasons for assessing these outcomes, with the outcomes written in clear, measurable terms, and note how the outcomes are linked to department, college and university mission and goals.

The first 5 of the Student Learning Outcomes (attached) were assessed. We chose these because they had similar Criterion of Achievement.

2. How were they assessed?
In answering these questions, please concisely describe the specific methods used in assessing student learning. Please also specify the population assessed, when the assessment took place, and the standard of mastery (criterion) against which you will compare your assessment results. If appropriate, please list survey or questionnaire response rate from total population.

A) What methods were used?
For the Outcomes with a Grade-based Criterion of Achievement, data from Safari was obtained. Additionally, we were able to collect data relating to the number of Society of Actuaries’ exams passed from the advisors.

B) Who was assessed?
We assessed Actuarial Science majors who graduated during the 2012-2013 academic year.

C) When was it assessed?
Fall Quarter, 2012; Winter Quarter, 2013; Spring Quarter 2013

3. What was learned?
In answering this question, please report results in specific qualitative or quantitative terms, with the results linked to the outcomes you assessed, and compared to the standard of mastery (criterion) you noted above. Please also include a concise interpretation or analysis of the results.

We learned that while we seem to be doing a good job meeting Student Learner Outcome #1, we failed to meet our goal for Outcomes #2,3,4,5. Since the courses we chose to base our criteria on are directly related to preparing students to pass the Society of Actuaries’ exams, we looked at the pass rate on
these exams for these same students. Happily, 73.3% of our students passed at least one exam and 40.0% passed at least two. These percentages are above national averages. Consequently, we learned that more effort needs to be devoted to aligning the curriculum and expectations in a few of our senior-level Actuarial Science courses with the Society of Actuaries’ exams.

4. **What will the department or program do as a result of that information?**

   In answering this question, please note specific changes to your program as they affect student learning, and as they are related to results from the assessment process. If no changes are planned, please describe why no changes are needed. In addition, how will the department report the results and changes to internal and external constituents (e.g., advisory groups, newsletters, forums, etc.).

   First, we will discuss the results in a department meeting. Following that, we will continue to hone our major classes, especially Math 417ABC and 419ABC to more clearly align with the Society of Actuaries’ exams.

5. **What did the department or program do in response to last year’s assessment information?**

   In answering this question, please describe any changes that have been made to improve student learning based on previous assessment results. Please also discuss any changes you have made to your assessment plan or assessment methods.

   Last year’s reading assessment was discussed in department meetings. Generally, the department was satisfied with the results.

6. **Questions or suggestions concerning Assessment of Student Learning at Central Washington University:**
Many Student Learning Outcomes for this program are assessed through Course Grades and Surveys.

For Course Grade based assessment, the Criterion of Achievement is “80% of students pass course with a B or better on 1st or 2nd attempt” referred to as “Grade Criterion” in the table below.

For Survey based assessment, the Criterion of Achievement is a response rate of 80% and that 80% of student responses are either Strongly Agree or Agree with the statements in the survey. This is referred to as “Survey Criterion” in the table below.

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Method(s) of Assessment</th>
<th>Who Assessed?</th>
<th>When Assessed?</th>
<th>Criterion of Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Graduates will be able to use statistical methods to analyze and model time-independent and time-series data.</td>
<td>Course Grade</td>
<td>Students in MATH 311, 410AB, 411BC</td>
<td>Quarterly</td>
<td>Grade Criterion</td>
</tr>
<tr>
<td>2. Graduates will be able to use statistical methods and credibility theory to analyze and model insurance loss data.</td>
<td>Course Grade</td>
<td>Students in MATH 417ABC</td>
<td>Quarterly</td>
<td>Grade Criterion</td>
</tr>
<tr>
<td>3. Graduates will be able to formulate actuarial problems in mathematics, probabilistic and statistical terms.</td>
<td>Course Grade</td>
<td>Students in MATH 417ABC, 418AB, 419ABC</td>
<td>Quarterly</td>
<td>Grade Criterion</td>
</tr>
<tr>
<td>4. Graduates will be able to apply common probability distributions to actuarial applications.</td>
<td>Course Grade</td>
<td>Students in MATH 411AB, 417ABC, 419ABC</td>
<td>Quarterly</td>
<td>Grade Criterion</td>
</tr>
<tr>
<td>5. Graduates will be able to apply concepts of differential and integral calculus to actuarial problems.</td>
<td>Course Grade</td>
<td>Students in 411AB, 418ABC, 417ABC, 419ABC</td>
<td>Quarterly</td>
<td>Grade Criterion</td>
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<td>6. Graduates will be able to employ simulation techniques to analyze and solve dynamic and complex stochastic and mathematical models</td>
<td>Internship Survey and Post-Graduation Survey</td>
<td>Students on Internships and Graduates</td>
<td>Fall, Winter</td>
<td>Survey Criterion</td>
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<td>7. Graduates will be able to use programming languages such as C++, S, or Visual Basic</td>
<td>Internship Survey, Senior Survey and Post-Graduation Survey</td>
<td>Students on Internships, Seniors, and Graduates</td>
<td>Fall, Winter</td>
<td>Survey Criterion</td>
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<td>8. Graduates will be able to communicate results and solutions of mathematical, statistical, and actuarial problems in writing using everyday and mathematical language.</td>
<td>Internship Survey, Senior Survey and Post-Graduation Survey</td>
<td>Students on Internships, Seniors, and Graduates</td>
<td>Fall, Winter</td>
<td>Survey Criterion</td>
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<td>9. Graduates will be able to communicate mathematical and statistical solutions orally, using both everyday and mathematical language.</td>
<td>Internship Survey, Senior Survey and Post-Graduation Survey</td>
<td>Students on Internships, Seniors, and Graduates</td>
<td>Fall, Winter</td>
<td>Survey Criterion</td>
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