

Santiago Canyon College

Mathematics Department

**Math 150, Calculus for Biological,
Management, and Social Sciences**

Fall 2013

Student Learning Outcome Assessment

Fall 2013

Math 150, Calculus for Biological, Management, and Social Sciences

Catalog Entry:

Single and multi-variable calculus including limits, derivatives, integrals, exponentials and logarithmic functions and partial derivatives. Applications are drawn from Biology, Social Science and Business.

Course Purpose:

The student will learn the major topics in calculus through applications that are useful in the biological, management, and social sciences. In order to give a more realistic approach, calculators and/or computers will be used in their solutions. Broad concepts will be mastered instead of specialized manipulative skills. The student should have a clear idea of how calculus can be used as a tool in his/her chosen field of study.

Student Learning Outcomes:

1. Apply appropriate critical thinking, analytical reasoning and problem solving techniques to model real world contexts in the fields of Business, Economics, Social Sciences and Biology.
2. Solve problems using differentiation and integration of single- and multi-variable calculus.
3. Interpret and communicate mathematical results (from models in fields mentioned in "A") in a clear, accurate and professional manner.
4. Analyze the results of modeling real world data and contrast interpolative and extrapolative barriers to their application.

COURSE SLO ASSESSMENT REPORT, SCC

Department: Mathematics Course: Math 150, Calculus for Biological, Management, and Social Sciences
 Year: 2013 Semester: Fall

1) Outcome to be assessed	2) Means of assessment and criteria of success	3) Summary of data collected	4) Analysis of data	5) Plan of action/what to do next																																								
<p>SLO4</p> <p>Analyze the results of modeling real world data and contrast interpolative and extrapolative barriers to their application.</p>	<p>For Fall 2013 finals, score the embedded question using a five-point rubric. A score of 3, 4, or 5 indicates success</p> <p>For the courses, a cumulative score of 70% on the SLO indicates success.</p>	<p>A total of 70 final exams from Fall 2013 were scored.</p> <p>a</p> <table border="1" data-bbox="821 699 1119 777"> <tr><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr><td>9</td><td>30</td><td>18</td><td>8</td><td>5</td></tr> </table> <p>b</p> <table border="1" data-bbox="821 852 1119 930"> <tr><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr><td>7</td><td>5</td><td>17</td><td>21</td><td>20</td></tr> </table> <p>c</p> <table border="1" data-bbox="821 1005 1119 1083"> <tr><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr><td>5</td><td>4</td><td>14</td><td>20</td><td>27</td></tr> </table> <p>d</p> <table border="1" data-bbox="821 1157 1119 1235"> <tr><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr><td>5</td><td>8</td><td>19</td><td>21</td><td>17</td></tr> </table>	5	4	3	2	1	9	30	18	8	5	5	4	3	2	1	7	5	17	21	20	5	4	3	2	1	5	4	14	20	27	5	4	3	2	1	5	8	19	21	17	<p>50.4% of the students' responses scored 3, 4, or 5 on these questions asking for interpretation of previously computed results.</p> <p>Results on this question are interesting; part a asked for the marginal cost, and part b asked for the average cost. Clearly, the students did not perform as well as we would have liked on computing average cost.</p> <p>Parts c and d asked to compare and interpret, again the students did not do as well as we would like.</p> <p>Papers scored 1 were either blank or demonstrated no understanding or effort.</p>	<p>) Inform department of results</p> <p>2) Include results in information disseminated to Math 150 instructors in subsequent semesters.</p> <p>3) Discuss imbedded assessment with Math 150 faculty before, during, and after the semester.</p> <p>4) Choose a question that more directly addresses the SLO being assessed.</p>
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**MATH 150 CALCULUS FOR BIOLOGICAL, MANAGEMENT, AND SOCIAL SCIENCES, FALL 2013,
SLO ASSESSMENT**

FIVE-POINT RUBRIC

<http://www.mvhs.fuhsd.org/i-heng_mccomb/par/writing/general/hhsdept/am.htm>

5 EXEMPLARY; COMPLETE UNDERSTANDING

- Work at a very high level of proficiency.
- Clear, insightful, thorough, discerning and demonstrates an in-depth understanding.
- Polished, refined and consistently well-crafted.
- Contains no significant factual errors.

4 THOUGHTFUL; CLEAR UNDERSTANDING

- Work at an above average competency level.
- Work shows thoughtful grasp of the content studied.
- Contains illustrative material that is supportive.
- Contains no significant factual errors.

3 DEVELOPING; LITERAL

- Work at an average competency level.
- Demonstrates a grasp of the whole, but is simplistic or literal.
- Some effort evident, yet it does not meet all specifications of the challenge.
- Contains some factual errors that represent a flawed understanding of the topic

2 LIMITED; BARELY ACCEPTABLE

- Work barely meets the basic requirements of the challenge.
- Work shows minimal understanding of the content's key ideas.
- Limited and is carried out with little commitment to precision and excellence.
- Contains significant factual errors.

1 MINIMAL; UNACCEPTABLE

- Work at a very low competency level.
- Little or no understanding of the challenge or the task.
- Disjointed and unorganized.
- Contains many significant factual errors.

Assessment Cycle – Math 150, Calculus for Biological, Management, and Social Sciences

All SLOs should be assessed at least once within a three-year cycle. A complete assessment cycle includes: gathering assessment data, analyzing assessment data, sharing results within the department or discipline, and reporting results. In the matrix below, indicate the term in which each of your course SLOs will be assessed (inclusive of the entire assessment cycle).

SLO	Data Gathered	Data Analyzed	Data Shared Improvement Dialogue	Results Reported	Changes Implemented
SLO 1 Apply appropriate critical thinking, analytical reasoning and problem solving techniques to model real world contexts in the fields of Business, Economics, Social Sciences and Biology.	Fall 2014	Spring 2015	Spring 2015	Spring 2015	Fall 2015
SLO 2 Solve problems using differentiation and integration of single- and multi-variable calculus.	Fall 2015	Spring 2016	Spring 2016	Spring 2016	Fall 2016
SLO 3 Interpret and communicate mathematical results (from models in fields mentioned in “A”) in a clear, accurate and professional manner.	Fall 2012	Spring 2013	Spring 2013	Spring 2013	Fall 2013
SLO 4 Analyze the results of modeling real world data and contrast interpolative and extrapolative barriers to their application.	Fall 2013	Spring 2014	Spring 2014	Spring 2014	Fall 2014