UNIVERSITY OF ARKANSAS
PULASKI TECH

Assessment Report:
2018-2019
Due to Chair/Program Director and Assessment Coordinator by September 4th

Course-Level Learning Outcomes

1. What are the Course-Level Outcomes (CLOs)?

Student Learning / Course Outcomes

SLO #1: Students will calculate rates of change and limits; know the definition of a limit.

SLO #2: Students will calculate the derivative of a function using the definition, differentiation rules and formulas.

SLO #3: Students will recognize functions that are not differentiable.

SLO #4: Students will apply various techniques of integration. Evaluate indefinite and definite integrals using the various techniques of integration.

SLO #5: Students will use differentiation and integration techniques to solve problems in the management sciences and economics; use the calculator to solve these problems.

2. Which CLOs were addressed for this academic year? (2018-2019)

All Student Learning Outcomes were assessed for academic year 2018 - 2019

3. Which CLOs are being addressed in your assessment plan next academic year? (2019-2020)

All Student Learning Outcomes were assessed for academic year 2018 - 2019

4. Explain the assessment cycle.

Students in the course are given a common final exam at the conclusion of each semester to ensure mastery of the student learning outcomes for the course. The results are tabulated and a discussion occurs with the course level instructors to analyze the results. Decisions are made only after thorough discussions and validity of results analyzed in more than one semester to ensure consistency.

5. What are the assessment methods? Are they direct or indirect?

The assessment for this course is a direct measure using a common final exam for all sections and students in the course during each semester. The final exam is a paper/pencil assessment given in a proctored environment to ensure the integrity of the assessment.

6. What are the assessment goal(s)?

To ensure mastery within the course, our goal is a 70% threshold for each student learning outcome. This may be raised in future semesters once we have established a baseline for the course.

7. What were the findings for this academic year? (2018-2019)

SLO #1: Students will calculate rates of change and limits; know the definition of a limit.
Fall 2018
70.41% overall success rate
68.57% Face to Face
73.11% Online
Spring 2019
73.95% Overall
76.19% Face to Face
71.96 % Online

SLO #2: Students will calculate the derivative of a function using the definition, differentiation rules and formulas.
Fall 2018
Overall Success: 72.79%
Online Success: 73.95%
Face to Face: 72.00%
Spring 2019
Face to Face: 64.88%
Online: 67.72%
All: 66.39%

SLO #3: Students will recognize functions that are not differentiable.
Fall 2018
92.86% Overall
88.24% Online
96.00% Face to Face
Spring 2019
78.43% Overall
75% Face to Face
81.48% Online

SLO #4: Students will apply various techniques of integration. Evaluate indefinite and definite integrals using the various techniques of integration.
Fall 2018
Overall 65.71%
Online: 74.12%
Face to Face: 60%
Spring 2019
67.45% Overall
68.15% Online
66.67% Face-to-Face

SLO #5: Students will use differentiation and integration techniques to solve problems in the management sciences and economics; use the calculator to solve these problems.
Fall 2018
Overall: 71.43%
Online: 75.00%
Face to Face: 69.00%
Spring 2019
74% Overall
68% Online
80% Face to Face

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8. What is your analysis of the findings?

SLO #1: Students will calculate rates of change and limits; know the definition of a limit.

Fall 2018

Analysis of Results: All instructors of Business Calculus (traditional face to face and online sections) used the common 25 item multiple choice final exam. Questions 1,2,3,9,10,18, and 19 were used to measure SLO #1: The student will calculate rates of change and limits; know the definition of a limit. Students were allowed to use a formula sheet provided by the individual instructor and a TI-83/84/86 graphing calculator. No other resources were allowed on the final exam assessment. Questions were graded as correct or incorrect (no partial credit). A total of 42 of 70 (60%) of all students completed the final exam assessment. A total of 25 of 35 ((71%) traditional face to face and 17 of 35 (49%) of online students completed the final exam assessment. Questions 18 and 19 had an average less than 70% for the online section and questions 9 and 19 had less than 70% for face to face sections. Questions 18 and 19 involved correctly reading a graph to find the limit of a function and discuss continuity.

Spring 2019

Analysis of Results: All instructors of Business Calculus (traditional face to face and online sections) used the common 25 item multiple choice final exam. Questions 1-4, 9,10,18, and 19 were used to measure SLO #1: The student will calculate rates of change and limits; know the definition of a limit. Students were allowed to use a formula sheet provided by the individual instructor and a TI-83/84/86 graphing calculator. No other resources were allowed on the final exam assessment. Questions were graded as correct or incorrect (no partial credit). A total of 51 of 77 (66%) of all students completed the final exam assessment. A total of 24 of 35 ((69%) traditional face to face and 27 of 42 (64%) of online students completed the final exam assessment. Question 3 (60.78%) had an average of less than 70% among all sections. This question involved calculating limits using a different method other than direct substitution. These results were significantly less than the Fall 2018 average of 76.19%. Question 19 (54.90%) had an average of less than 70% among all sections. This question involved correctly reading a graph to find the limit of a function and discuss continuity. These results showed an improvement over Fall 2018 average of 47.62%

SLO #2: Students will calculate the derivative of a function using the definition, differentiation rules and formulas.

Fall 2018

Analysis of Results: All instructors of Business Calculus (traditional face to face and online sections) used the common 25 item multiple choice final exam. Questions 4,5,6,7,20,21, and 25 were used to measure SLO #2: "The student will calculate the derivative of a function using the definition, differentiation rules and formulas. Students were allowed to use a formula sheet provided by the individual instructor and a TI-83/84/86 graphing calculator. No other resources were allowed on the final exam assessment. Questions were graded as correct or incorrect (no partial credit). A total of 42 of 70 (60%) of all students completed the final exam assessment. A total of 25 of 35 ((71%) traditional face to face and 17 of 35 (49%) of online students completed the final exam assessment. Questions 6,7, and 25 had an average less than 70% for the online section and questions 7,20,21, and 25 had less than 70% for face to face sections.

Question #6 Involved the use of the quotient rule to find the derivative

Question #7 Involved the use of the chain rule to find the derivative

Question #20 Involved the use of the exponential function to find the derivative

Question #21 Involved the use of the logarithmic function to find the derivative

Question #25 had the lowest success rate which covers absolute extrema (max and min). The other questions were pretty consistent across the board.

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Spring 2019

Analysis of Results: All instructors of Business Calculus (traditional face to face and online sections) used the common 25 item multiple choice final exam. Questions 4,5,6,7,20,21, and 25 were used to measure SLO #2: "The student will calculate the derivative of a function using the definition, differentiation rules, and formulas. Students were allowed to use a formula sheet provided by the individual instructor and a TI-83/84/86 graphing calculator. No other resources were allowed on the final exam assessment. Questions were graded as correct or incorrect (no partial credit).
A total of 51 of 77 (66%), which is an increase of 6% from Fall 2018 of all students completed the final exam assessment. A total of 24 of 35 ((69%) traditional face to face and 27 of 42 (64%) of online students completed the final exam assessment. Questions 6,7, 20, 21, and 25 had an average of less than 70% for all sections.
Question #6 Involved the use of the quotient rule to find the derivative decreased from 66% to 59%
Question #7 Involved the use of the chain rule to find the derivative increased from 57% to 67%
Question #20 Involved the use of the exponential function to find the derivative decreased from 76% to 55%
Question #21 Involved the use of the logarithmic function to find the derivative decreased from 69% to 59%
Question #25 had the lowest success rate which covers absolute extrema (max and min). decreased from 55% to 43%

SLO #3: Students will recognize functions that are not differentiable.
Fall 2018

Analysis of Results All instructors of Business Calculus (traditional face to face and online sections) used the common 25 item multiple choice final exam. Question #8 was used to measure SLO #3: The student will recognize functions that are not differentiable. Students were allowed to use a formula sheet provided by the individual instructor and a TI-83/84/86 graphing calculator. No other resources were allowed on the final exam assessment. Questions were graded as correct or incorrect (no partial credit). A total of 42 of 70 (60%) of all students completed the final exam assessment. A total of 25 of 35 ((71%) traditional face to face and 17 of 35 (49%) of online students completed the final exam assessment. Question 8 had an average of 88% for the online section and 96% for face to face sections. Question 8 involved finding the slope of a tangent line. It is possible that the students simply memorized the answer for this question from the study guide since it was one of the exact same questions.

Spring 2019

Analysis of Results: All instructors of Business Calculus (traditional face to face and online sections) used the common 25 item multiple choice final exam. Question #8 was used to measure SLO #3: The student will recognize functions that are not differentiable. Students were allowed to use a formula sheet provided by the individual instructor and a TI-83/84/86 graphing calculator. No other resources were allowed on the final exam assessment. Questions were graded as correct or incorrect. A total of 51 of 77 (66%), which is an increase of 6% from Fall 2018 of all students completed the final exam assessment. A total of 24 of 35 ((69%) traditional face to face and 27 of 42 (64%) of online students completed the final exam assessment. Question 8 had an average of 81% which is a decrease of 7% from Fall 2018 for the online section and 75% which is a decrease of 21% from Fall 2018 for face to face sections. In Fall 2018 it was noted that for question 8 (finding the slope of a tangent line), students possibly memorized the answer for this question from the study guide since it was one of the exact same questions. Adding additional study guide questions for this SLO limited the opportunity for memorization.

SLO #4: Students will apply various techniques of integration. Evaluate indefinite and definite integrals using the various techniques of integration.

Fall 2018

Analysis of Results: A total of 42 of 70 (60%) of all students completed the final exam assessment. A total of 25 of 35 ((71%) traditional face to face and 17 of 35 (49%) of online students completed the final exam assessment. Question 24 had an average less than 70% for the online section and questions 14,15,22, and 24 had less than 70% for face to face sections. There was a significant difference between the traditional face to face and online section. This is the last chapter covered in the course, so there may not have been enough time in the face to face section to thoroughly cover the topic. Students in the online section typically are self-pace and will complete the entire course on their own. Question 24 involved correctly reading a graph to find the area between the curve. This question was the lowest probably due to a number of factors. During our faculty meeting it was discovered that the instructor did not have the latest version on the final exam where question 24 was changed. This question was more challenging then the question on the study guide .

Spring 2019

Analysis of Results: A total of 51 of 77 (66%), which is an increase of 6% from Fall 2018 of all students completed the final exam assessment. A total of 24 of 35 ((69%) traditional face to face and 27 of 42 (64%) of online students completed the final exam assessment. Questions 13 - 15, 22, and 24 were used to measure SLO #4, students will apply various techniques of integration. Evaluate indefinite and definite integrals using the various techniques of integration.

Question 13 overall was 94% (met)

Question 14 overall 73% (met)

Question 15 overall 53% (not met) (decreased by 23%): 59% Online and 49% face to face (Definite integral of exponential function)

Question 22 Overall 82% (met)

Question 24 Overall 34% (not met) (increased by 4% from Fall 2018): 41% Online and 29% Face to face (Area between curves)

SLO #5: Students will use differentiation and integration techniques to solve problems in the management sciences and economics; use the calculator to solve these problems.

Fall 2018

Analysis of Results: All instructors of Business Calculus (traditional face to face and online sections) used the common 25 item multiple choice final exam. Questions 11, 16, 17, and 23 were used to measure SLO #5: "The student will use differentiation and integration techniques to solve problems in the management sciences and economics; use the calculator to solve these problems. Students were allowed to use a formula sheet provided by the individual instructor and a TI-83/84/86 graphing calculator. No other resources were allowed on the final exam assessment. Questions were graded as correct or incorrect (no partial credit). A total of 42 of 70 (60%) of all students completed the final exam assessment. A total of 25 of 35 ((71%) traditional face to face and 17 of 35 (49%) of online students completed the final exam assessment. Question 16 had an average less than 70% for the online section and questions 11 and 16 had less than 70% for face to face sections. Question 16 involved finding the maximum profit (application problem) which correlates to finding the maximum and minimum for a function (question 25) which also had a low pass rate.

Spring 2019

Analysis of Results: A total of 51 of 77 (66%), which is an increase of 6% from Fall 2018 of all students completed the final exam assessment. A total of 24 of 35 ((69%) traditional face to face and 27 of 42 (64%) of online students completed the final exam assessment. Questions 11, 16, 17, and 23 were used to measure SLO #5, students will use differentiation and integration techniques to solve problems in the management sciences and economics; use the calculator to solve these problems.

Question 11 overall was 75% (met)

Question 16 overall 39% (not met) (decreased by 3%) 30% online and 50% face to face.

Question 17 overall 82% (met)

Question 23 Overall 98% (met)

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9. What is the action plan for the next academic year? (2019-2020) Explain.

SLO #1: Students will calculate rates of change and limits; know the definition of a limit.
Action: Fall 2018 is the first semester for faculty to utilize a common set of homework question in MyLabsPlus and adopted a new textbook. Faculty discussed splitting the first chapter of the text into two exams to focus more on the limit and continuity questions (#18 and 19) for Spring 2019. No changes to assessment for Spring 2019. We will continue to monitor questions 18 and 19. (01/31/2019). Final exam study guides will be created for each chapter to help students focus on weakness. Versions of the study guide will be in MyLabsPlus and students will have a paper version for practice. The study guide will be available by April 2019 (02/08/2019). This SLO has been met for Spring 2019, therefore no action is required. Faculty will meet at the beginning of Fall 2019 to discuss any additional changes for the Fall 2019 semester. Based on Spring 2019 meetings, Final Exam Study guides for each chapter have been uploaded into MyLabsPlus for use in Fall 2019. Although the study guides were added late last semester, instructors did not require students to complete them. Will work on an updated paper version of the final exam study guide (05/14/2019)

SLO #2: Students will calculate the derivative of a function using the definition, differentiation rules and formulas.
Action: Although 70% mastery was met for this SLO, we will continue to monitor success. Fall 2018 is the first semester for faculty to utilize a common set of homework question in MyLabsPlus and adopted a new textbook. Most of these questions are covered in the first chapter. Faculty discussed splitting the first chapter of the text into two exams to focus more on the derivative rules covered in chapter 1 for Spring 2019. No changes to assessment for Spring 2019. We will continue to monitor questions #25 since it had the lowest success rate. We will add more questions to the final exam study guide to provide more questions for the students to practice. (01/31/2019) The threshold for this SLO was met Fall 2018, but not met this semester, Spring 2019. Faculty will meet at the beginning of Fall 2019 to discuss and examine each question that showed a decrease from Fall 2018 and any additional changes for the Fall 2019 semester. Based on Spring 2019 meetings, Final Exam Study guides for each chapter have been uploaded into MyLabsPlus for use in Fall 2019. Although the study guides were added late last semester, instructors did not require students to complete them. Will work on an updated paper version of the final exam study guide (05/14/2019)

SLO #3: Students will recognize functions that are not differentiable.
Fall 2018
Action Although 70% mastery was met for this SLO, we will continue to monitor success. There was only one question for this SLO and it is identical to study guide question. Fall 2018 is the first semester for faculty to utilize a common set of homework question in MyLabsPlus and adopted a new textbook. This question was covered in the first chapter. No changes to assessment for Spring 2019. Since this question had a success rate well above 70% we will add more questions to the final exam study guide to provide more questions for the students to practice and not "give away" the final exam question. (01/31/2019). Final exam study guides will be created for each chapter to help students focus on weakness. Versions of the study guide will be in MyLabsPlus and students will have a paper version for practice. The study guide will be available by April 2019 (02/08/2019)

Spring 2019
Action This SLO has been met, therefore no action is required. Faculty will meet at the beginning of Fall 2019 to discuss any additional changes for the Fall 2019 semester. Based on Spring 2019 meetings, Final Exam Study guides for each chapter have been uploaded into MyLabsPlus for use in Fall 2019. Although the study guides were added late last semester, instructors did not require students to complete them. Will work on an updated paper version of the final exam study guide. No changes to assessment for Spring 2019 (05/15/2019).

SLO #4: Students will apply various techniques of integration. Evaluate indefinite and definite integrals using the various techniques of integration.

Fall 2018
Action 70% mastery was not met for this SLO. Fall 2018 is the first semester for faculty to utilize a common set of homework question in MyLabsPlus and adopted a new textbook. No changes to assessment for Spring 2019. We will continue to monitor questions #24 since it had the lowest success rate. We will add more questions to the final exam study guide to provide more questions for the students to practice. We will make sure all faculty members teaching the course will have the updated version of the final exam. We will continue to monitor this assessment question. No changes to assessment for Spring 2019 (01/31/2019). Final exam study guides will be created for each chapter to help students focus on weakness. Versions of the study guide will be in MyLabsPlus and students will have a paper version for practice. The study guide will be available by April 2019 (02/08/2019)

Spring 2019
Action: The threshold for this SLO was not met Spring 2019 but showed an increase in success by 2%. Faculty will meet at the beginning of Fall 2019 to discuss and examine each question that showed a decrease from Fall 2018 and any additional changes for the Fall 2019 semester. Based on Spring 2019 meetings, Final Exam Study guides for each chapter have been uploaded into MyLabsPlus for use in Fall 2019. Although the study guides were added late last semester, instructors did not require students to complete them. Will work on an updated paper version of the final exam study guide. Possibly discuss using a simpler question for #24 and reinforce question 15. (05/15/2019)

SLO #5: Students will use differentiation and integration techniques to solve problems in the management sciences and economics; use the calculator to solve these problems.
Fall 2018
Action: Although 70% mastery was met for this SLO, we will continue to monitor success. Fall 2018 is the first semester for faculty to utilize a common set of homework question in MyLabsPlus and adopted a new textbook. No changes to assessment for Spring 2019. We will continue to monitor questions 16 and 25 and discuss improvements (01/31/2019). Final exam study guides will be created for each chapter to help students focus on weakness. Versions of the study guide will be in MyLabsPlus and students will have a paper version for practice. The study guide will be available by April 2019 (02/08/2019)

Spring 2019
Action This SLO has been met, therefore no action is required. Faculty will meet at the beginning of Fall 2019 to discuss any additional changes for the Fall 2019 semester. Based on Spring 2019 meetings, Final Exam Study guides for each chapter have been uploaded into MyLabsPlus for use in Fall 2019. Although the study guides were added late last semester, instructors did not require students to complete them. Will work on an updated paper version of the final exam study guide. No changes to assessment for Spring 2019. We will continue to monitor question 16 and discuse how to improve these results. (05/15/2019)