

Course Student Learning Outcomes Assessment

MATH 280 Intermediate Calculus

**Created on: 09/17/2013 02:56:00 PM PST
Last Modified: 03/11/2015 08:54:02 AM PST**

Table of Contents

General Information	1
Standing Requirements	2
Course Description.....	2
Course Student Learning Outcomes.....	2
2014-2015 Assessment Cycle	3
Measurements.....	3
Findings.....	3
Plans of Action.....	4
Status Reports.....	4
2013-2014 Assessment Cycle	5
Measurements.....	5
Findings.....	5
Plans of Action.....	6
Status Reports.....	6
2012-2013 Assessment Cycle	7
Measurements.....	7
Findings.....	7
Plans of Action.....	8
Status Reports.....	8

General Information (Course Student Learning Outcomes Assessment)

Standing Requirements

📖 Course Description

Vectors and three-dimensional space functions of several variables partial derivatives and multiple integrals. Vector calculus Green's Theorem Stoke's Theorem and the Divergence Theorem.

📖 Course Student Learning Outcomes

MATH 280 Intermediate Calculus Outcome Set

Outcome	
Outcome	Mapping
Outcome 1 State and apply basic definitions, properties and theorems of multivariable Calculus.	Institutional Student Learning Outcomes: Act 3, Communicate 1, Communicate 2, Communicate 3, Learn 2, Think 1, Think 2
Outcome 2 Apply vector operations in two and three dimensions and use vector methods to analyze plane and space curves, and curvilinear motion.	Institutional Student Learning Outcomes: Act 3, Communicate 1, Communicate 2, Communicate 3, Learn 2, Think 1, Think 2
Outcome 3 Apply standard techniques of multivariable differentiation and integration to solve application problems.	Institutional Student Learning Outcomes: Act 3, Communicate 1, Communicate 2, Communicate 3, Learn 1, Learn 2, Think 1, Think 2

2014-2015 Assessment Cycle

Measurements

Outcomes and Measures

MATH 280 Intermediate Calculus Outcome Set

Outcome

Outcome 3

Apply standard techniques of multivariable differentiation and integration to solve application problems.

▼ **Measure:** Math 280 - SLO 3 - Fall 2014
Course level; Direct - Exam

Description of Measurement Tool: Students are given a final exam prepared by each teacher, and a Stokes' Theorem application is scored using a rubric scale from 0-4:

- 4 - Exemplary, complete understanding
- 3 - Thoughtful, clear understanding
- 2 - Developing, literal
- 1 - Limited, barely acceptable
- 0 - Minimal, unacceptable

Criteria for Success: Individual & Collective Student Criterion: Individually, success is defined as earning a score of 2, 3, or 4 on the rubric. Collectively, success is defined as 70% of students achieving individual success.

Cycle of Assessment: This outcome is assessed every three years.

For this report, the data was gathered in Fall 2014, collated, analyzed, reported, and discussed in Spring 2015, with recommendations implemented in Fall 2015.

Who is Responsible for Assessment Activity?: The Math 280 coordinator of record for 2014-2015, Randy Scott, is responsible for the assessment.

Findings

Finding per Measure

MATH 280 Intermediate Calculus Outcome Set

Outcome

Outcome 3

Apply standard techniques of multivariable differentiation and integration to solve application problems.

▼ **Measure:** Math 280 - SLO 3 - Fall 2014
Course level; Direct - Exam

Description of Measurement Tool: Students are given a final exam prepared by each teacher, and a Stokes' Theorem application is scored using a rubric scale from 0-4:

- 4 - Exemplary, complete understanding
- 3 - Thoughtful, clear understanding
- 2 - Developing, literal
- 1 - Limited, barely acceptable
- 0 - Minimal, unacceptable

Criteria for Success: Individual & Collective Student Criterion: Individually, success is defined as earning a score of 2, 3, or 4 on the rubric. Collectively, success is defined as 70% of students achieving individual success.

Cycle of Assessment: This outcome is assessed every three years.

For this report, the data was gathered in Fall 2014, collated, analyzed, reported, and discussed in Spring 2015, with recommendations implemented in Fall 2015.

Who is Responsible for Assessment Activity?: The Math 280 coordinator of record for 2014-2015, Randy Scott, is responsible for the assessment.

Findings for Math 280 - SLO 3 - Fall 2014

Summary of Findings: The scores on the rubric were

0 - 0

1 - 11

2 - 17

3 - 8

4 - 4

29 of 40 students achieved success, for a collective score of 72.5%

Results: Criteria for Success Achievement Status: Met

Analysis of Findings: Math 280 students are the best and brightest on our campus. Both they and their professors expect success.

Recommendations: Keep up the good work.

Overall Recommendations

No text specified

Plans of Action

Status Reports

2013-2014 Assessment Cycle

Measurements

Outcomes and Measures

MATH 280 Intermediate Calculus Outcome Set

Outcome

Outcome 1

State and apply basic definitions, properties and theorems of multivariable Calculus.

▼ **Measure:** Math 280 SLO 1
Course level; Direct - Exam

Description of Measurement Tool: Students are given a departmental final with an embedded question pertaining to specific topics for this SLO. The rubric scale is from 1 - 5.

- 5 - Exemplary, complete understanding
- 4 - Thoughtful, clear understanding
- 3 - Developing, literal
- 2 - Limited, barely acceptable
- 1 - Minimal, unacceptable

Criteria for Success: Individual & Collective Student Criterion: Individually, success is earning a 3, 4, or 5 using the 5-point rubric. Collectively, success is defined as 70% of the class being individually successful.

Cycle of Assessment: This outcome will be assessed in the fall semester every three years.

For this report, the data was gathered in Fall 2013, collated, analyzed, reported, and discussed in Spring 2014, with recommendations implemented in Fall 2014.

Who is Responsible for Assessment Activity?: The Math 280 coordinator of record for 2013-2014, Randy Scott, is responsible for the assessment.

Findings

Finding per Measure

MATH 280 Intermediate Calculus Outcome Set

Outcome

Outcome 1

State and apply basic definitions, properties and theorems of multivariable Calculus.

▼ **Measure:** Math 280 SLO 1
Course level; Direct - Exam

Description of Measurement Tool: Students are given a departmental final with an embedded question pertaining to specific topics for this SLO. The rubric scale is from 1 - 5.

- 5 - Exemplary, complete understanding
- 4 - Thoughtful, clear understanding
- 3 - Developing, literal
- 2 - Limited, barely acceptable
- 1 - Minimal, unacceptable

Criteria for Success: Individual & Collective Student Criterion: Individually, success is earning a 3, 4, or 5 using the 5-point rubric. Collectively, success is defined as 70% of the class being individually successful.

Cycle of Assessment: This outcome will be assessed in the fall semester every three years.

For this report, the data was gathered in Fall 2013, collated, analyzed, reported, and discussed in Spring 2014, with recommendations implemented in Fall 2014.

Who is Responsible for Assessment Activity?: The Math 280 coordinator of record for 2013-2014, Randy Scott, is responsible for the assessment.

Findings for Math 280 SLO 1

Summary of Findings: Two sections of Math 280 were offered. A total of 50 randomly selected final exams from both sections were assessed. (n=50)

Score - # students - percentage

1 - 2 - 4.0%

2 - 4 - 8.0%

3 - 6 - 12.0%

4 - 22 - 44.0%

5 - 16 - 32.0%

Overall success rate: 88%

Results: Criteria for Success Achievement Status: Exceeded

Analysis of Findings: Our goal was exceeded with 88.0% of the students scoring 3, 4, or 5 on applying the properties of multivariable calculus to find a directional derivative and magnitude of the gradient vector.

Recommendations: There are no recommendations at this time.

Overall Recommendations

No text specified

Plans of Action

Status Reports

2012-2013 Assessment Cycle

Measurements

Outcomes and Measures

MATH 280 Intermediate Calculus Outcome Set

Outcome

Outcome 3

Apply standard techniques of multivariable differentiation and integration to solve application problems.

▼ **Measure:** Math 280, Spring 2013, SLO 3
Course level; Direct - Exam

Description of Measurement Tool: Score #2b on each final exam using a 5-point rubric. For Spring 2013, #2b was a problem asking the students to write a triple integral using cylindrical coordinates that gives the volume of a solid.

- 5 - Exemplary, complete understanding
- 4 - Thoughtful, clear understanding
- 3 - Developing, literal
- 2 - Limited, barely acceptable
- 1 - Minimal, unacceptable

Criteria for Success: Individual & Collective Student Criterion: Individually, success is earning a 3, 4, or 5 using the 5-point rubric. Collectively, success is defined as 70% of the class being individually successful.

Cycle of Assessment: This outcome will be assessed in the spring semester every three years. (2013, 2016, 2019, 2022)

For this report, the data was gathered in Spring 2013, collated, analyzed, reported, and discussed in Fall 2013, with recommendations implemented in Spring 2014.

Who is Responsible for Assessment Activity?: The course coordinator (for Spring 2013, Randy Scott) is responsible for administering the assessment.

Findings

Finding per Measure

MATH 280 Intermediate Calculus Outcome Set

Outcome

Outcome 3

Apply standard techniques of multivariable differentiation and integration to solve application problems.

▼ **Measure:** Math 280, Spring 2013, SLO 3
Course level; Direct - Exam

Description of Measurement Tool: Score #2b on each final exam using a 5-point rubric. For Spring 2013, #2b was a problem asking the students to write a triple integral using cylindrical coordinates that gives the volume of a solid.

- 5 - Exemplary, complete understanding
- 4 - Thoughtful, clear understanding
- 3 - Developing, literal
- 2 - Limited, barely acceptable
- 1 - Minimal, unacceptable

Criteria for Success: Individual & Collective Student Criterion: Individually, success is earning a 3, 4, or 5 using the 5-point rubric. Collectively, success is defined as 70% of the class being individually successful.

Cycle of Assessment: This outcome will be assessed in the spring semester every three years. (2013, 2016, 2019, 2022)

For this report, the data was gathered in Spring 2013, collated, analyzed, reported, and discussed in Fall 2013, with recommendations implemented in Spring 2014.

Who is Responsible for Assessment Activity?: The course coordinator (for Spring 2013, Randy Scott) is responsible for administering the assessment.

Findings for Math 280, Spring 2013, SLO 3

Summary of Findings: A total of 50 randomly selected final exams from 2 sections of Math 280 were scored using a 5-point rubric. For Spring 2013, 2.0% (1) of the students scored 1, 8.0% (4) scored 2, 12.0% (6) scored 3, 42.0% (21) scored 4, and 36.0% (18) scored 5.

Results: Criteria for Success Achievement Status: Exceeded

Analysis of Findings: 90.0% of the students scored a 3, 4, or 5 on writing an integral in cylindrical coordinates that gives the volume of a solid.

Although the students did well on this task, by the time the final exam rolls around, it is a pretty basic concept. In addition, the application is to the mathematical concept of volume.

Recommendations: 1. Inform department of results.
2. Include a question on the final exam that addresses this important SLO using an application from a field outside of mathematics.

Overall Recommendations

No text specified

 **Plans of Action**

 **Status Reports**