Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	176	MTH 176 01/26/2023-College Algebra
College	Division	Department
	Math, Science and Engineering Tech	Math & Engineering Studies
Faculty Preparer		Michael Quail
Date of Last Filed Assessment Report		10/18/2019

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

   Yes

   12/22/2020

2. Briefly describe the results of previous assessment report(s).

   Overall, our students were very successful in mastering the outcomes for this course. There was one area that continued to be difficult to make significant improvements - Outcome #4: Translate and solve linear, quadratic, rational, radical, exponential and logarithmic applications.

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

   Results of the previous assessment were shared with all mathematics faculty immediately. The final exam contained more applications and instructors of the course were encouraged to make positive improvement in that outcome. Additional applications were added to the final.

II. Assessment Results per Student Learning Outcome

Outcome 1: Solve linear, quadratic, polynomial, rational, radical, exponential and logarithmic equations and inequalities.

- Assessment Plan
  - Assessment Tool: Outcome-related common departmental exam questions

- Assessment Date: Fall 2022
- Course section(s)/other population: All sections
- Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.
- How the assessment will be scored: Departmentally-developed rubric
- Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.
- Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2022		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
333	20

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

I collected the common final exams from all instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I used a rubric: For each question, a score of 0 – 2 will be assigned based on the work provided by the student. 0: The student makes a little or no progress toward accomplishing the mathematical goal(s) of the problem.

1: The student achieves the main thrust of the mathematics behind the problem, but there is some minor misunderstanding of content or there may be errors in computation. Score of at least 70%. 2: The student fully achieves the mathematical goal(s). All work is complete and correct. Score of 100%. A score of 1 (>70%) is considered a passing score.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
85% of students (17/20) scored at least 70%. The standard of success was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Our students have good problem solving skills.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

When solving an application problem, some students have trouble identifying what mathematics they need to use.

Outcome 2: Graph linear, quadratic, polynomial rational, radical, exponential and logarithmic equations and inequalities.

- Assessment Plan
    - Assessment Tool: Outcome-related common departmental exam questions
    - Assessment Date: Fall 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.

- Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2022		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
333	20

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

I collected the common final exams from all instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I used a rubric: For each question, a score of 0 – 2 will be assigned based on the work provided by the student. 0: The student makes a little or no progress toward accomplishing the mathematical goal(s) of the problem. 1: The student achieves the main thrust of the mathematics behind the problem, but there is some minor misunderstanding of content or there may be errors in computation. Score of at least 70%. 2: The student fully achieves the mathematical goal(s). All work is complete and correct. Score of 100%. A score of 1 (>70%) is considered a passing score.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
100% of students (20/20) scored at least 70%. The standard of success was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Our students are exceptional when asked to transform a function, even when given an unknown function.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Split domain problems continue to be an issue, but this assessment showed some improvement. Identifying holes in graph should be emphasized.

Outcome 3: Perform linear, quadratic, rational, radical, exponential and logarithmic functional operations.

- Assessment Plan
    - Assessment Tool: Outcome-related common departmental exam questions
    - Assessment Date: Fall 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.
    - Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2022		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
333	20

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

I collected the common final exams from all instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I used a rubric: For each question, a score of 0 – 2 will be assigned based on the work provided by the student. 0: The student makes a little or no progress toward accomplishing the mathematical goal(s) of the problem. 1: The student achieves the main thrust of the mathematics behind the problem, but there is some minor misunderstanding of content or there may be errors in computation. Score of at least 70%. 2: The student fully achieves the mathematical goal(s). All work is complete and correct. Score of 100%. A score of 1 (>70%) is considered a passing score.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
75% of students (15/20) scored at least 70%. The standard of success was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

An important component of College Algebra is to perform function operations. Our students are exceptionally strong in achieving this outcome.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Out of the four objectives assessed, the composition of functions had the lowest performance, with a score of 2.

Outcome 4: Translate and solve linear, quadratic, rational, radical, exponential and logarithmic applications.

- Assessment Plan
    - Assessment Tool: Outcome-related common departmental exam questions
    - Assessment Date: Fall 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.
    - Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2022		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
333	20

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students were assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

I collected the common final exams from all instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I used a rubric: For each question, a score of 0 – 2 will be assigned based on the work provided by the student. 0: The student makes a little or no progress toward accomplishing the mathematical goal(s) of the problem. 1: The student achieves the main thrust of the mathematics behind the problem, but there is some minor misunderstanding of content or there may be errors in computation. Score of at least 70%. 2: The student fully achieves the mathematical goal(s). All work is complete and correct. Score of 100%. A score of 1 (>70%) is considered a passing score.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
75% of students scored at least 70%. The assessment tool standard was met.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The results of this assessment were stronger since faculty emphasized the solving of applications. Eighty percent of our students were able to solve for the inverse function in the temperature application.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

When given an application they have not seen before, students have difficulties. We need more emphasis on looking for the key mathematical concepts in an application.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

It would appear that the changes had an effect: 75% of students in the current assessment, compared to 50% of students in the last assessment, achieved complete understanding of these types of problems.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

Overall this course is meeting the needs of students. Nothing surprising stood out.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

Results will be shared with the mathematics faculty. We will continue to work on improving all outcomes.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Assessment Tool	Switch to a scoring rubric with possible score of 0, 1 (>70%), and 2 (100%) and update the standard of success accordingly.	Continuous improvement: updated rubric in order to better assess student learning; align the standard of success to the rubric being used.	2022

5. Is there anything that you would like to mention that was not already captured?

6.

III. Attached Files

Item Analysis
Raw Data

Faculty/Preparer:	Michael Quail	**Date:** 01/27/2023
Department Chair:	Lisa Manoukian	**Date:** 02/08/2023
Dean:	Tracy Schwab	**Date:** 02/09/2023
Assessment Committee Chair:	Shawn Deron	**Date:** 03/13/2023

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	176	MTH 176 05/16/2021-College Algebra
College	Division	Department
	Math, Science and Engineering Tech	Math & Engineering Studies
Faculty Preparer		Michael Quail
Date of Last Filed Assessment Report		10/18/2019

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

   Yes

   07/18/2019

2. Briefly describe the results of previous assessment report(s).

   Our students were doing well. However, there was a drop in the percentage of students who were successful in outcome 4:

   Translate and solve linear, quadratic, rational, radical, exponential and logarithmic applications.

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

   The results of the assessment were shared with faculty. Additional application problems were added to the final exam so that we could better assess outcome 4.

II. Assessment Results per Student Learning Outcome

Outcome 1: Solve linear, quadratic, polynomial, rational, radical, exponential and logarithmic equations and inequalities.

- Assessment Plan
  - Assessment Tool: Outcome-related common departmental exam questions
  - Assessment Date: Fall 2022

- Course section(s)/other population: All sections
- Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.
- How the assessment will be scored: Departmentally-developed rubric
- Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.
- Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2020		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
327	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

The assessment plan indicates a random sample of all students would be assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Exams were collected from all instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

There were 11 questions administered on WebAssign to all students. WebAssign is an online software with answer blanks for students to submit their answers to linear, quadratic, polynomial, rational, radical, exponential and logarithmic equations and inequalities. The exam was scored as right or wrong with no partial credit.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
The percentage of successful responses on the 11 questions ranged from 58% to 93% with a combined average of 83%. Overall our students did very well but we need to look at two outliers: 58% and 71%.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Our students seem quite capable of solving a variety of equations with a few exceptions. However, with using an online assessment tool, it is difficult to determine if technology was used to obtain answers.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

We will move towards a written exam where we can better assess this outcome. To achieve this goal, having a Testing Center is paramount.

Outcome 2: Graph linear, quadratic, polynomial rational, radical, exponential and logarithmic equations and inequalities.

- Assessment Plan
    - Assessment Tool: Outcome-related common departmental exam questions
    - Assessment Date: Fall 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.
    - Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2020		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
327	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

The assessment plan indicates a random sample of all students would be assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Exams were collected from all instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

There were eight questions administered on WebAssign to all students. WebAssign is an online software with answer blanks for students to submit their answers to linear, quadratic, polynomial, rational, radical, exponential and logarithmic equations and inequalities. The exam was scored as right or wrong with no partial credit.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
The percentage of successful responses on the eight questions ranged from 53% to 91% with a combined average of 84%. Overall our students did very well but we need to look at two outliers: 53% and 71%.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Our students seem quite capable of graphing a variety of functions with a few exceptions. The use of technology has helped in mastering this outcome. The question is whether they are using technology with only a basic understanding of graphing techniques.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Design written question that measure basic graphing techniques.

Outcome 3: Perform linear, quadratic, rational, radical, exponential and logarithmic functional operations.

- Assessment Plan
    - Assessment Tool: Outcome-related common departmental exam questions
    - Assessment Date: Fall 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.
    - Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2020		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
327	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

The assessment plan indicates a random sample of all students would be assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Exams were collected from all instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

There were seven questions administered on WebAssign to all students. WebAssign is an online software with answer blanks for students to submit their answers to linear, quadratic, polynomial, rational, radical, exponential and logarithmic equations and inequalities. The exam was scored as right or wrong with no partial credit.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
The percentage of successful responses on the seven questions ranged from 74% to 95% with a combined average of 84%. Overall our students did very well. This outcome is one of the more important ones for students to master in order to move on to calculus.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Our students seem quite capable of performing function operations.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Focus on the operations where students had the lowest success rates.

Outcome 4: Translate and solve linear, quadratic, rational, radical, exponential and logarithmic applications.

- Assessment Plan
    - Assessment Tool: Outcome-related common departmental exam questions
    - Assessment Date: Fall 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.
    - How the assessment will be scored: Departmentally-developed rubric

- Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.
- Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2020		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
327	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

The assessment plan indicates a random sample of all students would be assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Exams were collected from all instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

There were four questions administered on WebAssign to all students. WebAssign is an online software with answer blanks for students to submit their answers to linear, quadratic, polynomial, rational, radical, exponential and logarithmic equations and inequalities. The exam was scored as right or wrong with no partial credit.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: No
The percentage of successful outcomes on the four questions ranged from 34% to 80% with a combined average of 50%. Overall our students did not reach the standard of success. The poor performance could be due to using WebAssign with

no partial credit. The plan is to attempt to bring back a written final exam as we did in the past to analyze all of our outcomes comprehensively.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

This is an area that almost all students struggle with. They have the mathematical skills to solve these as illustrated by the success rates in other outcomes.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

The problem areas are analyzing and translating the word problems to mathematics. This is an area that needs discussion within the department.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

There have been so many changes to how we teach and assess due to the pandemic, I think it is difficult to determine how effective the changes were.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

We seem to be doing an adequate job in most areas. I was surprised that the success rates did not change much from the last assessment.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

This report will be shared in a department meeting and conversations with part-time Math 176 instructors.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date

Assessment Tool	Use written exams if possible.	Written exams will help us better analyze the results and how we might make improvements.	2021
Course Assignments	Encourage faculty to look at weaknesses and find ways to improve success rates.	To address areas of the course with lower student performance.	2021

5. Is there anything that you would like to mention that was not already captured?

6.

III. Attached Files

2021 Mth 176 Assessment Data

Faculty/Preparer:	Michael Quail	**Date:** 07/05/2021
Department Chair:	Lawrence David	**Date:** 07/09/2021
Dean:	Victor Vega	**Date:** 07/20/2021
Assessment Committee Chair:	Shawn Deron	**Date:** 10/11/2022

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	176	MTH 176 07/18/2019-College Algebra
Division	Department	Faculty Preparer
	Mathematics	Michael Quail
Date of Last Filed Assessment Report		

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

   Yes

   2016

2. Briefly describe the results of previous assessment report(s).

   Overall, our students have been very successful in mastering the outcomes for this course. There are areas that seem to "haunt" us as to how to make improvements.

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

   Results of the previous assessment were shared with all mathematics faculty immediately. Adjustments to the final exam were implemented the semester following the assessment.

II. Assessment Results per Student Learning Outcome

Outcome 1: Solve linear, quadratic, rational, radical, exponential and logarithmic equations and inequalities.

- Assessment Plan
  - Assessment Tool: Outcome-related common departmental exam questions
  - Assessment Date: Fall 2022
  - Course section(s)/other population: All sections
  - Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.

- How the assessment will be scored: Departmentally-developed rubric
- Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.
- Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
291	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

I collected the common final exams from all Mth 176 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I used a rubric. The description is included on the attached spreadsheet 176 final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
84% of students displayed a broad or deep understanding of this type of problem.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The majority of our students are able to solve these type of equations. The graphing calculator has had a significant impact on student success of this outcome.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

We need to look at how much students depend on technology for finding solutions to problems.

Outcome 2: Graph linear, quadratic, rational, radical, exponential and logarithmic equations and inequalities.

- Assessment Plan
    - Assessment Tool: Outcome-related common departmental exam questions
    - Assessment Date: Fall 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.
    - Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
291	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

I collected the common final exams from all Mth 176 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I used a rubric. The description is included on the attached spreadsheet 176 final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
77% of students displayed a broad or deep understanding of this type of problem.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The majority of our students are able to graph these type of equations. The graphing calculator has had an even greater impact on student success of this outcome than for solving equations.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

We need to look at how much students depend on technology for finding solutions to problems.

Outcome 3: Perform linear, quadratic, rational, radical, exponential and logarithmic functional operations.

- Assessment Plan
    - Assessment Tool: Outcome-related common departmental exam questions
    - Assessment Date: Fall 2022
    - Course section(s)/other population: All sections

- Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.
- How the assessment will be scored: Departmentally-developed rubric
- Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.
- Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
291	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

I collected the common final exams from all Mth 176 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I used a rubric. The description is included on the attached spreadsheet 176 final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
81% of students displayed a broad or deep understanding of this type of problem.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The majority of our students are able to perform these operations.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Composition of functions continues to be an area we should address.

Outcome 4: Translate and solve linear, quadratic, rational, radical, exponential and logarithmic applications.

- Assessment Plan
    - Assessment Tool: Outcome-related common departmental exam questions
    - Assessment Date: Fall 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample of all students with a maximum of 100 students.
    - How the assessment will be scored: Departmentally-developed rubric
    - Standard of success to be used for this assessment: 70% of students must score at least 70% on the common exam questions.
    - Who will score and analyze the data: Full-time math faculty

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
291	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

I collected the common final exams from all Mth 176 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I used a rubric. The description is included on the attached spreadsheet 176 final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
73% of students displayed a broad or deep understanding of this type of problem.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Applying mathematics to applications is the area where our students struggle most.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

I will be working with Math 176 instructors to develop techniques for improving student success for all outcomes, but especially for the applications of mathematics.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

Adjustments to the final exam were implemented the semester following the assessment. These adjustments added clarity to the exam, so that students and faculty had a better idea as to what was being asked. The problem with making changes to improve student learning is there is no coordinated mechanism for initiating and creating changes to improve student success. It is my hope that we will come up with a plan to solve this problem.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

Overall this course is meeting the needs of our students. No surprises were found.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

Results will be reported back to the department as well as part-time faculty.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Course Assignments	Additional time/assignments to address composition of functions	This aspect of Outcome 3 had weaker performance than others.	2019
Course Assignments	Additional time/assignments to help students in applying mathematics to applications.	Applying mathematics to applications is the area where our students struggle the most.	2019
Other: Faculty Involvement	Meet with Math 176 instructors to brainstorm ways to improve those areas that we can improve student success.	Improving student success needs a coordinated involvement and effort by all instructors of the course.	2019
Other: Student dependence on technology	Investigate how much students depend on technology for finding solutions to problems.	It is important to understand this to fully grasp students' learning and problem-solving methods.	2019

5. Is there anything that you would like to mention that was not already captured?

6.

III. Attached Files

Math 176 final item analysis 2019

Faculty/Preparer:	Michael Quail	**Date:** 07/18/2019
Department Chair:	Lisa Manoukian	**Date:** 07/22/2019
Dean:	Victor Vega	**Date:** 09/27/2019
Assessment Committee Chair:	Shawn Deron	**Date:** 10/18/2019

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	176	MTH 176 07/04/2016-College Algebra
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Mathematics	Michael Quail
Date of Last Filed Assessment Report		

I. Assessment Results per Student Learning Outcome

Outcome 1: Solve equations and inequalities.

- Assessment Plan
    - Assessment Tool: Common departmental exam questions for all outcomes given to all students and scored for a random sampling of students with a written report and analysis of results every three years.
    - Assessment Date: Fall 2008
    - Course section(s)/other population: All sections
    - Number students to be assessed: Number of students to be assessed is 100
    - How the assessment will be scored: Common exam questions will be collected and scored for all students by a subcommittee of the full time faculty
    - Standard of success to be used for this assessment: 70% of students who earned a transferable grade must score at least 70% on the common exam questions.
    - Who will score and analyze the data: A subcommittee of the full time math faculty.

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2015		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed

407	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample was used for assessment.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All final exams were collected from the MTH 176 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I collected data on four types of problems that involve solving equations.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
A) Solving Polynomial Equations: The majority of our students are able to solve these type of equations. The use of a calculator has improved the students' understanding of this type of problem. B) Solving Exponential Equations - 1: This type of problem involves solving an exponential equation that contains a quadratic equation within the steps of finding the solution. Many of our students had trouble solving this type of equation. A common difficulty was the inability to find both answers to the equation. Further, it required them to have a conceptual understanding of the problem. C) Solving Exponential Equations - 2: This type of exponential equation involved a much simpler approach where the student had to use a calculator for the final step in the solution. It required them to understand the relationship between the exponential and logarithmic equations. Our students were much more successful with this problem. D) Solving Nonlinear Systems: This problem can be solved in different ways involving working with two equations. The results show that this is an area of concern that instructors need to take a close look at for making changes.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Most students seem to be confident in their ability to solve equations. Polynomial functions are the most important type of function for future work in mathematics.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Some students had difficulty solving equations that contain more than one type of function.

Outcome 2: Graph equations and inequalities.

- Assessment Plan
    - Assessment Tool: Common departmental exam questions for all outcomes given to all students and scored for a random sampling of students with a written report and analysis of results every three years.
    - Assessment Date: Fall 2008
    - Course section(s)/other population: All sections
    - Number students to be assessed: Number of students to be assessed is 100
    - How the assessment will be scored: Common exam questions will be collected and scored for all students by a subcommittee of the full time faculty.
    - Standard of success to be used for this assessment: 70% of students who earn a transferable grade must score at least 70% on the common exam questions.
    - Who will score and analyze the data: A subcommittee of the full time math faculty.

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2015		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed

407	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample was used for assessment.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All final exams were collected from the MTH 176 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I collected data on two types of problems that involve graphing equations and inequalities.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
A) Graphing Equations: Students were asked to graph a quadratic equation. Our students were exceptionally successful in graphing this type of function. B) Graphing Inequalities: Students were asked to graph a split domain function. Our students were reasonably successful in graphing inequalities. There were minor issues in determining the inclusion of the endpoints and location of each function. A number of students graphed the inequalities backwards.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Most students seem to be confident in their ability to graph simple equations.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Some students had difficulty in solving split domain functions.

Outcome 3: Perform functional operations.

- Assessment Plan
    - Assessment Tool: Common departmental exam questions for all outcomes given to all students and scored for a random sampling of students with a written report and analysis of results every three years.
    - Assessment Date: Fall 2008
    - Course section(s)/other population: All sections
    - Number students to be assessed: Number of students to be assessed is 100
    - How the assessment will be scored: Common exam questions will be collected and scored for all students by a subcommittee of the full time faculty
    - Standard of success to be used for this assessment: 70% of students who earn a transferable grade must score at least 70% on the common exam questions.
    - Who will score and analyze the data: A subcommittee of the full time math faculty.

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2015		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
407	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample was used for assessment.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All final exams were collected from the MTH 176 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I collected data on two types of problems that involve performing function operations.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
A) Composition of Functions: Students have a good grasp on composition of functions but often had trouble with the directions of simplifying their answer. Some students factored the solution and others thought they should solve the expression by setting it equal to 0 and solving it. B) Multiplication of Functions: Students have a good grasp on the multiplication of functions but as with composition they often had trouble with the directions of simplifying their answer. Some students factored the solution and others thought they should solve the expression by setting it equal to 0 and solving it. Note that some students often were confused as to which of two operations to perform. The symbols used in our textbook are similar looking. Some clarification on the assessment tool might clarify the confusion.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Most students understand the difference between composition and multiplication despite the similar looking symbols.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

A significant number of students have trouble with simplifying an expression.

Outcome 4: Translate and solve applications.

- Assessment Plan
    - Assessment Tool: Common departmental exam questions for all outcomes given to all students and scored for a random sampling of students with a written report and analysis of results every three years.
    - Assessment Date: Fall 2008
    - Course section(s)/other population: All sections

- Number students to be assessed: Number of students to be assessed is 100
- How the assessment will be scored: Common exam questions will be collected and scored for all students by a subcommittee of the full time faculty.
- Standard of success to be used for this assessment: 70% of students who earn a transferable grade must score at least 70% on the common exam questions.
- Who will score and analyze the data: A subcommittee of the full time math faculty.

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2015		

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
407	100

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample was used for assessment.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All final exams were collected from the MTH 176 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

I collected data on two types of problems that involve solving applications.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
A) Basic Computation Application: Students have an excellent grasp on substituting values into an exponential growth equation. Rounding at times was

an issue for many students. A population should not have one-half of a person or bacteria.

B) Application Using Algebraic Techniques: Students are able to set these problems up adequately but some students struggle completing the steps and finding the solution with their calculator. Rounding again was an issue.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Almost all of our students can successfully solve a basic application that consists of substituting values into an equation.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Some students have difficulty in performing algebraic techniques on an equation. Correctly rounding an answer is also an issue.

II. Course Summary and Action Plans Based on Assessment Results

1. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

This course seems to be meeting the course outcomes exceptionally well.

Outcome 1. Solve equations and inequalities: 87% of our students received a score of 2 or 3.

Outcome 2. Graph Equations and Inequalities: 93% of our students received a score of 2 or 3.

Outcome 3. Perform Functional Operations: 83% of our students received a score of 2 or 3.

Outcome 4. Translate and solve applications: 94% of our students received a score of 2 or 3.

2. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

I will be communicating the results of the assessment to mathematics faculty emphasizing the areas that need improvement. The exam questions seemed quite effective in measuring student achievement for this outcome. There will be some minor adjustments made to the final exam.

3. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
No changes intended.			

4. Is there anything that you would like to mention that was not already captured?

5.

III. Attached Files

Final Exam Item Analysis

Faculty/Preparer:	Michael Quail	**Date:**	07/10/2016
Department Chair:	Lisa Rombes	**Date:**	07/26/2016
Dean:	Kristin Good	**Date:**	07/27/2016
Assessment Committee Chair:	Michelle Garey	**Date:**	10/03/2016

COURSE ASSESSMENT REPORT

I. Background Information

1. Course assessed:
   Course Discipline Code and Number: MTH 176
   Course Title: College Algebra
   Division/Department Codes: MTHD

2. Semester assessment was conducted (check one):
   X☐ Fall 2010__
   ☐ Winter 20__
   ☐ Spring/Summer 20__

3. Assessment tool(s) used: check all that apply.
   ☐ Portfolio
   ☐ Standardized test
   ☐ Other external certification/licensure exam (specify):
   ☐ Survey
   ☐ Prompt
   X☐ Departmental exam
   ☐ Capstone experience (specify):
   ☐ Other (specify):

4. Have these tools been used before?
   ☐ Yes
   X☐ No

   If yes, have the tools been altered since its last administration? If so, briefly describe changes made.

5. Indicate the number of students assessed/total number of students enrolled in the course.
   There were approximately 200 students enrolled in the course and 30 tests were randomly selected.

6. Describe how students were selected for the assessment.
   Each test was numbered within the batch from each section. A random number generator was used to produce random numbers – as these numbers came up, the tests with these numbers were selected. This process was repeated 6 times – 5 tests were gathered from each of the 6 sections.

II. Results

1. Briefly describe the changes that were implemented in the course as a result of the previous assessment.
   In 2009, a department-wide curriculum project produced changes to the curriculum in the algebra sequence (067, 097, 169, 176 and 180). MTH 176 was affected by streamlining the content to better flow from MTH 169 and forward to MTH 180.

2. List each outcome that was assessed for this report exactly as it is stated on the course master syllabus.
   1. Solve equation and inequalities.
   4. Translate and solve applications.

3. Briefly describe assessment results based on data collected during the course assessment, demonstrating the extent to which students are achieving each of the learning outcomes listed above. ***Please attach a summary of the data collected.***
   Outcome #1 was assessed by evaluating 4 different solving equations questions on the common final. The success percentages ranged from 43% to 73% of the students scoring 3 or better on each of the questions (see attached spreadsheet).

   Outcome #4 was assessed by evaluating 2 different application problems on the common final. The success percentages were 90% and 70%, respectively (see attached spreadsheet).

4. For each outcome assessed, indicate the standard of success used, and the percentage of students who achieved that level of success. ***Please attach the rubric/scoring guide used for the assessment.***
   We were hoping that at least 75% of the students would score a 3 or better (out of 4) using the departmental scoring rubric (see attached).

5. Describe the areas of strength and weakness in students' achievement of the learning outcomes shown in assessment results.
   Strengths: We were very close to hitting our goal with respect to solving polynomial and logarithmic equations and applications. We hit the mark with solving exponential application problems.

   Weaknesses: We definitely were unsuccessful in the arena of solving exponential equations (outside of an application) and solving systems of non-linear equations.

III. Changes influenced by assessment results

1. If weaknesses were found (see above) or students did not meet expectations, describe the action that will be taken to address these weaknesses.
   These assessment results will be shared with all instructors of MTH 176. Increased emphasis will be placed on these topics this semester. We will assess again at the end of the winter semester to see if students have done better with these outcomes.

2. Identify intended changes that will be instituted based on results of this assessment activity (check all that apply). Please describe changes and give rationale for change.
   a. ☐ Outcomes/Assessments on the Master Syllabus
      Change/rationale:

   b. ☐ Objectives/Evaluation on the Master Syllabus
      Change/rationale:

   c. ☐ Course pre-requisites on the Master Syllabus
      Change/rationale:

   d. ☐ 1st Day Handouts
      Change/rationale:

   e. X☐ Course assignments
      Change/rationale: Increased focus on solving exponential equations and non-linear systems of equations. In addition, applications of logarithm problems will be more emphasized.

   f. ☐ Course materials (check all that apply)
      ☐ Textbook
      ☐ Handouts
      ☐ Other:

   g. ☐ Instructional methods
      Change/rationale:

   h. ☐ Individual lessons & activities
      Change/rationale:

3. What is the timeline for implementing these actions?

This increased focus will happen immediately.

IV. Future plans

1. Describe the extent to which the assessment tools used were effective in measuring student achievement of learning outcomes for this course.
   The department felt the common exam questions effectively assessed the two course outcomes focused on in this report.

COURSE ASSESSMENT REPORT

2. If the assessment tools were not effective, describe the changes that will be made for future assessments.

3. Which outcomes from the master syllabus have been addressed in this report?
   All _____ Selected _1 and 4____
   If "All", provide the report date for the next full review: _____.
   If "Selected", provide the report date for remaining outcomes: _____Fall 2011_____.

Submitted by:

Print: Kristin Chatas **Signature** Kristin Chatas **Date:** 1.4.11
Faculty/Preparer

Print: Kristin Chatas **Signature** Kristin Chatas **Date:** 1/4/11
Department Chair

Print: Martha A. Showalter **Signature** M. Showalter **Date:** JAN - 6 2011
Dean/Administrator

Sr done logged 1/11/11 sf

WASHTENAW COMMUNITY COLLEGE

COURSE ASSESSMENT REPORT

RECEIVED
IN THE OFFICE OF THE DEAN
JAN 17 2007
MATH, NATURAL AND
BEHAVIORAL SCIENCES DIVISION

I. Background Information

1. Course assessed:
   Course Discipline Code and Number: MTH 176
   Course Title: College Algebra
   Division/Department Codes: 12200

2. Semester assessment was conducted (check one):
   - ☒ Fall 2006
   - ☐ Winter 20__
   - ☐ Spring/Summer 20__

3. Assessment tool(s) used: check all that apply.
   - ☐ Portfolio
   - ☐ Standardized test
   - ☐ Other external certification/licensure exam (specify):
   - ☐ Survey
   - ☐ Prompt
   - ☐ Departmental exam
   - ☐ Capstone experience (specify):
   - ☒ Other (specify): Eight problems given on exams

4. Have these tools been used before?
   - ☒ Yes
   - ☐ No

   If yes, have the tools been altered since its last administration? If so, briefly describe changes made.
   No

5. Indicate the number of students assessed/total number of students enrolled in the course.
   75/132

6. Describe how students were selected for the assessment.
   All of the students in 4 of the 5 sections were selected to be assessed.

II. Results

1. Briefly describe the changes that were implemented in the course as a result of the previous assessment.
   A new syllabus with new outcomes and objectives has been developed and will be submitted soon.

2. State each outcome (verbatim) from the master syllabus for the course that was assessed.
   Solve and graph rational and higher order equations.
   Graph conic sections.
   Solve, perform operations and represent problems with exponential and logarithmic functions.
   Solve problems involving series and binomial expansions.

3. Briefly describe assessment results based on data collected during the course assessment, demonstrating the extent to which students are achieving each of the learning outcomes listed above. ***Please attach a summary of the data collected.***
   Students were most successful working with problems involving exponential and logarithmic functions.
   They were least successful at graphing conic sections.

4. For each outcome assessed, indicate the standard of success used, and the percentage of students who achieved that level of success. ***Please attach the rubric/scoring guide used for the assessment.***
   On a 0-4 scale, a score of 3 or 4 was considered successful.
   For outcome #1, 65% of the students were successful.

For outcome #2, 54% of the students were successful.
For outcome #3, 75% of the students were successful.
For outcome #4, 67% of the students were successful

5. Describe the areas of strength and weakness in students' achievement of the learning outcomes shown in assessment results.

   Strengths: Students were able to perform operations and solve problems involving exponential and logarithmic functions.

   Weaknesses: Students had difficulty solving cubic equations, graphing rational functions and conic sections. They also had difficulty working with an arithmetic series and a binomial expansion.

III. Changes influenced by assessment results

1. If weaknesses were found (see above) or students did not meet expectations, describe the action that will be taken to address these weaknesses.
   The syllabus has been rewritten. Sequences, series and binomial expansions will no longer be part of the course. This will allow for more time to be spent teaching the remaining topics.

2. Identify intended changes that will be instituted based on results of this assessment activity (check all that apply). Please describe changes and give rationale for change.

   a. ☒ Outcomes/Assessments on the Master Syllabus
   Change/rationale: As mentioned above, topics will be deleted from the syllabus allowing more time to be spent on the remaining topics.

   b. ☒ Objectives/Evaluation on the Master Syllabus
   Change/rationale: Same as a.

   c. ☐ Course pre-requisites on the Master Syllabus
   Change/rationale:

   d. ☐ 1st Day Handouts
   Change/rationale:

   e. ☐ Course assignments
   Change/rationale:

   f. ☒ Course materials (check all that apply)
   - ☒ Textbook
   - ☐ Handouts
   - ☐ Other:

   g. ☐ Instructional methods
   Change/rationale:

   h. ☐ Individual lessons & activities
   Change/rationale:

3. What is the timeline for implementing these actions? Fully implemented by Fall 2007

IV. Future plans

1. Describe the extent to which the assessment tools used were effective in measuring student achievement of learning outcomes for this course.
   They were effective in determining some of the weaknesses of the current curriculum.
2. If the assessment tools were not effective, describe the changes that will be made for future assessments.

COURSE ASSESSMENT REPORT

3. Which outcomes from the master syllabus have been addressed in this report?
   All _X_ Selected _____
   If "All", provide the report date for the next full review: _____.
   If "Selected", provide the report date for remaining outcomes: _____.

Submitted by:

Name: Michael King/Michael King Date: 1/5/07
Print/Signature

Department Chair: _____ Date: _____
Print/Signature

Dean: Martha A. Showalter M. Showalter Date: JAN 17 2007
Print/Signature

WASHTENAW COMMUNITY COLLEGE

COURSE ASSESSMENT REPORT

Background Information

1. Course assessed:
   Course Discipline Code and Number: MTH 176
   Course Title: College Algebra
   Division/Department Codes:

2. Semester assessment was conducted (check one):
   - ☐ Fall 20__
   - ☒ Winter 20 06
   - ☐ Spring/Summer 20__

3. Assessment tool(s) used: check all that apply.
   - ☐ Portfolio
   - ☐ Standardized test
   - ☐ Other external certification/licensure exam (specify):
   - ☐ Survey
   - ☐ Prompt
   - ☐ Departmental exam
   - ☐ Capstone experience (specify):
   - ☒ Other (specify): Eight questions were given throughout the term on exams

4. Have these tools been used before?
   - ☐ Yes
   - ☒ No

   If yes, have the tools been altered since its last administration? If so, briefly describe changes made.

5. Indicate the number of students assessed/total number of students enrolled in the course.
   22/100

6. Describe how students were selected for the assessment.
   Directions were given to the three instructors of the five sections of MTH 176. One of the instructors was unclear about the directions. Results were turned in from three of the sections taught by two instructors. One of the instructors spread the questions out over the course of the term. The other instructor (who taught two sections) gave the eight questions as questions 33-40 on a 40 question final exam.

   Using a random number generator, one-third of the exams from each section were chosen.
   During the grading process, it became apparent that the students who were given the problems at the end of their final exam put very little effort into their work. To confirm this, I separated their answers from the other group and graded them individually. The 'final exam' group averaged 1.3 (on a scale of 0 to 4) for each answer. The other group averaged 2.9 for each answer. As a result, I chose to use the results of the section in which the students actually made an effort. I went back and graded all of their papers.

Results

1. Briefly describe the changes that were implemented in the course as a result of the previous assessment.

2. State each outcome from the master syllabus that was assessed.
   Solve and graph rational and higher order equations
   Solve, perform operations and represent problems with exponential and logarithmic functions
   Graph conic sections
   Solve problems involving series and binomial expansions

abbreviated wording in assessment correspond to master syllabi

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3. Briefly describe assessment results based on data collected during the course assessment, demonstrating the extent to which students are achieving each of the learning outcomes listed above. Please attach a summary of the data collected.
   Students were most successful at solving equations (questions #1 and #5). They seem to have the most difficulty graphing a conic section (#3) and using the appropriate formulas correctly to solve problems (#6 and #7). The data is attached.

4. For each outcome assessed, indicate the standard of success used, and the percentage of students who achieved that level of success.
   On a 0-4 scale, a score of 3 or 4 was considered successful.
   For outcome #1, 76% of the students were successful.
   For outcome #2, 73% of the students were successful.
   For outcome #3, 62% of the students were successful.
   For outcome #4, 73% of the students were successful.

5. Describe the areas of strength and weakness in students' achievement of the learning outcomes shown in assessment results.
   Strengths: Students were mo st successful at solving the equations presented (a cubic equation and a logarithmic equation).

   Weaknesses: Graphing conic sections (specifically an ellipse) was the one outcome in which 70% of the students were not successful at.

Changes influenced by assessment results

1. If weaknesses were found (see above) or students did not meet expectations, describe the action that will be taken to address these weaknesses, along with a timeline for these actions.
   At the start of the fall semester, instructors will be informed of the weakness identified and asked to place a greater emphasis on it.

2. Identify any other intended changes that will be instituted based on results of this assessment activity (check all that apply). Please describe changes and give rationale for change.
   ☐ Master syllabus
   Change/rationale:

   ☐ Curriculum
   Change/rationale:

   ☐ Course syllabus
   Change/rationale:

   ☐ Course assignments
   Change/rationale:

   ☐ Course materials (check all that apply)
   - ☐ Textbook
   - ☐ Handouts
   - ☐ Other:

   Change/rationale:

   ☒ Instructional methods

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Change/rationale: A greater emphasis will be placed on graphing conic sections to improve student performance.

☐ Other:
Change/rationale:

Future plans

1. Describe the extent to which the assessment tools used were effective in measuring student achievement of learning outcomes for this course.
   The biggest problem with this assessment was the lack of communication with the instructors. The assessment questions seemed appropriate.
2. If the assessment tools were not effective, describe the changes that will be made for future assessments.
   For future assessments, be sure instructors understand and agree on the format.

Submitted by:

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Department Chair: [signature] Date: 7/18/2006

Dean: M. Stowe Date: 8/2/06