

Course Outcomes Guide (COG)

Directions: Please complete this form to document your progress toward improving student learning. For each item, indicate your progress and your anticipated next steps. Thank you!

Course Title: MAT 098 Elementary Algebra

Date: June 2014

Course Team: Math Faculty

Expected Learning Outcomes

STUDENT LEARNING OUTCOMES:

Upon successful completion of this course students will be able to:

1. Use computational techniques and algebraic skills essential for success in an academic, personal, or workplace setting (Computational and Algebraic Skills).
2. Use visualization, spatial reasoning, as well as geometric properties and strategies to model and solve problems (Geometric Skills).
3. Collect, organize, and display data as well as use appropriate statistical methods to analyze data and make inferences and predictions (Statistical Skills).
4. Communicate and understand mathematical statements, ideas and results, both verbally and in writing, with the correct use of mathematical definitions, terminology and symbolism (Communication Skills).
5. Work collaboratively with peers and instructors to acquire mathematical understanding and to formulate and solve problems and present solutions (Collaborative Skills).

Assessment (How do or will students demonstrate achievement of each outcome? Please attach a copy of your assessment electronically.)

All MAT 098 Pre-Algebra students complete the same homework, quizzes, and tests. We use MyMathLab to run the course and all instructors are using the same assignments. All students take a five question pre-test and take the same five questions again as a post-test that is incorporated into the final exam. Additionally, all students will answer the same three critical thinking essay questions on the final exam. All MAT 098 students should have a chance to work collaboratively with peers to formulate, solve, and present problems with solutions to their class by completing the group project.

Validation (What methods have you used or will you use to validate your assessment?)

We are using a 2-point rubric to grade the five question pre/post-test and all other tests in the course, which gives a total of 10 points. There is another two point rubric for the three critical thinking essay questions. The collaboration group project has a 25 point grading rubric.

Results (What do your assessment data show? If you have not yet assessed student achievement of your learning outcomes, when is assessment planned?)

There was a total of 388 MAT 098 students in the Fall 2013 and Spring 2014 semesters, but there were 151 students who did not answer questions on BOTH assessments (pre- and post-tests). It appears that 70 students did not answer the pre-test and 146 students did not answer the post-test. There were 100 blanks on the post-test by students who walked away and earned an F for the course. There were 28 students who withdrew from the course.

Of the 137 students who took both assessments only 10 did not have an increase in learning. These students had a lower (or the same) post-test score. It appears that students are learning something by taking MAT 098. There were 9 students that had an increase of 7 or more points from the pre-test, which is quite impressive. The data tables are attached for the pre/post-test change in score.

Another thing that was looked at was post-test critical thinking essay score versus course grade. There were three critical thinking essay questions worth two points each for a total of 6 points. A table of this data is attached. Students were expected to communicate mathematical statements, ideas, and results in writing with the correct use of mathematical definitions, terminology, and symbolism.

There were no "A" students getting less than three total points and only six "F" students getting more than three total points on the critical thinking essay questions. The essay scores seem somewhat indicative of course grade. Further study and fine tuning will be needed in the future if we want to look at this type of comparison, but it is quite intriguing.

Looking at full-time vs adjunct course grade distribution and completer success, one will notice that the percentages are very similar. There does not appear to be a big difference between full-time and adjunct grading. That comparison is attached to the end of this document.

Follow-up (How have you used or how will you use the data to improve student learning?)

It appears that students should have an increase from the pre-test to the post-test by learning something in the course. Students have consistently averaged over a three point increase from pre-test to post-test score for six consecutive semesters. Please see the attached MAT 098 SLOA Report with these findings. The developmental mathematics team has deemed it unnecessary to give a pre-test and the focus should be on other aspects of the course like the final exam and other learning activities in the classroom.

We will be collecting more data in future semesters to better match our student learning outcomes which will be changing for the Fall 2014 semester. We plan to update the student learning outcomes to better match each individual developmental mathematics course. We will collect data from twelve common assessment questions from the final exam, including two critical thinking essay questions.

Moving forward we may want to continue looking at trends like critical thinking essay scores versus grade in the course. This may be a good indicator to tell us if our final exam is representative of what the students should learn by taking the course. We may find that we should make changes to the final exam if common assessment scores and course grades do not “match up”.

Budget Justification (What resources are necessary to improve student learning?)

No requests at this time.

Instructor: _____

Name: _____

Course Section: _____

Student ID: _____

Semester: _____

Pre/Post-Assessment for MAT 098 Pre-Algebra

Please answer the following questions. Do your work in the space provided and place your final answer in the answer column.

Answers:

1. \$ _____

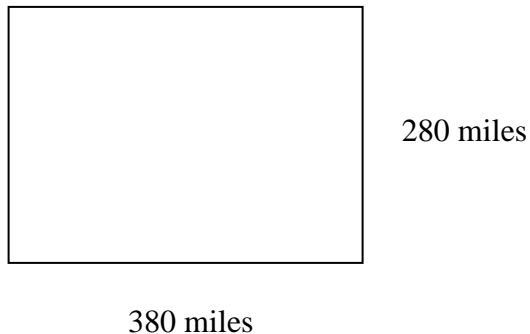
Find the average amount of unclaimed prizes in dollars and write your answer in standard notation.

State	Unclaimed Prizes (in millions of dollars)
New York	73.2
Texas	58.7
Florida	48.1
Ohio	33.5
California	29.6

Perimeter = _____

2. Area = _____

The state of Colorado is roughly the shape of a rectangle whose dimensions are 380 miles by 280 miles. Find the perimeter and area. Use correct units.



3. _____

Simplify. Write your answer as an integer.

$$3 \cdot 4 + 2^3 - (3^2 - 12 \div 2)$$

4. _____

Simplify. Write your answer as a simplified fraction (proper, improper, or mixed).

$$\frac{1}{3} - 4\frac{1}{2} \cdot \frac{6}{7} \div \frac{9}{7} + \frac{2}{5}$$

5. _____

A lawn requires 300 gallons of water for every 700 ft^2 .
What is the rate in gallons per square feet?
Round your answer to the nearest tenth. Use correct units.

Critical Thinking Essay Questions

48. Give an example of a situation in your life where you would need to set up and solve an equation. Describe the situation, then set up and solve the equation.

49. Explain in words how to add the fractions $\frac{2}{3}$ and $\frac{1}{4}$, show your work, and add the fractions.

50. A question on Quentin's assignment asks him find the simple interest and the total amount due if he borrows \$5,000 at 6% for four years. He completes his work as follows:

$$\text{Interest} = 5000 (0.6) (4) = 12000 \qquad \text{Total} = 5000 + 12000 = \$17,000$$

Find and explain Quentin's mistake, show your work, and find the correct total.

Grading Rubric for Developmental Mathematics

This general scale is to be used for all Tests and Final Exams in MAT 098, MAT 099, and MAT 100.

All questions are worth 2 points.

2 points	Answer is completely correct, including any necessary units.
1.75 points	Work correct but one minor error was made (unless the problem is testing one of these concepts – mostly in 098): <ul style="list-style-type: none">• missing a negative• missing units• simple arithmetic errors
1.5 points	Work is mostly correct (75% or greater) but there are two or more minor errors OR one major error.
1 point	Work is approximately 50% correct.
0.5 point	Work is approximately 25% correct AND some basic understanding of the concept is demonstrated.
0 points	Work is roughly less than 25% correct OR no basic understanding is demonstrated.

Rubric for grading Essay/Concept Questions

Students can earn up to 2 points for each essay/concept question on the final exam. Points are earned by meeting the following criteria:

- 1 point for accurate explanation of situation presented in problem
- 0.5 point for use of correct mathematical terminology and symbolism
- 0.5 point for use of complete sentences

Grading Rubric for the Collaboration Assignment

Area	Possible Points	Assigning Points	Description
Formulate problems	5 points	All students in the group should probably earn the same score for this area.	<p>Students should formulate their own application problems</p> <p>Examples: groups could create their own systems of equations application problem, groups could collect their own set of data for mean, median, mode, etc.</p>
Solve problems	5 points	All students in the group should probably earn the same score for this area.	Students should solve the problems they formulated.
Present solutions	10 points	Students should receive a score based on their own performance.	Each student must participate in the presentation of the group's work. Presentations do <i>not</i> need to be long, elaborative affairs.
Collaboration	5 points	Students should receive a score based on their own performance.	Assign points to each student based on their participation and collaboration efforts within their group.

Total: 25 points

Critical Thinking Essay Question Total vs Course Grade

13/FA Grade Distribution

Count of Register	Column Labels						Grand Total
Row Labels	A	B	C	F	F-WF	W	Grand Total
0		2		2			4
0.5			1	1			2
1				4			4
1.5		3	1	1			5
1.75			2	1			3
2		3	1	3			7
2.25				1			1
2.5		2	6	5			13
3	2	4	7	2			15
3.25			1				1
3.5	2	6	1				9
4	3	9	3				15
4.5	9	8	3		1		21
4.75		1					1
5	1	3	8				12
5.25			1				1
5.5	3	5					8
6	5	4	3				12
(blank)	1			15	36	15	67
Grand Total	26	50	38	35	37	15	201

Critical Thinking Essay Question Total vs Course Grade

14/SP Grade Distribution

Count of Register	Column Labels								Grand Total
Row Labels	A	B	C	F	F-WF	I	AU	W	Grand Total
0				6					6
0.5				1					1
1				1					1
1.5		5		2					7
2		1	7	2					10
2.5			2	2					4
3	2	2	1	1					6
3.5	3	2	5						10
4	3	5	3	4					15
4.5	1	2	3	2					8
5	3	5	3						11
5.5	7	1	1						9
6	15	3	3						21
(blank)					63	1	1	13	78
Grand Total	34	26	28	21	63	1	1	13	187

Pre/Post change in grade

13/FA Grade Distribution

Count of Register	Column Labels						Grand Total
Row Labels	A	B	C	F	F-WF	W	Grand Total
-2				1			1
-0.5		1	1				2
-0.25			1				1
0		1	2	1			4
0.25			1				1
0.5		1	2	3			6
1		2	3	1			6
1.5			2	2			4
1.75		1	1				2
2		5	2	1			8
2.5	1	3	3	3			10
2.75	2						2
3	2	6	3				11
3.25	1	1					2
3.5	2	5	5	2			14
3.75	2						2
4	1	4	2	1			8
4.25	1						1
4.5	3	4	2				9
4.75	1	2					3
5	1	3	1				5
5.25	2	1		1			4
5.5	1	4					5
5.75		2					2
6	1		1				2
6.25		3	1	1			5
6.75		1	1	1			3
7	1		1	1			3
7.25	1						1
7.5	1		1				2
8.5	1		1				2
(blank)	1		1	16	37	15	70
Grand Total	26	50	38	35	37	15	201

Pre/Post change in grade

14/SP Grade Distribution

Count of Register	Column Labels								Grand Total
Row Labels	A	B	C	F	F-WF	I	AU	W	Grand Total
-0.5		1							1
0			1						1
0.25		1							1
0.5		2							2
0.75			1						1
1		1	3	3					7
1.5	2	4	4	2					12
2	3	2	3	4					12
2.25	1	1	2						4
2.5	2	2		1					5
2.75	2		1						3
3	2	1	4	3					10
3.25		1							1
3.5	1	1	2	1					5
3.75		2		3					5
4	3	2	2	3					10
4.5	6	1	2						9
4.75	2								2
5				1					1
5.25	2								2
5.5	1	1							2
5.75	2	1							3
6	2	2							4
6.5	1		1						2
8.25	1								1
(blank)	1		2		63	1	1	13	81
Grand Total	34	26	28	21	63	1	1	13	187

MAT-098 SLOA Report

Lead Faculty: Rich Campbell

Term	Course Results					Common Assessments					
	# of Students	Success	Walk-Away F	Withdrawal	Mean GPA	PreTest Avg	PostTest Avg	Avg Change	Course	GenEd	Program
12/SP	n = 236	50.8% n=120	16.5% n=39	9.3% n=22	1.69	--- out of 10	--- out of 10	---	---	NA	NA
12/SU	n = 75	66.7% n=50	20.0% n=15	2.7% n=2	2.21	2.18 out of 10	5.75 out of 10	3.39	---	NA	NA
12/FA	n = 152	50.0% n=76	28.3% n=43	10.5% n=16	1.65	2.25 out of 10	5.94 out of 10	3.59	---	NA	NA
13/SP	n = 155	56.8% n=88	32.3% n=50	3.9% n=6	1.83	2.59 out of 10	6.34 out of 10	3.55	---	NA	NA
13/SU	n = 76	53.9% n=41	0.0% n=0	6.6% n=5	1.79	2.68 out of 10	5.88 out of 10	3.22	---	NA	NA
13/FA	n = 200	57.0% n=114	18.5% n=37	7.0% n=14	1.77	2.16 out of 10	5.91 out of 10	3.49	3.63 out of 6	NA	NA
14/SP	n = 161	45.3% n=73	35.4% n=57	6.2% n=10	1.48	2.42 out of 10	5.78 out of 10	3.17	3.86 out of 6	NA	NA
14/SU	n = 71	0.0% n=0	0.0% n=0	0.0% n=0	0.00	---	---	---	---	NA	NA

MAT-098 AY 2013-2014

	Total	A	B	C	D	F	WF	W/I/AU	Success	Completer Success
2013-2014 Summary	463	16.2% (n=75)	19.7% (n=91)	16.6% (n=77)	0.0% (n=0)	40.2% (n=186)	21.6% (n=100)	7.3% (n=34)	52.5% (n=243)	73.9%

Full-Time Faculty vs Adjunct Faculty

	Total	A	B	C	D	F	WF	W/I/AU	Success	Completer Success
Full-time	91	17.6% (n=16)	16.5% (n=15)	15.4% (n=14)	0.0% (n=0)	41.8% (n=38)	25.3% (n=23)	8.8% (n=8)	49.5% (n=45)	75.0%
Adjunct	372	15.9% (n=59)	20.4% (n=76)	16.9% (n=63)	0.0% (n=0)	39.8% (n=148)	20.7% (n=77)	7.0% (n=26)	53.2% (n=198)	73.6%