

Course Outcomes Guide (COG)

Course Title: MAT 100 Intermediate Algebra

Date: August 2016

Course Team: Rebecca Kendrick, Lead Instructor for MAT 100,
and other DEALS Math Faculty

Expected Learning Outcomes

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

1. Perform basic operations (add, subtract, multiply, divide, or simplify) on rational, radical, and complex expressions as well as functions.
2. Classify equations as linear, rational, radical, or exponential and identify techniques to solve each type of equation.
3. Solve quadratic, rational, radical, and exponential equations.
4. Graph quadratic, radical, and exponential functions.
5. Determine whether a relation is a function and find the domain of polynomial, rational, and radical functions.
6. Translate and model application problems involving quadratic, rational, radical, and exponential equations.
7. Use formulas.
8. Communicate and understand mathematical statements, ideas, and results, with the correct use of mathematical definitions, terminology, and symbolism.

Assessment: All MAT-100 Intermediate Algebra students complete the same homework, quizzes, and tests. We use MyMathLab to run the course and all instructors are using the same assignments. Additionally, all students take a common final exam.

The final exam is the outcomes assessment tool, with every question on the exam delegated to a specific course outcome.

1. Outcome #1 – questions 1-14 on final exam, worth 26 points
2. Outcome #2 – questions 15-16 on final exam, worth 5 points in 15/SP and 4 points in 14/FA (adjusted to simplify grading of multiple parts)
3. Outcome #3 – questions 17-24 on final exam, worth 16 points
4. Outcome #4 – questions 25-27 on final exam, worth 6 points
5. Outcome #5 – questions 28-32 on final exam, worth 11 points
6. Outcome #6 – questions 33-36 on final exam, worth 8 points
7. Outcome #7 – questions 37-38 on final exam, worth 6 points
8. Outcome #8 – questions 39-40 on final exam, worth 6 points

Validation: Every instructor receives a rubric for grading the final exam and all other tests in the course to ensure consistency in grading from section to section and instructor to instructor. We then compare results from semester to semester and year to year. For FY16, we did not have any external validation for our assessment.

Results: Analysis of student learning outcomes results reveal the following:

1. Outcome #'s 1 and 2 have the highest individual success rates (for the year) at 74.5% and 78.8% respectively. Performance on both outcomes 1 and 2 improved over AY15 results (from 70.2% and 73.3% respectively).
2. Outcome #'s 3, 6, and 8 have the lowest individual success rates at 55.1%, 58.7%, and 48.6% respectively. However, all three outcomes improved over AY15 results (from 44.5%, 42.1% and 23.6% respectively).

Follow-up:

1. MAT 100 is changing to a 4-credit course in 16/FA.
2. Adjustments to curriculum for the 2016-2017 academic year include:
 - a. Bringing lines, systems of equations, and factoring (modules 12, 13, and 15) into MAT 100 from 099.
 - b. Removing exponential equations (module 20). Students will learn this in MAT 101 should they choose that as their general education math course.
 - c. Rearranging content:
 - i. modules 15 and 19 will now be taught together – this will provide students who struggle to solve equations by factoring (module 15) with an alternate method, the quadratic formula (module 19)

- ii. modules 16 and 18 will now be taught together – rational expressions (module 16) is a traditionally difficult topic for students. Pairing it with radical expressions/equations (module 18), which is traditionally a bit easier for students, will provide a nice balance on test 3.
- d. Added two chapters of statistics – about 50% of the students who complete MAT 100 end up taking MAT 109, Statistics, for their gen ed math class. Previously, all MAT 100 material was geared towards students who would proceed to MAT 101, 103, or 114 (College Algebra, Finite Mathematics, or Applied Algebra).
- e. Outcomes for 16/FA have changed to reflect the new curriculum.

3. **Success Rates (students who earned an A, B, or C).**

13/FA	72.3%
14/FA	59.3%
15/FA	59.6%

14/SP	58.3%
15/SP	46.3%
16/SP	53.8%

Fall success rate held steady, while the spring success rate increased dramatically from 15/SP to 16/SP (the first and second spring semester in the new textbook).

Budget Justification: No additional funding/resources is necessary at this time.

Attachments:

1. SLO Assessment
2. SLO Rubric
3. Grade Distribution Summary
4. SLOA at a Glance
5. AY 2015-2016 Assessment Results by Outcome

SLO Assessment for MAT 100 Intermediate Algebra

The SLO assessment is the Final Exam and is currently in use. For test security purposes, the exam is not attached to this Course Outcome Guide. A copy of the assessment is stored at the division level and is available to any faculty, staff, administrator, or accrediting body as requested.

Grading Rubric for Developmental Mathematics

Use this general scale for grading all tests and the Final Exam in MAT 098/099/100.

Percentage of Point Value	Description	
	<i>Computational Questions</i>	<i>Essay Questions</i>
100%	The student has the problem worked out completely, showing all the proper steps, and has the correct answer.	Answer must meet the criterion listed to the left AND must also be in complete sentences and use correct mathematical terminology and symbolism
90%	The student has worked out the problem using the correct mathematical procedure, but has made one minor mathematical (arithmetical) mistake giving the incorrect answer (unless the problem is testing one of these concepts, as oft is the case in MAT 098).	The criterion to the left is to be used.
75%	The student has used the correct mathematical procedure, but has several minor arithmetical errors or has one more major mathematical error in the problem.	The theme of the answer is correct, but has a minor error in mathematical terminology or symbolism OR the answer is not grammatically correct.
50%	The student has started the problem using the correct mathematical procedure, but has several mathematical errors and weak justification for the work.	The theme of the answer is correct but there is major mistake in mathematical terminology or symbolism.
25%	The student response demonstrates understanding of at least one major concept; however, it is mostly incorrect. Justifications may be missing or may lack clear mathematical reasoning. Only the correct answer is given without any supporting work.	The criterion to the left is to be used.
0	The student response is incorrect and lacks reasonable justification. The student did not respond to this problem.	The criterion to the left is to be used.

MAT-100 AY 2015-2016

	Total	A	B	C	D	F	WF	W/I/AU	Success	Completer Success
2015-2016 Summary	818	15.3% (n=125)	17.1% (n=140)	25.3% (n=207)	5.1% (n=42)	30.8% (n=252)	15.0% (n=123)	6.4% (n=52)	57.7% (n=472)	73.4%

Full-Time Faculty vs Adjunct Faculty

	Total	A	B	C	D	F	WF	W/I/AU	Success	Completer Success
Full-time	508	15.7% (n=80)	17.1% (n=87)	24.4% (n=124)	7.1% (n=36)	29.5% (n=150)	13.8% (n=70)	6.1% (n=31)	57.3% (n=291)	71.5%
Adjunct	310	14.5% (n=45)	17.1% (n=53)	26.8% (n=83)	1.9% (n=6)	32.9% (n=102)	17.1% (n=53)	6.8% (n=21)	58.4% (n=181)	76.7%

*Completer success is defined as the success rate of students who completed the course. It is calculated by the formula $(A + B + C) \div (\text{Total} - \text{WF} - \text{W} - \text{I} - \text{AU})$.

		MAT-100		15/SU							Completer Success	
	Total	A	B	C	D	F	WF	W/I/AU	Success	Success		
Lecture 12	23	21.7% (n=5)	8.7% (n=2)	13.0% (n=3)	4.3% (n=1)	47.8% (n=11)	26.1% (n=6)	4.3% (n=1)	43.5% (n=10)	62.5%		
Lecture Subtotal	23	21.7% (n=5)	8.7% (n=2)	13.0% (n=3)	4.3% (n=1)	47.8% (n=11)	26.1% (n=6)	4.3% (n=1)	43.5% (n=10)	62.5%		
Package Hybrid	9	33.3% (n=3)	22.2% (n=2)	11.1% (n=1)	0.0% (n=0)	22.2% (n=2)	11.1% (n=1)	11.1% (n=1)	66.7% (n=6)	85.7%		
Package Lecture	21	28.6% (n=6)	19.0% (n=4)	19.0% (n=4)	0.0% (n=0)	33.3% (n=7)	14.3% (n=3)	0.0% (n=0)	66.7% (n=14)	77.8%		
Package Web	21	42.9% (n=9)	14.3% (n=3)	23.8% (n=5)	0.0% (n=0)	14.3% (n=3)	4.8% (n=1)	4.8% (n=1)	81.0% (n=17)	89.5%		
Package Subtotal	51	35.3% (n=18)	17.6% (n=9)	19.6% (n=10)	0.0% (n=0)	23.5% (n=12)	9.8% (n=5)	3.9% (n=2)	72.5% (n=37)	84.1%		
Web 12	22	22.7% (n=5)	4.5% (n=1)	31.8% (n=7)	0.0% (n=0)	31.8% (n=7)	27.3% (n=6)	9.1% (n=2)	59.1% (n=13)	92.9%		
Web Subtotal	22	22.7% (n=5)	4.5% (n=1)	31.8% (n=7)	0.0% (n=0)	31.8% (n=7)	27.3% (n=6)	9.1% (n=2)	59.1% (n=13)	92.9%		
15/SU Subtotal	96	29.2% (n=28)	12.5% (n=12)	20.8% (n=20)	1.0% (n=1)	31.3% (n=30)	17.7% (n=17)	5.2% (n=5)	62.5% (n=60)	81.1%		

Full-Time Faculty vs Adjunct Faculty

	Total	A	B	C	D	F	WF	W/I/AU	Success	Completer Success
Full-time	45	22.2% (n=10)	6.7% (n=3)	22.2% (n=10)	2.2% (n=1)	40.0% (n=18)	26.7% (n=12)	6.7% (n=3)	51.1% (n=23)	76.7%
Adjunct	51	35.3% (n=18)	17.6% (n=9)	19.6% (n=10)	0.0% (n=0)	23.5% (n=12)	9.8% (n=5)	3.9% (n=2)	72.5% (n=37)	84.1%

*Completer success is defined as the success rate of students who completed the course. It is calculated by the formula (A + B + C) divided by (Total - WF - W - I - AU).

		MAT-100		15/FA						Completer
	Total	A	B	C	D	F	WF	W/I/AU	Success	Success
Hybrid First 7.5	27	14.8% (n=4)	40.7% (n=11)	22.2% (n=6)	0.0% (n=0)	22.2% (n=6)	14.8% (n=4)	0.0% (n=0)	77.8% (n=21)	91.3%
Hybrid Subtotal	27	14.8% (n=4)	40.7% (n=11)	22.2% (n=6)	0.0% (n=0)	22.2% (n=6)	14.8% (n=4)	0.0% (n=0)	77.8% (n=21)	91.3%
Lecture 12	37	18.9% (n=7)	13.5% (n=5)	21.6% (n=8)	5.4% (n=2)	35.1% (n=13)	24.3% (n=9)	5.4% (n=2)	54.1% (n=20)	76.9%
Lecture 15 week	154	13.6% (n=21)	17.5% (n=27)	26.0% (n=40)	5.8% (n=9)	29.9% (n=46)	12.3% (n=19)	7.1% (n=11)	57.1% (n=88)	71.0%
Lecture Subtotal	191	14.7% (n=28)	16.8% (n=32)	25.1% (n=48)	5.8% (n=11)	30.9% (n=59)	14.7% (n=28)	6.8% (n=13)	56.5% (n=108)	72.0%
Package Hybrid	37	10.8% (n=4)	13.5% (n=5)	37.8% (n=14)	8.1% (n=3)	27.0% (n=10)	18.9% (n=7)	2.7% (n=1)	62.2% (n=23)	79.3%
Package Lecture	115	13.0% (n=15)	24.3% (n=28)	25.2% (n=29)	3.5% (n=4)	28.7% (n=33)	12.2% (n=14)	5.2% (n=6)	62.6% (n=72)	75.8%
Package Web	14	28.6% (n=4)	7.1% (n=1)	21.4% (n=3)	0.0% (n=0)	35.7% (n=5)	21.4% (n=3)	7.1% (n=1)	57.1% (n=8)	80.0%
Package Subtotal	166	13.9% (n=23)	20.5% (n=34)	27.7% (n=46)	4.2% (n=7)	28.9% (n=48)	14.5% (n=24)	4.8% (n=8)	62.0% (n=103)	76.9%
Web 15 week	24	16.7% (n=4)	16.7% (n=4)	12.5% (n=3)	0.0% (n=0)	29.2% (n=7)	12.5% (n=3)	25.0% (n=6)	45.8% (n=11)	73.3%
Web Subtotal	24	16.7% (n=4)	16.7% (n=4)	12.5% (n=3)	0.0% (n=0)	29.2% (n=7)	12.5% (n=3)	25.0% (n=6)	45.8% (n=11)	73.3%
15/FA Subtotal	408	14.5% (n=59)	19.9% (n=81)	25.2% (n=103)	4.4% (n=18)	29.4% (n=120)	14.5% (n=59)	6.6% (n=27)	59.6% (n=243)	75.5%

Full-Time Faculty vs Adjunct Faculty

	Total	A	B	C	D	F	WF	W/I/AU	Success	Completer Success
Full-time	255	17.3% (n=44)	22.4% (n=57)	23.9% (n=61)	5.5% (n=14)	25.5% (n=65)	11.0% (n=28)	5.5% (n=14)	63.5% (n=162)	76.1%
Adjunct	153	9.8% (n=15)	15.7% (n=24)	27.5% (n=42)	2.6% (n=4)	35.9% (n=55)	20.3% (n=31)	8.5% (n=13)	52.9% (n=81)	74.3%

*Completer success is defined as the success rate of students who completed the course. It is calculated by the formula (A + B + C) divided by (Total - WF - W - I - AU).

		MAT-100		16/SP						Completer
	Total	A	B	C	D	F	WF	W/I/AU	Success	Success
Hybrid First 7.5	18	33.3% (n=6)	16.7% (n=3)	16.7% (n=3)	11.1% (n=2)	22.2% (n=4)	5.6% (n=1)	0.0% (n=0)	66.7% (n=12)	70.6%
Hybrid Subtotal	18	33.3% (n=6)	16.7% (n=3)	16.7% (n=3)	11.1% (n=2)	22.2% (n=4)	5.6% (n=1)	0.0% (n=0)	66.7% (n=12)	70.6%
Lecture 12	17	5.9% (n=1)	11.8% (n=2)	29.4% (n=5)	0.0% (n=0)	41.2% (n=7)	29.4% (n=5)	11.8% (n=2)	47.1% (n=8)	80.0%
Lecture 15 week	173	9.8% (n=17)	12.7% (n=22)	25.4% (n=44)	8.1% (n=14)	35.8% (n=62)	16.8% (n=29)	8.1% (n=14)	48.0% (n=83)	63.8%
Lecture Subtotal	190	9.5% (n=18)	12.6% (n=24)	25.8% (n=49)	7.4% (n=14)	36.3% (n=69)	17.9% (n=34)	8.4% (n=16)	47.9% (n=91)	65.0%
Package Lecture	68	10.3% (n=7)	19.1% (n=13)	27.9% (n=19)	7.4% (n=5)	32.4% (n=22)	11.8% (n=8)	2.9% (n=2)	57.4% (n=39)	67.2%
Package Web	13	23.1% (n=3)	23.1% (n=3)	23.1% (n=3)	0.0% (n=0)	23.1% (n=3)	15.4% (n=2)	7.7% (n=1)	69.2% (n=9)	90.0%
Package Subtotal	81	12.3% (n=10)	19.8% (n=16)	27.2% (n=22)	6.2% (n=5)	30.9% (n=25)	12.3% (n=10)	3.7% (n=3)	59.3% (n=48)	70.6%
Web 15 week	25	16.0% (n=4)	16.0% (n=4)	40.0% (n=10)	8.0% (n=2)	16.0% (n=4)	8.0% (n=2)	4.0% (n=1)	72.0% (n=18)	81.8%
Web Subtotal	25	16.0% (n=4)	16.0% (n=4)	40.0% (n=10)	8.0% (n=2)	16.0% (n=4)	8.0% (n=2)	4.0% (n=1)	72.0% (n=18)	81.8%
16/SP Subtotal	314	12.1% (n=38)	15.0% (n=47)	26.8% (n=84)	7.3% (n=23)	32.5% (n=102)	15.0% (n=47)	6.4% (n=20)	53.8% (n=169)	68.4%

Full-Time Faculty vs Adjunct Faculty

	Total	A	B	C	D	F	WF	W/I/AU	Success	Completer
										Success
Full-time	208	12.5% (n=26)	13.0% (n=27)	25.5% (n=53)	10.1% (n=21)	32.2% (n=67)	14.4% (n=30)	6.7% (n=14)	51.0% (n=106)	64.6%
Adjunct	106	11.3% (n=12)	18.9% (n=20)	29.2% (n=31)	1.9% (n=2)	33.0% (n=35)	16.0% (n=17)	5.7% (n=6)	59.4% (n=63)	75.9%

*Completer success is defined as the success rate of students who completed the course. It is calculated by the formula (A + B + C) divided by (Total - WF - W - I - AU).

MAT-100 SLOA Report

Lead Faculty: Rebecca Kendrick

Term	Course Results					Common Assessments				
	# of Students	Success	Walk-Away F	With-drawal	Mean GPA	PreTest Avg	PostTest Avg	Avg Change	Course	GenEd
12/SP	n = 435	65.7% n = 286	11.7% n = 51	5.7% n = 25	2.10	N/A out of 10	N/A out of 10	N/A	----	N/A
12/SU	n = 119	70.6% n = 84	10.1% n = 12	8.4% n = 10	2.48	1.80 out of 10	7.94 out of 10	6.13	----	N/A
12/FA	n = 535	70.7% n = 378	15.7% n = 84	3.2% n = 17	2.11	1.28 out of 10	6.75 out of 10	5.28	----	N/A
13/SP	n = 483	63.6% n = 307	17.4% n = 84	4.6% n = 22	1.91	1.25 out of 10	6.96 out of 10	5.75	----	N/A
13/SU	n = 120	60.0% n = 72	0.0% n = 0	1.7% n = 2	1.84	1.15 out of 10	6.52 out of 10	5.42	----	N/A
13/FA	n = 566	72.3% n = 409	6.7% n = 38	4.1% n = 23	2.13	1.19 out of 10	7.25 out of 10	6.03	3.01 out of 6	N/A
14/SP	n = 343	58.3% n = 200	15.7% n = 54	6.4% n = 22	1.77	1.11 out of 10	6.90 out of 10	5.76	2.83 out of 6	N/A
14/SU	n = 113	71.7% n = 81	13.3% n = 15	6.2% n = 7	2.30	1.19 out of 10	7.47 out of 10	6.22	3.15 out of 6	N/A
14/FA	n = 418	59.3% n = 248	14.8% n = 62	7.2% n = 30	1.87	N/A	N/A	N/A	57.34 out of 83	N/A
15/SP	n = 312	46.8% n = 146	23.4% n = 73	9.3% n = 29	1.47	N/A	N/A	N/A	56.38 out of 84	N/A
15/SU	n = 96	63.5% n = 61	14.6% n = 14	5.2% n = 5	2.10	N/A	N/A	N/A	61.01 out of 84	N/A

MAT-100 SLOA Report

Lead Faculty: Rebecca Kendrick

Term	Course Results					Common Assessments				
	# of Students	Success	Walk-Away F	With-drawal	Mean GPA	PreTest Avg	PostTest Avg	Avg Change	Course	GenEd
15/FA	n = 408	59.6% n = 243	13.7% n = 56	6.4% n = 26	1.84	N/A	N/A	N/A	56.09 out of 84	N/A
16/SP	n = 314	53.8% n = 169	14.6% n = 46	5.4% n = 17	1.63	N/A	N/A	N/A	53.74 out of 84	N/A
16/SU	n = 102	47.1% n = 48	0.0% n = 0	8.8% n = 9	1.69	N/A	N/A	N/A	----	N/A
16/FA	n = 325	0.0% n = 0	0.0% n = 0	0.0% n = 0	0.00	N/A	N/A	N/A	----	N/A

Current Academic Year

MAT-100P SLOA Assessment for 15/FA

	Registered	Completed	SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7	SLO8	Total
15/FA Average	408	320	19.75	3.98	9.09	4.04	7.36	4.82	4.13	2.93	56.09
			<i>of 26</i>	<i>of 5</i>	<i>of 16</i>	<i>of 6</i>	<i>of 11</i>	<i>of 8</i>	<i>of 6</i>	<i>of 6</i>	<i>of 84</i>
			76.0%	79.6%	56.8%	67.3%	66.9%	60.2%	68.9%	48.8%	66.8%

MAT-100 SLOA Assessment for 16/SP

	Registered	Completed	SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7	SLO8	Total
16/SP Average	314	230	18.84	3.89	8.45	3.90	7.20	4.53	4.03	2.90	53.74
			<i>of 26</i>	<i>of 5</i>	<i>of 16</i>	<i>of 6</i>	<i>of 11</i>	<i>of 8</i>	<i>of 6</i>	<i>of 6</i>	<i>of 84</i>
			72.5%	77.7%	52.8%	65.0%	65.4%	56.6%	67.2%	48.3%	64.0%