

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 101 College Algebra

Date: June 2014

Course Team: Paula Kessler, Lead Instructor for MAT 101, and other 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, special 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. Critically analyze and construct mathematical arguments. (Proof and Reasoning)
5. Use technology, where appropriate, to enhance and facilitate mathematical understanding, as well as an aid in solving problems and presenting solutions. (Technological Skills)
6. 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)
7. Work collaboratively with peers and instructors to acquire mathematical understanding and to formulate and solve problems and present solutions. (Collaborative Skills)

COURSE CONTENT OBJECTIVES:

Numbers listed in trailing parentheses reference Mathematics Program Outcomes/Student Learning Outcomes. Outcome # 7 promotes student success and empowers professional growth of HCC graduates; therefore it is incorporated and emphasized throughout this course.

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

1. evaluate and/or simplify arithmetic and algebraic expressions using the order of operations agreement. (1,6)
2. simplify algebraic expressions using the definitions and properties of exponents (1,6)
3. simplify algebraic expressions containing fractions and/or radicals using the (1,6) definitions and properties of fractions and radicals (1,6)
4. add, subtract, multiply polynomials (1,6)
5. factor polynomials of the form $ax^2 + bxy + cy^2$ and sum and difference of two cubes (1,6)
6. add, subtract, multiply, and divide complex numbers, to simplify powers of i and replace principal square roots of a negative number with an expression involving i (1,6)
7. solve first degree equations with one variable, solve a formula for a specified variable in terms of the others and to apply these skills to application problems (1,6)
8. solve quadratic equations and equations that relate to quadratic equations including equations that involve radicals (1,6)
9. solve inequalities with one variable including first degree and rational (1,6)
10. solve first degree absolute value equations and inequalities (1, 2, 6)
11. find a function value and perform operations with functions including compositions (1, 4, 6)
12. graph a linear relation; find the slope of a line including those that are parallel or perpendicular to a given line. (1, 2, 6)
13. write an equation of a line when given a point and enough information to know its slope (1, 2, 6)
14. recognize an equation as being an equation for a circle and then finding the center and the radius of that circle (1, 2, 6)
15. write an equation for a circle when given the center and enough information to find the radius (1, 2, 6)
16. recognize and sketch quadratic functions by finding the vertex, intercepts, and any other necessary information (1, 2, 6)
17. divide polynomials using long division and synthetic division and to apply synthetic division to find values of polynomial functions and to solve polynomial equations (1, 6)
18. solve systems of first degree equations involving two variables (1, 4, 6)
19. evaluate and solve exponential and logarithmic functions (1,6)
20. find the inverse of a function (1,6)
21. graph exponential and logarithmic functions (1,6)
22. solve problems involving variation (direct, inverse and joint) (1,6)
23. graph polynomial functions using transformations (1,5,6)
24. analyze the graph of a polynomial function (1.5,6)
25. find the asymptotes of a rational function (1,5,6)
26. find the real and complex zeros of a polynomial function (1,5,6)

Assessment

All MAT 101 College Algebra students are completing the same homework, quizzes, tests, and 5 question assessment. We are using MyMathLab to run the course and all instructors are using the same assignments. All College Algebra students are also taking our 8 question General Education Assessment.

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

We are using a rubric to grade the 5 question assessment, and then making comparisons to previous semesters. In the past we have used the CAAP test to compare our students to the national norm. The college has used MAPP as well to compare HCC students to the national norm. In both cases the HCC students have been above the national norm.

Spring 2013 we gave the CAAP test to 3 sections of College Algebra from 3 different instructors. In Spring 2013 the national average on CAAP was 56.1% and HCC was 57.2% for mathematics.

Results

Our SLOA data is showing improvement to student learning. Since the start of the College Algebra Redesign in Fall 2007 with our pilot section and full implementation in Spring 2008 we have increased the rigor of the course in Fall 2009 and Fall 2011.

We complete the 5 question assessment every semester in all classes. The questions changed in Fall 2009 to include more material true to the class.

Follow-up

We have made changes in Fall 2007, Fall 2009, Fall 2011, and Fall 2012 as a result of our SLOA data to help increase the rigor of the course.

Fall 2011 we changed books to help increase the rigor of the course, and then we have made changes over the summer of 2012 to improve the course and a result of the book change.

Fall 2014 we will be changing the book and making adjustments. We will also be changing the syllabus to reflect only the math outcomes we actually cover in college algebra, not the entire spectrum of outcomes for all math classes for a math major. In the past we listed all math outcomes for a math major and during a general education such as college algebra these are not all covered, but a math major will cover all of the outcomes by the time they have completed the core math classes.

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

Since Fall 2008 when the Math Learning Center was established the program has been able to run smoothly. The MLC is an essential part to the success of the program. This has resulted in the addition of a part time IA in the MLC in the evenings and weekends to help our full time day IA. We now are able to offer a professional in the MLC during all the hours it is opened not just during the day time hours.

In Spring 2013 HCC opened the Student Learning Center (SLC). The Math Learning Center, The Science Learning Center and Student Success Center have now been combined into one area which is now the SLC. During the spring 2013 semester we have worked on trying to make the SLC as affective as the MLC has been in the past. We still have many changes to make, but we are headed in the right direction. Some of our problems have been the size of the new facility makes it hard to keep math in one place so the IA's are running all over the room and in turn do not have as much time to spend with students. We have also struggled with the reporting process of the hours students complete in the SLC since it does count towards part of their grade for the course.

Suggestion is to make sure we have enough money in the budget to have Math IA coverage during all hours that the SLC is open. From the first semester reporting over 75% of the time spent in the SLC by students is geared towards math. We also need to make sure there is money in the budget for student workers in the SLC and also in the classroom when students are in a computer lab working on their assignments.

We also need to include CAAP testing fees into the budget to verify the HCC course compared to the National Norm.

**Course: MAT 101
Kessler**

SLOA Data

Faculty Team: P.

	SU 2009	FA 2009	SP 2010	SU 2010	FA 2010	SP 2011	SU 2011	FA 2011	SP 2012	SU 2012	FA 2012	SP 2013	SU 2013	FA 2013	SP 2014
# Active students	153	381	315	156	409	355	156	394	406		405	327	168	402	446
# Withdraw % Withdraw	5.9	10.2	11.1	5.1	10.3	7.9	7.7	11.9	7.4		42 10.3%	30 6.3%	24 14.3%	39 9.7%	33 7.4%
# Walk-Away Fs* % Walk-Away Fs*		10.2	9.5		9.8	12.4		19.3	17.5		14	16	0.6%	45 11.2%	43 9.6%
% Success (A,B,C)	79.7	64.8	64.4	80.6	66.2	65.6	74.7	55.6	55.2		60.8%	60.9%	48.8%	58.5%	61.9%
% General Education SLOA											66%	64%		67.6%	66.6%
Common SLOA Course Score		16.75 N=290	16.27 N=284		17.4 N=263	17.3 N=228		17.8 N=214	17.6 N=282		17.6 N=291	16.6 N=327		23.2** N=402	24.93 N=446
% Course Score		67%	65.1%		69.6%	69.2%		71.2%	70.4%		70.4%	66.4%		66.2%	71.2%
Mean course grade(GPA)	2.69	2.24	2.34	2.71	2.43	2.38	2.62	2.69	2.72		2.53	2.49	1.90	2.09	2.19

*% Walk-away Fs = Did not take the final exam and received a grade of F.

** Fall 2013 Common SLOA Score out of 35. (SU 09 – SU 13 score was out of 25)