

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: August 2012

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

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.

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.

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

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

We have made changes in Fall 2007, Fall 2009, and Fall 2011 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.

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