

## Algebra II

### Course Goals

The following list of course goals will be addressed in the course. These goals are directly related to the performance objectives (Addendum A). (\*designates a CRUCIAL goal)

1. apply algebra content
2. identify algebra content applications
- 3.\* demonstrate algebra content command
- 4.\* replay problem solving strategies
5. (4) use non-routine problem-solving strategies
6. investigate field properties application
7. unravel linear equation and graph relationship
8. (7) relate graph, tables and equations
9. prescribe linear equation solution method
10. predict graph results
- 11.\* (10) capture data and statistical relationships
12. (10) investigate regression lines
13. (10) inspect data and graph connections
14. differentiate linear equations and linear inequality graphs
15. develop linear equation systems
- 16.\* (15) compute linear equation systems solutions
17. (15) interpret linear equation solutions
18. (15) research linear programming techniques
19. (15) validate minimum and maximum values function
20. (15) perform linear programming case study
21. graph absolute value equations and inequalities
22. (21) interpret absolute value function
23. (21) relate absolute value inequalities and linear inequalities
24. explore linear equations and space
25. create logic matrices
26. perform matrix operations
27. exhibit matrices and equation connection
28. (27) simplify linear systems matrices
29. assess system of linear equation methods
30. investigate polynomial expression operations
31. (30) troubleshoot factoring methods
32. breakdown radical expressions
33. (32) explore irrational numbers
34. connect radical and exponential equations
35. (34) manipulate radical and exponential equations
36. (34) solve radical and exponential equations
37. explore complex number system
38. (37) operate complex numbers
- 39.\* compare linear, quadratic functions and graphs
40. inspect distance and midpoint formula
41. demonstrate quadratic solutions methods
42. (41) derive quadratic formula
43. (41) apply quadratic formula
44. (41) discriminate quadratic equation roots
45. manipulate quadratic equation forms
46. (45) examine quadratic equation forms and graphs
47. analyze quadratic equation and practical problem connection
48. (47) formulate equations parabolic shapes

49. critique quadratic and absolute value graphs and functions
50. relate circle equations and graphs
51. connect ellipse equations and graphs
52. analyze hyperbola equations and graphs
53. decode conic section equation and graph relationships
54. (53) sketch (use definitions) conic sections graphs
55. (53) assess parabola, circle, ellipse and hyperbola relationship
56. (53) decode algebraically and graphically conic system equations and inequalities
57. relate quadratic and higher order equation graphs
58. (57) solve nonquadratic equations
59. investigate polynomial function theory
60. (59) approximate polynomial function zeroes
61. exhibit polynomial function graphs
62. operate composite functions
63. illustrate inverse functions
64. graph rational functions and their asymptotes
65. perform radical expression operations
66. (65) operate rational expressions and equations
67. manipulate direct, inverse and joint variations
68. write exponential and logarithmic relationships
69. (68) compare graphically exponential and logarithmic functions
70. apply logarithmic properties
71. (70) inspect common anti- and natural logarithms
72. (68) transform logarithmic and exponential equations
73. (68) solve logarithmic equations
74. grasp linear, quadratic, absolute-value and exponential function recognition
75. present major project

## ADDENDUM A

### PERFORMANCE OBJECTIVES

1. The student will be allowed references. The student will apply algebra content. Performance will be satisfactory if 80% accuracy and the identification are applied to the content throughout the term.
2. The student will be allowed references. The student will identify algebra content applications. Performance will be satisfactory if 80% accuracy and the identification are applied to the content throughout the term.
3. The student will be a member of ALGEBRA2. The student will demonstrate algebra content command. Performance will be satisfactory if command is demonstrated on the final examination as well as throughout the term.
4. The student will be allowed references. The student will replay problem solving strategies. Performance will be satisfactory if strategies are replayed and the replay is performed when applicable to situations developed throughout the term. The following Content Goals are related to this PO: 4, 5.
6. The student will be a member of ALGEBRA 2. The student will investigate field properties application. Performance will be satisfactory if application is made to each new number system studied.
7. The student will be provided tools. The student will unravel linear equation and graph relationship. Performance will be satisfactory if relationships are unravel and the relationship is demonstrated at the time of study and applied throughout the term. The following Content Goals are related to this PO: 7, 8.
9. The student will be allowed references. The student will prescribe linear equation solution method. Performance will be satisfactory if the method is prescribed and the prescription results in a satisfactory solution.
10. The student will be allowed references. The student will predict graph results. Performance will be satisfactory if results are predicted and the predication can be justified with a statement or demonstration of the results. The following Content Goals are related to this PO: 10, 11, 12, and 13.
14. The student will not be allowed references. The student will differentiate linear equations and linear inequality graphs. Performance will be satisfactory if the differentiation is justified with a verbal explanation and the ability to contrast is demonstrated throughout the term.
15. The student will be allowed references. The student will develop linear equation systems. Performance will be satisfactory if systems developed can be computed, interpreted and applied to real world situations. The following Content Goals are related to this PO: 15, 16, 17, 18, 19, and 20.
21. The student will be provided tools. The student will graph absolute value equations and inequalities. Performance will be satisfactory if equations and inequalities are graphed and the graph fits the conditions of the equation, problem solving situations and directions as demonstrated in class activities and testing throughout the term. The following Content Goals are related to this PO: 21, 22, and 23.
24. The student will be a member of ALGEBRA 2. The student will explore linear equations and space. Performance will be satisfactory if 3-D graph is demonstrated on paper and on 3-D model.

25. The student will be a member of ALGEBRA 2. The student will create logic matrices. Performance will be satisfactory if matrices are created and the solutions can be justified.
26. The student will be allowed references. The student will perform matrix operations. Performance will be satisfactory if operations are performed correctly and the performance produces a satisfactory solution.
27. The student will be a member of ALGEBRA 2. The student will exhibit matrices and equation connection. Performance will be satisfactory if connection is exhibited and the student can write a matrix for an equation and solve the equation using matrix operations. The following Content Goals are related to this PO: 27, 28.
29. The student will be allowed references. The student will assess system of linear equation methods. Performance will be satisfactory if methods /are assessed and the assessment produces a result which satisfies the equation
30. The student will be a member of ALGEBRA 2. The student will investigate polynomial expression operations. Performance will be satisfactory if operations are investigated and can be applied to the correct situation. The following Content Goals are related to this PO: 30, 31.
32. The student will be allowed references. The student wills breakdown radical expressions. Performance will be satisfactory if expressions are broken down and the breakdown is consistent with the simplification of radical rules. The following Content Goals are related to this PO: 32, 33.
34. The student will not be allowed references. The student will connect radical and exponential equations. Performance will be satisfactory if equations are connected and the connection is written with the applications of the rules for the relationship of radicals and exponents. The following Content Goals are related to this PO: 34, 35, and 36.
37. The student will be a member of ALGEBRA 2. The student will explore complex number system. Performance will be satisfactory if system is explored and the exploration is connected to previous study of number systems. The following Content Goals are related to this PO: 37, 38.
39. The student will be a member of ALGEBRA 2. The student will compare linear, quadratic functions and graphs. Performance will be satisfactory if functions and graphs are compared and the comparison of the function and graph can be justified.
40. The student will be allowed references. The student will inspect distance and midpoint formula. Performance will be satisfactory if formula are inspected and the inspection is consistent with current text and connected to the Pythagorean Theorem. The formula will then be applied to the conic section study.
41. The student will be a member of ALGEBRA 2. The student will demonstrate quadratic solutions methods. Performance will be satisfactory if methods are demonstrated to produce a solution that satisfies the equation or situation. The following Content Goals are related to this PO: 41, 42, 43, and 44.
45. The student will be allowed references. The student will manipulate quadratic equation forms. Performance will be satisfactory if forms are manipulated and the manipulation produces satisfactory solutions to the equation or form needed to retrieve information. The following Content Goals are related to this PO: 45, 46.
47. The student will be allowed references. The student will analyze quadratic equation and practical problem connection. Performance will be satisfactory if connections are analyzed and the

analysis results in the ability to solve the practical problem. The following Content Goals are related to this PO: 47, 48.

49. The student will be allowed references. The student will critique quadratic and absolute value graphs and functions. Performance will be satisfactory if graphs and functions are critiqued and the critique results in an appropriate generalization of the relationship.
50. The student will be a member of ALGEBRA 2. The student will relate circle equations and graphs. Performance will be satisfactory if graphs are related to the equation in various forms and connected to the definition.
51. The student will be a member of ALGEBRA 2. The student will connect ellipse equations and graphs. Performance will be satisfactory if equations and graphs are connected to the definition and various forms of the equations.
52. The student will be allowed references. The student will analyze hyperbola equations and graphs. Performance will be satisfactory if equations and graphs are analyzed and the analysis is connected to the definition.
53. The student will be allowed references. The student will decode conic section equation and graph relationships. Performance will be satisfactory if relationships are decoded and the decode is related to the equations and the definition of each conic and the general form of the conic equation. The following Content Goals are related to this PO: 53, 54, 55, and 56.
57. The student will be a member of ALGEBRA 2. The student will relate quadratic and higher order equation graphs. Performance will be satisfactory if graphs are related to the equations and their solutions. The following Content Goals are related to this PO: 57, 58.
59. The student will be a member of ALGEBRA 2. The student will investigate polynomial function theory. Performance will be satisfactory if theory is investigated and applied to the operations with polynomial functions. The following Content Goals are related to this PO: 59, 60.
61. The student will be a member of ALGEBRA 2. The student will exhibit polynomial function graphs. Performance will be satisfactory if graphs are exhibited with a sketch of the graph and general relationships can be listed.
62. The student will be allowed references. The student will operate composite functions. Performance will be satisfactory if functions are operated and the operation is consistent with the solutions.
63. The student will be allowed references. The student will illustrate inverse functions. Performance will be satisfactory if functions are illustrated and the illustration is consistent with the inverse equation and the reflection in the line  $x=y$ .
64. The student will be allowed references. The student will graph rational functions and their asymptotes. Performance will be satisfactory if asymptotes are graphed and the graph sketched correctly.
65. The student will be allowed references. The student will perform radical expression operations. Performance will be satisfactory if operations are performed and the performance is consistent with known results. The following Content Goals are related to this PO: 65, 66.
67. The student will be allowed references. The student will manipulate direct, inverse and joint variations. Performance will be satisfactory if variations are manipulated and the manipulation is applied to real world situations.

68. The student will be allowed references. The student will write exponential and logarithmic relationships. Performance will be satisfactory if relationships are written and the writing is consistent with the definition of exponential and logarithmic. The following Content Goals are related to this PO: 68, 69, 72, and 73.
70. The student will be allowed references. The student will apply logarithmic properties. Performance will be satisfactory if properties are applied and the application is applied to real world situations. The following Content Goals are related to this PO: 70, 71.
74. The student will be allowed references. The student will grasp linear, quadratic, absolute-value and exponential function recognition. Performance will be satisfactory if recognition is grasped and the grasping is demonstrated on the final exam at an 85% rate.
75. The student will be allowed references. The student will present major project. Performance will be satisfactory if project is presented and the presentation is a visual and verbal presentation to the members of the class. The presentation will be scored on a criteria developed and presented at the time the project objectives are distributed.

***Developed/Revised: 05-07-2004***