

## WTCS Repository

10-804-118 Intermediate Algebra w Apps

# Course Outcome Summary

### Course Information

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|  | Description | This course offers algebra content with applications and an introduction to functions and complex numbers. Content builds upon the arithmetic of real numbers by using variable equations to solve problems. Topics include graphing and finding algebraic solutions for linear equations and inequalities, quadratic, exponential, polynomial, radical, and rational equations. |
|  | Total Credits | 4 |
|  | Prior Learning Assessment | PLA Test |

Pre/Corequisites

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| Prerequisite | Each Wisconsin Technical College determines the General Education course prerequisites used by their academic institution. If prerequisites for a course are determined to be appropriate, the final Course Outcome Summary must identify the prerequisites approved for use by the individual Technical College. |

### Course Competencies

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| 1. | Use linear equations to solve applied problems |
|  | Assessment Strategies |
|  | 1.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 1.1. | evaluate a given formula for specified values |
|  | 1.2. | solve a given formula for a specified variable |
|  | 1.3. | create a linear equation to model a given scenario |
|  | 1.4. | solve a linear equation that models an applied problem |
|  | 1.5. | interpret the solution of a linear equation in context |
| 2. | Solve linear inequalities |
|  | Assessment Strategies |
|  | 2.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 2.1. | solve simple linear inequalities |
|  | 2.2. | solve compound linear inequalities |
|  | 2.3. | solve absolute value equations |
|  | 2.4. | solve absolute value inequalities |
|  | 2.5. | represent a solution using set builder notation |
|  | 2.6. | represent a solution using interval notation |
|  | 2.7. | represent a solution using a graph |
| 3. | Analyze relationships on the Cartesian plane |
|  | Assessment Strategies |
|  | 3.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 3.1. | graph a line, given its slope and point on the line |
|  | 3.2. | graph linear equations |
|  | 3.3. | find the distance between two points |
|  | 3.4. | find the midpoint of two points |
|  | 3.5. | identify one-to-one functions |
|  | 3.6. | graph an inverse function |
|  | 3.7. | graph the square root function |
|  | 3.8. | graph the absolute value function |
|  | 3.9. | graph the reciprocal function |
| 4. | Analyze linear equations |
|  | Assessment Strategies |
|  | 4.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 4.1. | compare slopes to determine if two lines are parallel, perpendicular, or neither |
|  | 4.2. | find the equation of a line, given two points on the line |
|  | 4.3. | write the equation of a line in standard form |
|  | 4.4. | write the equation of a line in slope-intercept form |
|  | 4.5. | write the equation of a line in point-slope form |
|  | 4.6. | find the slope given two points or the equation of the line |
|  | 4.7. | identify x- and y- intercepts |
| 5. | Apply properties of functions |
|  | Assessment Strategies |
|  | 5.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 5.1. | distinguish the differences between relations and functions |
|  | 5.2. | find the domain and range of a relation |
|  | 5.3. | use function notation |
|  | 5.4. | solve applications involving functions |
|  | 5.5. | perform arithmetic operations with functions |
|  | 5.6. | identify the domain of a function algebraically |
|  | 5.7. | write a composite function |
|  | 5.8. | evaluate a composite function for a specified value |
|  | 5.9. | determine the inverse of a function algebraically |
| 6. | Solve systems of equations |
|  | Assessment Strategies |
|  | 6.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 6.1. | create a system of linear equations to model a given scenario |
|  | 6.2. | solve a system of linear equations that models an applied problem |
|  | 6.3. | interpret a solution of a system of linear equations in context |
|  | 6.4. | solve a system of two linear equations by graphing |
|  | 6.5. | solve a system of two linear equations by the elimination method |
|  | 6.6. | solve a system of two linear equations by the substitution method |
|  | 6.7. | identify inconsistent or dependent systems |
| 7. | Solve polynomial equations |
|  | Assessment Strategies |
|  | 7.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 7.1. | factor using the greatest common factor |
|  | 7.2. | factor binomials |
|  | 7.3. | factor by grouping |
|  | 7.4. | factor trinomials |
|  | 7.5. | perform arithmetic operations with polynomials |
|  | 7.6. | factor the difference of two squares |
|  | 7.7. | factor the sum or difference of two cubes |
|  | 7.8. | use the zero product property of real numbers to solve polynomial equations |
|  | 7.9. | evaluate a polynomial function for a specified value |
| 8. | Use quadratic equations to solve applied problems |
|  | Assessment Strategies |
|  | 8.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 8.1. | apply the square root principle |
|  | 8.2. | apply the quadratic formula |
|  | 8.3. | graph a quadratic function written in standard form or vertex form |
|  | 8.4. | perform transformations on a quadratic function |
|  | 8.5. | identify the domain and range of a quadratic function |
|  | 8.6. | interpret the solution of a quadratic equation in context |
|  | 8.7. | use the Pythagorean Theorem to solve an applied problem |
|  | 8.8. | use a quadratic equation to solve an applied problem |
| 9. | Use rational equations to solve applied problems |
|  | Assessment Strategies |
|  | 9.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 9.1. | simplify rational expressions |
|  | 9.2. | find the domain of rational functions |
|  | 9.3. | perform arithmetic operations with rational expressions |
|  | 9.4. | simplify complex fractions |
|  | 9.5. | use a rational equation to solve an applied problem |
|  | 9.6. | interpret the solution of a rational equation in context |
|  | 9.7. | identify extraneous solutions |
|  | 9.8. | solve rational equations |
| 10. | Solve radical equations |
|  | Assessment Strategies |
|  | 10.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 10.1. | convert between radical and exponential notation |
|  | 10.2. | simplify radicals |
|  | 10.3. | apply rules of exponents with positive and negative rational exponents |
|  | 10.4. | perform arithmetic operations with radical expressions |
|  | 10.5. | evaluate a radical function for a specified value |
|  | 10.6. | find the domain of a radical function |
|  | 10.7. | solve equations containing radical expressions or rational exponents |
| 11. | Operate within the complex number system |
|  | Assessment Strategies |
|  | 11.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 11.1. | simplify radicals that include complex numbers |
|  | 11.2. | perform arithmetic operations with complex numbers |
|  | 11.3. | solve equations with complex solutions |
|  | 11.4. | determine a complex conjugate |
| 12. | Use exponential equations to solve applied problems |
|  | Assessment Strategies |
|  | 12.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria |
|  | 12.1. | identify an exponential function or relation |
|  | 12.2. | graph an exponential function |
|  | 12.3. | evaluate an exponential function for specified values |
|  | 12.4. | create an exponential function to model a given scenario |
|  | 12.5. | interpret the solution of an exponential equation in context |
|  | 12.6. | apply the definition of a logarithm to transform exponential equations |
|  | 12.7. | solve an exponential equation that models an applied problem |
|  | 12.8. | use properties of logarithms |