APPLIED ARTS DIVISION
MATH 050
6 Credit Course
Fall, 2018

COURSE OUTLINE

MATH 050

INTERMEDIATE ALGEBRA

147 HOURS
6 CREDITS

PREPARED BY: Annie-Claude Letendre, Instructor DATE: June 28, 2018
APPROVED BY: DATE:

APPROVED BY ACADEMIC COUNCIL:

RENEWED BY ACADEMIC COUNCIL:

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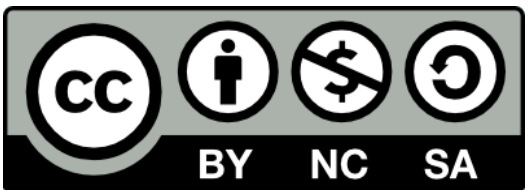

The Course Outline Template is approved by the Academic Council on June 20, 2018

APPLIED ARTS DIVISION
MATH 050
6 Credit Course
Fall, 2018

INTERMEDIATE ALGEBRA

INSTRUCTOR: Annie-Claude Letendre	**OFFICE HOURS: By appointment**
OFFICE LOCATION: A2208	**CLASSROOM:** n/a
E-MAIL: aletendre@yukoncollege.yk.ca	**TIME: n/a**
TELEPHONE: (867) 668-8850	**DATES: September 5th – April 26th**

COURSE DESCRIPTION

Intermediate Algebra consists of algebra and real numbers, solving equations and inequalities, graphs of equations and functions, trigonometry, systems of equations, polynomials and polynomial functions, rational expressions, equations and functions, radical expressions, equations and functions, quadratic equations and functions, and introductory statistics.

PREREQUISITES

High school Mathematics grade 10 with algebra, Yukon College Math 030 with the permission of the instructor, Yukon College Math 040 with a grade of B- (65%) or better, or any college equivalent with a grade of B- (65%) or better.

EQUIVALENCY OR TRANSFERABILITY

Math 050 is equivalent to current Yukon Foundations of Mathematics 11, and is transferable to colleges and universities on the BCCAT grid (http://www.bctransferguide.ca/).

LEARNING OUTCOMES

See Topic Outline

COURSE FORMAT

Self-study format: Course content will be covered with the aid of a self-study textbook and a Moodle page. The instructor will supply and organize the materials and help set up a pacing schedule for the student.

The Academic Support Centre is open regularly and students are encouraged to use as many of the tutorial hours as fit into their schedules. Please see instructor for a schedule of the hours when an instructor is available for Math 050 support.

ASSESSMENTS:

Assignments

There are ten assignments to be completed. The assignments are "open-book" and students are encouraged to use the course material provided to complete them.

Tests

There are three exams covering the contents as follows:

Exam 1	Chapters R, 1, 2
Exam 2	Chapters 3, 4, 5
Final Exam	Chapters R-5, 6, 7, Trigonometry, Statistics

EVALUATION:

10 Assignments	20%
Exam 1	25%
Exam 2	25%
Final Exam	30%
Total	100%

Rewrites:

A rewrite for a failing grade on an examination (less than 50%) may be permitted at the instructor's discretion. These examinations will be written no earlier than two weeks after the date of the original examination. The mark of the rewrite will be recorded whether or not it is higher or lower than the original; however, a maximum mark of 65% will be recorded.

"No Shows":

A student who misses an examination will receive a mark of zero for that examination, but may be permitted a rewrite. Exceptions may be made if a student receives prior

permission from the instructor, or faces an emergency. Some form of documentation of the emergency may be required.

Letter Grading: Yukon College standard letter-grade system will be used for Math 060.

REQUIRED TEXTBOOKS AND MATERIALS

Intermediate Algebra (13th ed.), by Marvin Bittinger, Judith Beecher, & Barbara Johnson (2015). Pearson Education, Inc. Boston.

Yukon College Triangles and Applications (required for Trigonometry & Statistics units) – [available at Yukon College Bookstore]

Writing paper, graph paper, ruler, pencils, and scientific calculator.

ACADEMIC AND STUDENT CONDUCT

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/ Admissions & Registration web page.

PLAGIARISM

Plagiarism is a serious academic offence. Plagiarism occurs when a student submits work for credit that includes the words, ideas, or data of others, without citing the source from which the material is taken. Plagiarism can be the deliberate use of a whole piece of work, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Students may use sources which are public domain or licensed under Creative Commons; however, academic documentation standards must still be followed. Except with explicit permission of the instructor, resubmitting work which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

YUKON FIRST NATIONS CORE COMPETENCY

Yukon College recognizes that a greater understanding and awareness of Yukon First

Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon College program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukoncollege.yk.ca/yfnccr.

ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC): lac@yukoncollege.yk.ca.

TOPIC OUTLINE

Basic Algebra Review

It is expected that learners will be able to:

- Use roster and set builder notation to name sets, and distinguish among various kinds of real numbers. Determine which of two real numbers is greater and indicate which using inequality notation.
- Graph inequalities on a number line.
- Find the absolute value of a real number.
- Add, subtract, multiply, and divide real numbers.
- Rewrite expressions with whole number exponents and evaluate exponential expressions.
- Rewrite expressions with or without negative integers as exponents.
- Simplify expressions using the rules for order of operations.
- Translate a phrase into an algebraic expression
- Evaluate an algebraic expression by substitution
- Determine whether two expressions are equivalent by completing a table of values, using commutative, associative and distributive laws.
- Simplify expressions by collecting like terms and by removing parenthesis
- Use exponential notation in multiplication and division
- Use exponential notation in raising a power to a power, and in raising a product or quotient to a power.
- Convert between decimal notation and scientific notation and use scientific notation with multiplication and division.

Solving Linear Equations and Inequalities

It is expected that learners will be able to:

- Determine whether a given number is a solution of a given equation.
- Solve equations using the addition principle, the multiplication principle, or both
- Evaluate formulas and solve formulas for a specified letter.
- Solve applied problems by translating to equations
- Solve basic motion problems.
- Determine whether a given number is a solution of an inequality
- Write interval notation for the solution set or graph of an inequality
- Solve an inequality using the addition and multiplication principles and then graph the inequality
- Solve applied problems by translating to inequalities
- Find the intersection of two sets. Solve and graph conjunctions of inequalities.
- Find the union of two sets. Solve and graph disjunctions of inequalities.
- Solve applied problems involving conjunctions and disjunctions of inequalities.
- Simplify expressions containing absolute value symbols

Graphs, Functions, and Applications

It is expected that learners will be able to:

- Plot points associated with ordered pairs of numbers
- Determine weather an ordered pair of numbers is a solution of an equation.
- Graph linear equations using tables.
- Graph non-linear equations using tables
- Determine whether a correspondence is a function.
- Given a function described by an equation, find function values for specified values.
- Draw the graph of a function.
- Determine whether a graph is that of a function using the vertical line test.
- Solve applied problems involving functions and their graphs.
- Find the domain and range of a function.
- Find the intercept of a line from the equation $y = mx + b$ or $f(x) = mx + b$.
- Given two points on a line, find the slope; given a linear equation, derive the equivalent slope-intercept equation and determine the slope and the y-intercept.
- Solve applied problems involving slope.
- Graph linear equations using intercepts.
- Given a linear equation in slope-intercept form, use the slope and the y-intercept to graph the line.
- Graph linear equations of the form $x = a$ or $y = b$.

- Given the equations of two lines, determine whether their graphs are parallel or perpendicular.
- Find the equation of a line when the slope and the y-intercept are given.
- Find the equation of a line when the slope and a point is given.
- Find the equation of a line when two points are given.
- Given a line and a point not on the given line, find an equation of the line parallel to the line and containing the point, and find an equation of the line perpendicular to the line and containing the point.
- Solve applied problems involving linear functions.
- Using a set of data, draw a representative graph of a linear function and make predictions from the graph.
- Using a set of data, choose two representative points, find a linear function using the two points, and make predictions from the function.

Triangles and Applications

It is expected that learners will be able to:

- Determine the three trigonometric ratios for a triangle not in standard position.
- Solve right triangles.
- Solve problems involving the use of right triangles and the trigonometric functions.
- Use the law of sines to solve any triangle, given a side and two angles.
- Use the law of sines to solve any triangle, given a side and two angles.
- Use the law of sines to solve triangles, given two sides and an angle opposite on of them, finding two solutions when they exist, and recognizing when a solution does not exist..
- Use the law of cosines, with the law of sines, to solve any triangle, given two sides and the included angle.
- Use the law of cosines to solve any triangle, given three sides.

Systems of Equations

It is expected that learners will be able to:

- Solve a system of two linear equations or two functions by graphing and determine whether a system is consistent or inconsistent and whether it is dependant or independent.
- Solve systems of equations in two variables by the substitution method.
- Solve systems of equations in two variables by the elimination method.
- Solve applied problems by solving systems of two equations using substitution or elimination.
- Solve applied problems involving total value and mixture using systems of two equations.
- Solve applied problems involving motion, using systems of two equations.

- Given total cost and total revenue functions, find the total profit function and the break-even point.
- Given supply and demand functions, find the equilibrium point.

Polynomials and Polynomial Functions

It is expected that learners will be able to:

- Identify the degree of each term and the degree of a polynomial; identify terms, coefficients, monomials, binomials, and trinomials; arrange polynomials in ascending or descending order; and identify the leading coefficient.
- Evaluate a polynomial function for given inputs.
- Collect like terms in a polynomial and add polynomials.
- Find the opposite of a polynomial and subtract polynomials.
- Multiply any two polynomials.
- Use the FOIL method to multiply two binomials.
- Use a rule to square a binomial.
- Use a rule to multiply a sum and a difference of the same two terms.
- For function *f* described by second-degree polynomials, find and simplify notation like f(a +h) and f(a + h) - f(a)
- Factor polynomials whose terms have a common factor.
- Factor certain polynomials with four terms by grouping.
- Factor trinomials of the type $x^2 + bx + c$.
- Factor trinomials of the type $ax^2 + bx + c$ by the FOIL method.
- Factor trinomials of the type $ax^2 + bx + c$ by the grouping method.
- Factor trinomial squares.
- Factor differences of squares.
- Factor certain polynomials with four terms by grouping and possibly using the factoring of a trinomial square or the difference of squares.
- Factor sums and differences of cubes.
- Solve quadratic and other polynomial functions by first factoring and then using the principle of zero products.
- Solve applied problems involving quadratic and polynomial equations that can be solved by factoring.

Rational Expressions, Equations, and Functions

It is expected that learners will be able to:

- Find all numbers for which a rational number is undefined or that are not in the domain of a rational function.
- Simplify rational expressions.
- Multiply, divide, add and subtract rational expressions.

- Simplify complex rational expressions.
- Solve rational equations.
- Solve work problems and certain basic problems using rational equations.
- Solve applied problems involving proportions.
- Solve motion problems using rational equations.
- Solve a formula for a letter.
- Find an equation of direct, inverse, or other kinds of variation given values of the variables.
- Solve applied problems involving direct, inverse, or other kinds of variation.

Radical Expressions, Equations, and Functions

It is expected that learners will be able to:

- Find principal square roots and their opposites, approximate square roots, find outputs of square root functions, graph square root functions, and find the domains of square root functions.
- Simplify radical expressions with perfect square radicands.
- Find cube roots, simplifying certain expressions, and find outputs of cube root functions.
- Simplify expressions involving odd and even roots.
- Write expressions with or without rational exponents, and simplify, if possible.
- Write expressions without negative exponents, and simplify, if possible.
- Use the laws of exponents with rational exponents.
- Use rational exponents to simplify radical expressions.
- Multiply, divide, add or subtract, and simplify radical expressions.
- Multiply expressions involving radicals in which some factors contain more than one term.
- Rationalize the denominator of a radical expression having one or two terms in the denominator.
- Solve radical equations with one or two radical terms.
- Solve applied problems involving radical equations.
- Solve applied problems involving the Pythagorean Theorem and powers and roots.
- Express imaginary numbers as bi, where b is a nonzero real number, and complex numbers as a + b*i*, where a and b are real numbers.

Quadratic Equations and Functions

It is expected that learners will be able to:

- Solve quadratic equations using the principle of square roots and find the x-intercepts of the graph of a related function.
- Solve quadratic equations by completing the square.

- Solve applied problems using quadratic equations.
- Solve quadratic equations using the quadratic formula, and approximate solutions using a calculator.
- Solve applied problems involving quadratic equations.
- Solve a formula for a given letter.
- Write a quadratic equation having two numbers specified as solutions.
- Solve equations that are reducible to quadratic.
- Graph quadratic functions of the type $f(x) = a(x - h)^2 + k$, finding the vertex, line of symmetry, and the maximum or minimum y-value.
- For a quadratic function given in the form $f(x) = ax^2 + bx + c$, find the vertex, the line of symmetry, and the maximum or minimum value, and graph the function.
- Find the intercepts of a quadratic function.
- Solve maximum minimum problems involving quadratic functions.
- Fit quadratic function to a set of data to form a mathematical model, and sole related applied problems.

Statistics

It is expected that learners will be able to:

- Determine the factors that must be considered when collecting data (sampling) for statistical analysis.
- Calculate sample standard deviation.
- Use sample standard deviation as a measure of sample variation.
- Calculate z-values and perform z-tests to test for differences between sample populations and a single datum value.
- Calculate confidence intervals and use these to test for differences between sample populations and a single datum value