School of Academic and Skill Development

Math 050
Intermediate Algebra
Fall 2021
6 credits

Course Outline

INSTRUCTOR	Brian Stevens	OFFICE HOURS	M_F 10:15 AM -1200 PM By Appointment only
OFFICE	N/A Appointment only	iCLASSROOM	A2204
E-MAIL	bstevens1@yuknu.ca	CLASS TIME	M-F 8:30 AM-9:50 AM
TELEPHONE		CRN	10199
Liberal Arts office: Ayamdigut Campus A2501, liberalarts@yukonu.ca, 867-668-8770			

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.

COURSE REQUIREMENTS

Prerequisite(s): BC/Yukon Foundations of Mathematics and Pre-Calculus 10, Yukon College Math 051, Math 030 with a grade of B- (65%) or better. Students planning to entire Math 050 directly from Math 030 are strongly encouraged have a grade of A (86%) or better.

EQUIVALENCY OR TRANSFERABILITY

Yukon College Math 050 is articulated as Advanced Algebraic Mathematics in the Adult Basic Education system (ABE) in British Columbia and Yukon.

ABE Advanced Algebraic Mathematics is also considered equivalent to Pre-Calculus 11 by the British Columbia Ministry of Education.

Please refer to the BC Adult Basic Education Articulation Handbook which may be found at http://www.bctransferguide.ca/"

Students are reminded that it is always the receiving institution that determines whether a course is acceptable as an applicable, equivalent course or if it may be transferred to their program for credit. Find further information at: https://www.yukonu.ca/admissions/transfer-credit

LEARNING OUTCOMES

Upon completion of Mathematics 050, students will be able to

- meet the competencies as stated for ABE Advanced Algebraic Mathematics located in the BC Adult Basic Education Articulation Handbook

- obtain the prerequisite body of knowledge and skills that will provide a basis for further academic and career/vocational training

- communicate and reason mathematically
- make connections between mathematics and its applications
- make informed decisions as contributors to society
- appreciate and value mathematics

C0URSE FORMAT

Delivery format

There will be five one-and-a-half hour classes per week. These classes will be available for remote attendance. It is expected that this course will require 3-4 hours/week of homework and additional reading. It is important to note that the time required for successful course completion will vary by individual.

The course will have homework assigned (not marked but recommended), assignments and mideterm and final exams.

EVALUATION

ASSESSMENTS

Attendance and Participation

It is the student's responsibility to attend classes. Students who miss classes are responsible for any work missed.

Homework

Students may choose to submit homework for part of their mark. If chosen, the homework will account for 6% of the course mark.

Assignments

An assignment will be submitted for each of the nine chapters covered in the course. The assignments account for 20% of the course mark.

Tests

There are three examinations in this course. There are two midterm examinations each worth approximately 25% of the course mark and a final examination worth approximately 30% of the course mark.

EVALUATION

Homework	zero	6%
Assignments	20%	20%
Exam 1	25%	23%
Exam 2	25%	23%
Final	30%	28%
Total	100%	100%

TEXTBOOKS & LEARNING MATERIALS

Bittinger, Marvin, et al, (2019). Intermediate Algebra (13th ed.)

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

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

COURSE WITHDRAWAL INFORMATION

Students may officially withdraw from a course or program without academic penalty up until two-thirds of the course contact hours have been completed. Specific withdrawal dates vary, and students should

become familiar with the withdrawal dates of their program. See withdrawal information at www.yukonu.ca/admissions/money-matters

Refer to the YukonU website for important dates: www.yukonu.ca/admissions/important-dates

Refunds may be available. See the Refund policy and procedures at www.yukonu.ca/admissions/money-matters

ACADEMIC INTEGRITY

Students are expected to contribute toward a positive and supportive environment and are required to conduct themselves in a responsible manner. Academic misconduct includes all forms of academic dishonesty such as cheating, plagiarism, fabrication, fraud, deceit, using the work of others without their permission, aiding other students in committing academic offences, misrepresenting academic assignments prepared by others as one's own, or any other forms of academic dishonesty including falsification of any information on any Yukon University document.

Please refer to Academic Regulations & Procedures (updated bi-annually) for further details about academic standing, and student rights and responsibilities: www.yukonu.ca/policies/academic-regulations

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 University Academic Regulations (available on the Yukon University website at www.yukonu.ca/policies/academic-regulations

It is the student's responsibility to seek these accommodations by contacting the Learning Assistance Centre (LAC): LearningAssistanceCentre@yukonu.ca.

TOPIC OUTLINE

Mathematics 050 covers the Core Topics as stated for ABE Advanced Level Algebraic Mathematics located in the BC Adult Basic Education Articulation Handbook which may be found at http://www.bctransferguide.ca/

Specifically:

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 whether 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.

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 + bi, 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 $f(x) = ax2 + bx + c$, 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.

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.