School of Academic & Skill Development

Yukon University

Math 051
Introductory Algebra
Fall, 2024

6 Credits

Course Outline

INSTRUCTOR	Julie Hawkins	OFFICE HOURS	Fridays – 1:00 – 3:00
OFFICE	A2301	CLASSROOM	A2103
E-MAIL	jhawkins@yukonu.ca	CLASS TIME	Mon – Fri 8:30 – 10:00 am
TELEPHONE	867-456-8606	CRN	10039
Liberal Arts office: Ayamdigut Campus A2501, liberalarts@yukonu.ca, 867-668-8770			

COURSE DESCRIPTION

Introductory Algebra consists of operations with real numbers, first degree equations and inequalities, linear equations, systems of linear equations polynomials, rational expressions, radical expressions, and right-angle trigonometry. In addition, at least one option chosen from quadratic equations, statistics, financial mathematics, and geometry will be selected depending on the goals of the class.

Introductory Algebra is intended to provide students with the necessary skills to allow them to enter Yukon University courses and programs requiring Workplace or Foundations of Mathematics 11. This course will also prepare students for Math 050 or an equivalent grade 11 algebra. Math 051 does not serve as a prerequisite for Math 060.

COURSE REQUIREMENTS

High school Mathematics Foundations and Pre-Calculus 10, Yukon University Math 030, or any college equivalent.

EQUIVALENCY OR TRANSFERABILITY

Yukon University Math 051 is articulated as Advanced Developmental Mathematics in the Adult Basic Education system (ABE) in British Columbia and Yukon.

Advanced Developmental Mathematics qualifies as the Mathematics requirement for the BC Adult Graduation Diploma or the Adult Dogwood.

Advanced Developmental Mathematics is considered to meet "Foundation Studies Mathematics" with 4 credits by the British Columbia Ministry of Education and satisfies the Grade 12 Graduation Requirements.

For more information please refer to the BC Adult Basic Education Articulation Handbook which may be found at http://www.bctransferguide.ca/ Find further information at: https://www.yukonu.ca/admissions/transfer-credit

LEARNING OUTCOMES

Upon successful completion of the course, students will be able to:

- meet the competencies as stated for ABE Advanced Level-Developmental located in the BC Adult Basic Education BC 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

COURSE FORMAT

Delivery format

This course is delivered in a blended HyFlex format. Students are expected to attend face-to-face sessions on-campus or may attend through Zoom. Students may complete some asynchronous online activities as well as in-class activities. All classes will be taught using a lecture format and all lectures will be recorded. Zoom is a synchronous (in real time) virtual format that enables face-to-face approaches to teaching and learning and allows the recording of the lectures. These classes take place at specified times. Students should plan on arriving or signing in a few minutes before class starts. Course materials will be available on the course Moodle page for students to access and print.

Workload

Students must attend all classes either in person or through Zoom. Instructional hours for this course is 1½ hrs five days a week for a total of 7.5 hrs/week. It is expected that students will need to apply approximately 2 hours per day of homework. It is important to note that the time required for successful course completion will vary by individual.

EVALUATION

Attendance, Participation & Homework

Students should either attend in person or be signed into class at assigned times. Attendance will be recorded. Attendance, on-line activities and homework checks will count towards 10% of the final course grade. If a class is missed, it is the student's responsibility to watch the recorded class video or contact the instructor to find out what was missed.

Assignments

There are 11 assignments which account for 35% of the course mark.

Assignments submitted after the due date will receive a deduction of 10%. Late assignments cannot be accepted and will receive a grade of zero after the marked ones have been returned to the class (generally 3 - 5 days). A student planning to be away on the due date must submit the assignment prior to leaving, submit on-line or make arrangements with the instructor in advance. If the due date is missed owing to an emergency, an alternate assignment may be given.

Exams

There will be one mid-term exam covering the content in Chapter R – 4, and one final exam covering all chapters with emphasis on the chapters after the midterm. The mid-term exam is worth 25% of the final course grade while the final exam is worth 30% of the final grade.

Exam

Attendance, Participation & Homework	10 %
Assignments	35 %
Midterm Exam	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 rewrite mark will be recorded whether it is higher or lower than the original. However, a maximum mark of 65% will be awarded.

No Shows

A student who misses an examination without notice will receive a mark of zero for that examination but may be permitted a rewrite. Exceptions will 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.

TEXTBOOKS & LEARNING MATERIALS

- Textbook: Elyan Martin Gay, Introductory Algebra (6th edition)
  - Available to borrow without cost from Reserves Desk at YukonU Library.
- Three-ring binder with dividers, writing paper, graph paper, ruler, pencils, scientific calculator.

Supplementary Materials

- Students Solution Manual for *Introductory Algebra* 6th edition *(posted on Moodle Page)*

- MyMathLab with EText for *Introductory Algebra*, 6th Ed. MyMathLab is an online system students can use to work through unlimited tutorial exercises correlated to the exercises in their textbook. The system also contains multimedia tutorials.

- Interactive DVD Lecture Series for *Introductory Algebra*, 6th edition. A complete lecture for each section of the text highlights key examples and exercises. Shorter, objective-level video clips are also available for student ease of use "Pop-ups" reinforce key terms, definitions, and concepts while Martin-Gay presents the material.

- Video Organizer for *Introductory Algebra*, 6th edition. The Video Organizer encourages students to take notes and work practice exercises while watching Elayn Martin-Gay's lecture series (available in MyMathLab® and on DVD). All content in the Video Organizer is presented in the same order as it is presented in the videos. Students follow along with Elayn for some exercises while they try others on their own.

- Khan Academy

It is recommended that all students have access to a computer or other device and Internet to do their studies. The minimum specifications for a student device are as follows:

Requirement	Windows-based PC	Apple Mac/macOS-based PC
Operating System	Windows 10	macOS X
Web Browser	Firefox, Edge or Google Chrome	Firefox, Edge or Google Chrome
RAM/Memory	4 GB	4 GB
Storage	5 GB of available space	5 GB of available space

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

Math 051 covers the learning outcomes and core topics of Advanced Developmental Mathematics of the Adult Basic Education found in the 2018/2019 edition of the ABE Articulation Handbook at
http://www.bctransferguide.ca/search/abe

All of the following required units will be completed.

Operations with Real Numbers
   a) write fractions as decimals and repeating decimals as fractions
   b) add, subtract, multiply and divide rational numbers
   c) evaluate powers with rational bases and integer exponents
   d) demonstrate the order of operations with rational numbers
   e) evaluate radicals with rational radicands and distinguish between exact answers and approximate answers
   f) simplify, add, subtract, multiply and divide square roots

First Degree Equations and Inequalities
   a) solve first degree equations, in one variable, including those involving parentheses
   b) solve formulas for a given variable when other variables are known
   c) solve formulas for a given variable
   d) solve first degree inequalities in one variable
   e) solve practical problems that can be solved using a first degree equation

Polynomials
   a) distinguish between monomials, binomials, trinomials and other polynomials (in one variable only)
   b) apply the laws of exponents to variable expressions with integral exponents
   c) evaluate polynomials by substitution
   d) add, subtract, and multiply polynomials
   e) factor polynomials by removing the largest common factor
   f) factor binomials of the form $a^2x^2 - b^2y^2$ and trinomials of the form $x^2 + bx + c$
   g) solve quadratic equations using the law of zero products

Rational Expressions and Equations
   a) simplify, by factoring, rational expressions consisting of polynomial numerators and either monomial, binomial, or trinomial denominators
   b) determine values for which a rational expression is undefined
   c) multiply and divide rational expressions
   d) add and subtract rational expressions consisting of monomial and/or binomial denominators
   e) solve simple rational equations and check solutions

Linear Equations
   a) graph a linear equation including the forms x = a and y = b
   b) given a linear equation or its graph, determine its
      i. slope
      ii. x- and y-intercepts
   c) determine the equation of a line, y = mx + b, given
      i. its graph
      ii. its slope and a point on the line
      iii. two points on the line

Systems of Linear Equations
   a) solve a system of first degree equations in two unknowns by graphing, substitution, and elimination methods
   b) solve practical problems that can be solved using a system of equations

Radical Expressions and Equations
   a) simplify square roots with variable radicands
   b) add, subtract, multiply and divide square roots with variable radicands
   c) solve equations with one square root containing a polynomial radicand and check for extraneous solutions

Geometry
   a) classify triangles according to angles and sides
   b) use the properties of triangles to determine the measure of sides and angles
   c) determine the measure and/or congruence of angles given a transversal and two parallel lines
   d) use the triangle congruence theorems in simple guided proofs

Trigonometry
   a) solve right triangles using one or more of
      i. the sine ratio
      ii. the cosine ratio
      iii. the tangent ratio
      iv. the Pythagorean theorem
      v. the angle sum property of triangles

Statistics
- a) determine the mean, median, mode, range and standard deviation of a set of data
- b) represent data graphically using broken line graphs and bar graphs
- c) understand how the normal curve can be used to describe a normally distributed population
- d) calculate z-scores and determine areas under the normal curve
- e) use areas under the normal curve to analyze data in terms of the probability of various events

The following units are optional.

The Quadratic Equation
- a) solve quadratic equations by factoring
- b) solve equations of the form x^2 + bx + c = 0 by completing the square
- c) solve quadratic equations by using the quadratic formula
- d) graph y = ax^2 + bx + c and determine its
    - i. x- and y-intercepts
    - ii. vertex
- e) solve practical problems that can be solved using a quadratic equation

Financial Mathematics
- a) solve simple interest problems using the formula, *I = prt* (for any variable)
- b) solve compound interest problems for A or P using $A = P\left(1 + \frac{r}{n}\right)^{nt}$
- c) find the effective interest rate using $E.R. = \left(1 + \frac{r}{n}\right)^{n} - 1$
- d) solve annuity problems using $A = \frac{nP\left[\left(1 + \frac{r}{n}\right)^{n} - 1\right]}{r}$ (for A or P only)
- e) find periodic payment using $P = \frac{A\left(\frac{r}{n}\right)}{1 - \left(1 + \frac{r}{n}\right)^{-nt}}$
- f) determine the finance charge on a loan
- g) determine the interest on a loan using tables or appropriate technology