



## COURSE OUTLINE

**MATH 051**  
**INTRODUCTORY ALGEBRA**  
**6 CREDITS**

PREPARED BY: Tom McBee, Instructor  
DATE: August 20, 2020

APPROVED BY: Dr. Andrew Richardson, Dean Applied Arts  
DATE:

APPROVED BY SENATE: June 20, 2018  
RENEWED BY SENATE:



This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-sa/4.0/>.

## **INTRODUCTORY ALGEBRA**

---

<b>INSTRUCTOR:</b> Tom McBee	<b>OFFICE HOURS:</b> TBA
<b>LOCATION:</b> NA	<b>CLASSROOM:</b> Online via Zoom
<b>E-MAIL:</b> tmcbee@yukonu.ca	<b>TIME:</b> 8:30am -9:15 am
<b>TELEPHONE:</b> 867.668.8831	<b>DATES:</b> Monday through Friday Sept. 1 <sup>st</sup> - Dec. 8 <sup>th</sup> , 2020

---

### **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 College 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.

### **PREREQUISITES**

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

### **RELATED COURSE REQUIREMENTS**

It is required 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:

<b>Requirement</b>	<b>Windows-based PC</b>	<b>Apple Mac/macOS-based PC</b>
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

### **EQUIVALENCY OR TRANSFERABILITY**

Yukon College 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/>

### **LEARNING OUTCOMES**

Upon completion of Mathematics 051, 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**

Due to COVID, lectures will be conducted using ZOOM which is a synchronous (in real time) virtual format that enables face-to-face approaches to teaching and learning. Further, due to a reduction in class time, there are greater expectations students will work independently and do more homework, approximately two hours of daily.

**ASSESSMENTS:**

Attendance & Participation

Students registered in the lecture-based courses should be in class at assigned times. Attendance and participation is graded. Quizzes, homework checks and participation in class and on-line activities will count towards 10% of the final course grade. If a class is missed, it is the student’s responsibility to find out what was missed from the instructor or a classmate.

Assignments

There are 12 assignments which account for 35% of the course mark. Assignments submitted after the due date will receive a deduction of 10%. However, assignments cannot be accepted and will receive a grade of zero after they have been returned to the class (generally three days). A student planning to be away on the due date must submit the assignment prior to leaving. If the due date is missed owing to an emergency, an alternate assignment may be given.

Tests

There will be one mid-term exam 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.

**EVALUATION:**

Assignments	35%
Midterm Exam	25%

Quizzes / Participation / Homework	10%
Final Exam	30%
Total	100%

Note: Although the passing mark for the course is 50%. Entrance requirements for various programs vary and a passing grade may not be enough for entry into a specific program. Please check the specific program outline and talk to the program advisor.

#### 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 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.

### **REQUIRED TEXTBOOKS AND MATERIAL**

Elyan Martin Gay, Introductory Algebra (5th edition)

### **SUPPLEMENTARY MATERIALS**

- Students Solution Manual for Introductory Algebra 5th edition
- MyMathLab with EText for Introductory Algebra, 5th 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, 5th 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, 5th 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

### **REQUIRED SUPPLIES AND MATERIALS**

Three-ring binder with dividers, writing paper, graph paper, ruler, pencils, 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 University.

### **ELECTRONIC DEVICES**

In order to be successful in classes and minimize distractions for others, cell phones, iPods and other electronic devices must be turned off while students are in class. If a student is required to have access to a cell phone, they should contact the instructor.

### **APPROPRIATE LANGUAGE**

In all areas of the college environment students are responsible to show respect for others; swearing, or language that is discriminatory or derogatory in relation to race, sex, ethnic background, religious beliefs, age and physical condition is not appropriate.

### **YUKON FIRST NATIONS CORE COMPETENCY**

Yukon University 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 University program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see [www.yukonu.ca/yfnccr](http://www.yukonu.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 University Academic Regulations (available on the Yukon University 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@yukonu.ca](mailto:lac@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