

	School of Health, Education and Human Services
	MATY 101 Introductory Finite Mathematics
	Term: Winter 2024 Number of Credits: 3
Course Outline	

INSTRUCTOR: Robert Ferro

E-MAIL: rferro@yukonu.ca

CLASS TIMES: Mondays 1:00 – 3:00 PM, Wednesdays 1:00 – 3:30 PM (tutorial 3:30 – 4:00 PM)

DATES: January 3 to April 8, 2024

FINAL EXAM: April 17, 2024, 1:00 – 4:00 PM

CLASSROOM: T1083

OFFICE HOURS: TBD

TELEPHONE: (867) 668-8841

OFFICE: A2303a

COURSE DESCRIPTION

This is an introductory course intended to familiarize the students with the basic concepts of arithmetic, number theory, set theory, symbolic logic, and finite mathematics. Topics include logic, sets, numeration systems, arithmetic in non-decimal systems, system of integers, elementary number theory and modular arithmetic. There will be a strong emphasis on critical thinking, problem solving, understanding concepts and their applications.

COURSE REQUIREMENTS

Prerequisite(s): University admission.

EQUIVALENCY OR TRANSFERABILITY

Receiving institutions determine course transferability. Find further information at:

<https://www.yukonu.ca/admissions/transfer-credit>

LEARNING OUTCOMES

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

- Use strategies for problem-solving to solve problems by inductive reasoning.
- Explain the basic concepts of set theory.
- Explain various concepts in logic such as statements, quantifiers, truth tables, and Euler diagrams.
- Identify some historical numeration systems and properties of mathematical systems.
- Recognize real numbers and explain selected topics from number theory.
- Use counting by systematic listing, the fundamental counting principle, and permutations and combinations to solve word problems.

COURSE FORMAT

This course will be a total of 60 class-contact hours. Course content will be covered primarily through lectures with the aid of a textbook/workbook. Some group work will also be part of the course format. The instructor sets the schedule.

Delivery format

This course will be delivered in a face-to-face format.

EVALUATION

Assignments	33%
Quizzes	12%
Midterm Exam	25%
Final Exam	30%
Total	100%

Assignments

Late assignments are subject to a late penalty of 10% per day.

Tests

There is one midterm examination and a final examination.

COURSE WITHDRAWAL INFORMATION

Refer to the YukonU website for important dates.

TEXTBOOKS & LEARNING MATERIALS

Miller, Charles D., Heeren, Vern E., Hornsby, John, & Heeren, Christopher. (2020). Mathematical ideas (14th ed.). Toronto, Ontario: Pearson Education, Inc.

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 for further details about academic standing and student rights and responsibilities.

ACCESSIBILITY AND ACADEMIC ACCOMMODATION

Yukon University is committed to providing a positive, supportive, and barrier-free academic environment for all its students. Students experiencing barriers to full participation due to a visible or hidden disability (including hearing, vision, mobility, learning disability, mental health, chronic or temporary medical condition), should contact [Accessibility Services](#) for resources or to arrange academic accommodations: access@yukonu.ca.

TOPIC OUTLINE

1. Approach to Problem Solving
 - a. introduction to inductive reasoning
 - b. investigating number patterns
 - successive differences
 - figurate numbers
 - c. problem-solving strategies
 - d. calculating, estimating, and reading graphs

2. Basic Concepts of Set Theory
 - a. symbols and terminology
 - b. Venn diagrams and subsets
 - c. operations with sets
 - d. surveys and cardinal numbers
 - e. cardinal numbers of infinite sets

3. Introduction to Logic
 - a. statements and quantifiers
 - negations
 - symbols
 - quantifiers
 - b. truth tables
 - constructing truth tables
 - equivalent statements
 - c. the conditional
 - conditional statements
 - negation of the conditional
 - converse, inverse, and contrapositive
 - biconditionals
 - d. using Euler diagrams to analyze arguments
 - e. using truth tables to analyze arguments

4. Numeration and Mathematical Systems

- a. historical numeration systems
 - Ancient Egyptian
 - Traditional Chinese
 - Mayan
 - Babylonian
 - Hindu-Arabic
 - b. arithmetic in the Hindu-Arabic system
 - c. converting between bases
 - d. clock arithmetic and modular systems
 - e. properties of mathematical systems
5. Number Theory
- a. prime and composite numbers
 - b. selected topics from number theory
 - c. greatest common factor and least common multiple
6. The Real Number System
- a. real numbers, order, and absolute value
 - b. operations, properties, and applications of real numbers
 - addition, subtraction, multiplication, division
 - order of operations
 - properties of addition and multiplication
 - applications of real numbers
 - c. rational numbers and decimal representation
 - d. irrational numbers and decimal representation
 - e. applications of decimals and percents
7. Counting Methods
- a. counting by systematic listing
 - one-part tasks
 - two-part tasks using product tables
 - tasks with three or more parts using tree diagrams
 - other systematic listing methods
 - b. the fundamental counting principle
 - c. permutations and combinations