



School of Health, Education and Human Services

MATY 101

Introductory Finite Math

Term: Winter 2022

Number of Credits: 3

Course Outline

INSTRUCTOR: Evan Harris

CLASS TIMES: Zoom, Tuesdays 9:00 AM – 11:50 AM

OFFICE HOURS: By appointment:

<https://calendly.com/evan-harris/maty101-office-hours>

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PHONE: (867) 456-6996 x1321

OFFICE: Ayamdigut Campus A2302

COURSE DESCRIPTION

COURSE REQUIREMENTS

Prerequisite(s): None

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

Weekly breakdown of instructional hours

This course will include a 3 hour lecture each week. Course content will be covered primarily through lectures, and regular (approximately weekly) assignments will be included.

Delivery format

The class-contact hours will be delivered synchronously online via Zoom. Lectures will be recorded for later viewing, but it is expected that students attend at the scheduled times as much as possible to facilitate participation.

EVALUATION

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

COURSE WITHDRAWAL INFORMATION

Refer to the YukonU website for [important dates](#).

TEXTBOOKS & LEARNING MATERIALS

Textbook: Miller, Charles D., Heeren, Vern E., Hornsby, John, & Heeren, Christopher. (2016). Mathematical ideas (14th ed.). Toronto, Ontario: Pearson Education, Inc.

Other requirements: Access to a computer with reliable internet connection

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.

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 by contacting the Learning Assistance Centre (LAC): LearningAssistanceCentre@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

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