



COURSE OUTLINE

MATY 110  
Introduction Finite Mathematics

3  
CREDITS

PREPARED BY: Robert Ferro

DATE: November, 2013

APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

**YUKON COLLEGE**

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Course Outline prepared by Robert Ferro, Nov/2013

Yukon College

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Whitehorse, YT

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School of Health, Education & Human Services  
Yukon Native Teacher Education Program  
University of Regina Credit Course  
MATH 101  
Winter 2014

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**MATH 101**  
**INTRODUCTORY FINITE MATHEMATICS I**

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**Classroom:** TBA

**Days & Times:** Monday-Thursday 9:00-10:00 a.m.

Classes from January 6 to April 11, 2014.

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**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.

### ADDITIONAL DESCRIPTION:

Mathematics 101 is not algebra, nor pre-calculus, nor calculus. This class is designed for students in disciplines such as Education or Arts who need some exposure to mathematical ideas without taking calculus. This course is a required class in the elementary education stream—many topics are pertinent to the K-12 curriculum.

### PREREQUISITES:

Admittance to the Yukon Native Education Program.

### LEARNING OUTCOMES:

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

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

### MAJOR TOPICS:

	Estimated hours
1. Approach to Problem Solving	5
2. Sets	5
3. Logic	8
4. Numeration and Mathematical Systems	7
5. Number Theory	6
6. The Real Number System	4
7. Counting Methods	4
8. Review, Midterm and Final Examinations	6

### DELIVERY METHODS/FORMAT:

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.

## COURSE REQUIREMENTS/EVALUATION:

Assignments	33%
Quizzes	12%
Term test	25%
Final examination	30%

A minimum of 50% is required to pass this course.

The percent grading system will be used in assigning a final mark.

Students should be aware that in order to become adequately competent with the material, several hours of study time per week may be required above normal classroom hours.

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

## REQUIRED TEXTBOOK:

Miller, Charles D., Heeren, Vern E., & Hornsby, John. (2012). *Mathematical ideas* (12th ed.). Toronto, Ontario: Pearson Education, Inc.

## BRIEF TOPICAL 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
  6. selected topics from number theory
  7. greatest common factor and least common multiple
  8. 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
  9. 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
  10. Examinations
    - a. midterm examination
    - b. final examination

## GRADING DESCRIPTIONS (University of Regina Calendar)

**90-99 An outstanding performance with very strong evidence of:**

- an insightful and comprehensive grasp of the subject matter;
- a clear ability to make sound and original critical evaluation of the material given;
- outstanding capacity for original creative and/or logical thought;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts both in speech and in writing.

**80-89 Very good performance with strong evidence of:**

- a comprehensive grasp of the subject matter;
- an ability to make sound critical evaluation of the material given;
- a good capacity for original, creative, and/or logical thinking;
- a very good ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts both in speech and in writing.

**70-79 Above average performance with evidence of:**

- a substantial knowledge of the subject matter;
- a good understanding of the relevant issues and a good familiarity with the relevant literature and techniques;
- some capacity for original, creative, and/or logical thinking;
- an above-average ability to organize, to analyze and to examine the subject material in a critical and constructive manner, and to express thoughts both in speech and in writing.

**60-69 A generally satisfactory and intellectually adequate performance with evidence of:**

- an acceptable basic grasp of the subject material;
- a fair understanding of the relevant issues;
- a general familiarity with the relevant literature and techniques;
- an ability to develop solutions to moderately difficult problems related to the subject material;
- a moderate ability to examine the material in a critical and analytical manner, and to express thoughts in writing.

**50-59 A barely acceptable performance with evidence of:**

- a familiarity with the subject material;
- some evidence that analytical skills have been developed;
- some understanding of relevant issues;
- some familiarity with the relevant literature and techniques;
- partially successful attempts to solve moderately difficult problems related to the subject material and to examine the material in a critical and analytical manner;
- basic competence in writing.

**0-49 An unacceptable performance.**

## YNTEP & University of Regina, Faculty of Education Summary of Academic Regulations, Professional Obligations and Reminders

*The Yukon Native Teacher Education Program is designed to be an experiential model of teacher development. Major goals of this program include: excellence in teaching; development of Yukon First Nations and Yukon curricular content; knowledge of educational issues for First Nations students as a part of all courses; ability to teach in cross cultural settings and rural Yukon communities. YNTEP students are encouraged to consider these topics in their course assignments whenever an opportunity presents itself.*

### **Professionalism**

YNTEP recognizes that those most suited to teaching are committed to the evolving goals and values of the profession and acknowledge the extent of the trust placed in teachers. Students in YNTEP therefore, must develop and practice a set of professional values and attitudes that include: respect and concern for others, discretion, honesty, open-mindedness, cooperativeness, and courage (YNTEP Handbook p. 5).

Some ways of demonstrating this include:

- 1) exemplary standards for attendance and punctuality and timely notification of absences from class;
- 2) attending class prepared to contribute by completing the identified readings and assignments;
- 3) avoiding distractions in class such as the use of cell phones, eating, or addressing individual student issues that are not part of the course syllabus during class time.

### **Attendance and Punctuality**

Regular and punctual attendance is very important in YNTEP because courses are often based on participation and experiential learning. In general, students may have 10% excused absences (including lates) from a class and can expect to lose marks for these absences. In a regular 39 hour course this would be 3.9 hours of class time. Note: Student with unresolved attendance and punctuality problems in a particular course may be excluded from writing the final exam.

Please note that the student is responsible for:

1. contacting individual instructors prior to class to report your absence. In an urgent situation you may leave a message at the YNTEP main reception 668-8781.
2. obtaining assignments and course notes from a missed class from a student who acts on your behalf.
3. obtaining a doctor's certificate in the case of a serious health issue where a student is absent for 3 or more consecutive classes. This certificate must be presented to the instructor and is also to be placed in the student's file.
4. being familiar with YNTEP Handbook on Regulations and Procedures on Attendance and Punctuality, page 4.



### **Responsibilities for Learning and Participating in Class**

A YNTEP student's attitudes and behaviour must be consistent with his/her status as a professional teacher in training. Students will be expected to follow the Yukon Teachers' Association Code of Ethics while interacting with peers, Yukon College staff, school staff and the parents and children they may come into contact in student placements. The YTA Code of Ethics is posted in each YNTEP classroom and each student will have received a copy of it in their student teaching manuals. Students are expected to be familiar with YNTEP Handbook on Regulations and Procedures on Professionalism pages 5-6.

### **Harassment**

All members of Yukon College are entitled to a professional working and learning environment free of harassment and discrimination. This entitlement, however, carries with it the expectation that all members of the College community will conduct themselves in an appropriate and responsible manner, with due respect and regard for the rights of others.

### **Late Assignments**

Action regarding late assignments may vary from instructor to instructor. Expectations or due dates for assignments, as well as the marks that may be deducted for late assignments, are noted in each course outline. Note: not all instructors allow late assignments. In any event, any extension or special considerations for submitting a late assignment must be arranged with instructor in advance of the deadline. Note: printer/computer failure on an assignment due date is not considered a valid reason for an extension. Be sure to back-up your data.

### **Submitting Assignments**

Instructor expectations also vary in regard to how assignments may be submitted to them. Some instructors accept paper copies only; others may allow assignments to be emailed. Be sure to clarify this. Expect all assignments to meet recommended standards of language competence as part of graduation requirements for YNTEP and the University of Regina and follow APA reference guidelines. See attached: Language Competence Policy Statement, U. of R., Faculty of Education.

### **Plagiarism**

Plagiarism is a form of academic dishonesty in which a student submits or presents the work/ideas of another person as his/her own. Scholarship rests upon examining and referring to the thoughts and writings of others; however, whenever such thoughts or writing are used it is the student's responsibility to acknowledge their sources when submitting or presenting assignments. Plagiarism is a serious offence with serious consequences. See YNTEP Handbook

Plagiarism will not be tolerated and will result in a failure. Please consult the following:

University of Toronto Writing Centre's "How Not to Plagiarize":  
[www.utoronto.ca/writing/plagsep.html](http://www.utoronto.ca/writing/plagsep.html).

### **Cheating**

Cheating includes, but is not limited to dishonest or attempted dishonest conduct at exams, in which books, notes, diagrams or other aides not authorized by the examiner are used. It includes communication with others to obtain information, copying from the work of others, and purposely exposing or conveying information to other students who are taking exams. (YNTEP Handbook p. 11)

### **Grounds for Faculty Probation**

Action may be taken any time a YNTEP student is suspected of unprofessional conduct, unresolved attendance/punctuality issues, poor effort/attitude toward learning and teaching, and poor grades. A student who believes that she/he has been unjustly treated at the College is encouraged to seek all appropriate avenues of redress, including discussing the concern with the instructor (an expected starting point), a Chair/ Coordinator, or a student counselor, or the Dean of Applied Arts. After such discussion if the issue remains unresolved, the student may initiate a formal appeal in writing by informing the Registrar within 10 working days of the incident or within 5 working days of receiving a final decision from the Dean. See YNTEP Handbook on Regulations and Procedures on Grounds for Action, Faculty Probation and Appeal Policy for YNTEP pages 5-8.

### **Students with Disabilities or Chronic Conditions**

Reasonable accommodations are available for students with a documented disability or chronic condition. It is the student's responsibility to seek these accommodations. If a student has a disability or chronic condition and may need accommodation to fully participate in this class, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or [lassist@yukoncollege.yk.ca](mailto:lassist@yukoncollege.yk.ca).