

University
of Regina



COURSE OUTLINE

MATY 101

INTRODUCTORY FINITE MATHEMATICS I

**45 HOURS
3.0 CREDIT COURSE**

PREPARED BY: Robert Ferro

DATE: 21 October 2016

APPROVED BY:

DATE:

APPROVED BY ACADEMIC COUNCIL: (date)

REVIEWED BY ACADEMIC COUNCIL: (date)



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INTRODUCTION TO FINITE MATHEMATICS I

INSTRUCTOR: Robert Ferro

OFFICE HOURS: TBA

OFFICE LOCATION: A2418

CLASSROOM: T1083

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TIME: Mondays & Wed 10:30 am-12pm
Tuesdays, 1-3 pm

TELEPHONE: 867.668.8841

DATES: Jan. 4 - April 21, 2017

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.

PREREQUISITES

University admission.

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.

ATTENDANCE AND PARTICIPATION

Students are expected to attend regularly, complete all assignments, come to class ready and prepared to learn, and participate actively in class activities.

Each YNTEP student is responsible for:

- Contacting your instructor prior to a class to report your absence. In an urgent situation you can contact the YNTEP reception at 668.8781.
- Catching up on missed material and any incomplete assignments.
- Obtain proper documentation (ex. doctor's note) in the event that a serious health concern affects attendance (3 or more classes).
- Familiarizing oneself with the YNTEP Handbook and the regulations relating to attendance and punctuality.

ASSESSMENTS AND EVALUATION

Assignments

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

Tests

There is one midterm examination and a final examination.

Evaluation

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

Other

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

University of Regina 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.

Responsibility for Learning Environment

A YNTEP student's attitude and behavior must be consistent with their own status as a professional teacher in training. Students are required to know and follow the University of Regina 'Harassment and Respectful University Policies', Saskatchewan Teacher Federation's Code of Ethics, Yukon Teachers Association's 'Code of Ethics' and the Yukon College 'Code of Ethics'. See the YNTEP student handbook for more details.

Cell Phone Use / Social Networking

Cell phones must be turned off during class time. If laptops / tablets are being used for class notes, social networking applications / platforms / sites (facebook, twitter, etc.) should not be accessed. Any recordings and photos must have prior instructor approval.

REQUIRED TEXTBOOK AND MATERIALS

Miller, Charles D., Heeren, Vern E., Hornsby, John, & Heeren, Christopher. (2016). *Mathematical ideas* (13th ed.). Toronto, Ontario: Pearson Education, Inc.

ACADEMIC AND STUDENT CONDUCT

Information on academic standing rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/ Admissions & Registrations web page.

PLAGIARISM

Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted

manuscript style (e.g., APA, CSE, MLA, etc.) Resubmitting a paper 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 College.

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.

ACADEMIC ACCOMMODATION

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. The LAC staff assists the student in communicating accommodations that are needed to support student success.

YUKON FIRST NATIONS CORE COMPETENCY

Yukon College 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 College program, you will be required to achieve core competency in knowledge of Yukon. The YNTEP meets the requirements of YFN Core Competency.

OTHER STUDENT SUPPORTS

Supports are available to students in the areas of academic assistance, access to computers and technology, personal counselling services and provides further information on childcare, scholarships and many other areas as well. For further information, visit the Student Services website: https://www.yukoncollege.yk.ca/student_info

**University of Regina & Faculty of Education Summary of Academic Regulations & Reminders
(Undergraduate)**

As a student at the University of Regina it is your responsibility to be aware of and to follow all academic regulations in the Undergraduate Calendar available at <http://www.uregina.ca/student/registrar/calendars-schedule.html>. Please pay particular attention to “Responsibilities of Students” (§5.1), “Student Behaviour” (§5.13) and note the policies, expectations and information as outlined below:

1. **Students with Special Needs** - Any student with a disability, injury or illness who feels they may need academic accommodation should discuss this with the course instructor after contacting the [Centre for Student Accessibility](#), located in Riddell Centre 251, phone 306-585-4631, or email accessibility@uregina.ca.
2. **Language Competence** - Students are expected to meet recommended standards of language competence as part of graduation requirements in the Faculty of Education.
3. **Attendance & Punctuality** (§5.3) - Regular and punctual attendance at classes provides a foundation for academic success, and is expected of all students. When the persistent lateness or absence of a student jeopardizes the learning or the evaluation of the work of other students in the course, the student may be subject to penalty, including being dropped from the course or being barred from writing the final examination. One written warning will be provided to the student before such action is taken.
4. **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 the course syllabus. (For example, some instructors deduct one mark for each day late.) Normally, all required elements of the program must be successfully completed by each student.
5. **Professional Conduct** - Teaching is a helping profession. In order for the profession to achieve its goals and values, to enhance the quality of public education in the Province, and protect its members and those whom it serves the Faculty of Education has established sound and reliable criteria and procedures for evaluating the suitability of aspiring teachers. The criteria specify appropriate conduct for students in teacher education. The procedures specify processes for screening, regulating and monitoring their professional conduct. The Faculty of Education has the right and responsibility to assess students' professional conduct in terms of the criteria outlined above and in terms of criteria outlined in the following documents. It will take appropriate actions in accordance with the following legislation, policies and guidelines:
 - The University of Regina Academic Regulations
 - The Canadian Teachers' Federation Code of Ethics
 - The Saskatchewan Teachers' Federation Code of Ethics
 - The Education Act, 1995, Saskatchewan
 - The Board of Teacher Education and Certification, Guiding Principles and Beliefs
 - Student Review Policy, Faculty of Education.
6. **Progress in the Program** (§11.5.2) - Under current faculty regulations, progress in the program is based on academic standing and professional development. Faculty selection and review committees determine students' eligibility to progress into all professional semesters, including internship. It is the responsibility of each student to become familiar with the selection criteria and procedures.

7. **Faculty Action:** At the end of each semester, students with poor academic records and/or unsatisfactory professional development will be subject to faculty action. Students will be required to discontinue or will be placed on faculty probation.
8. **Student Behaviour (§5.13)** - Students of the University of Regina are expected to conduct themselves responsibly and with propriety both in their studies and in their general behaviour, and are expected to abide by all policies and regulations of the University. Misconduct, which may be academic (that is, in academic studies) or non-academic (in general behaviour), is subject to disciplinary action.
9. **Academic Misconduct (§5.13.2.2)** - Acts of academic dishonesty or misconduct include acts which contravene the general principles described in §5.13.1. In this section, some of these acts are described. Others which are not explicitly described here may also be considered academic misconduct. All forms of academic misconduct are considered serious offences within the University community. For the penalties, see §5.13.5.

Cheating - Cheating constitutes academic misconduct. Cheating is dishonest behaviour (or the attempt to behave dishonestly), usually in tests or examinations. It includes:

- unless explicitly authorized by the course instructor or examiner, using books, notes, diagrams, electronic devices, or any other aids during an examination, either in the examination room itself or when permitted to leave temporarily;
- copying from the work of other students;
- communicating with others during an examination to give or receive information, either in the examination room or outside it;
- consulting others on a take-home examination (unless authorized by the course instructor
- commissioning or allowing another person to write an examination on one's behalf;
- not following the rules of an examination;
- using for personal advantage, or communicating to other students, advance knowledge of the content of an examination (for example, if permitted to write an examination early);
- altering answers on an assignment or examination that has been returned;
- taking an examination out of the examination room if this has been forbidden.

Plagiarism - Plagiarism is a form of academic dishonesty in which one person submits or presents the work of another person as his or her own, whether from intent to deceive, lack of understanding, or carelessness. Unless the course instructor states otherwise, it is allowable and expected that students will examine and refer to the ideas of others, but these ideas must be incorporated into the student's own analysis and must be clearly acknowledged through footnotes, endnotes, or other practices accepted by the academic community. Students' use of others' expression of ideas, whether quoted verbatim or paraphrased, must also be clearly acknowledged according to acceptable academic practice. It is the responsibility of each student to learn what constitutes acceptable academic practice.

Plagiarism includes the following practices:

- not acknowledging an author or other source for one or more phrases, sentences, thoughts, code, formulae, or arguments incorporated in written work, software, or other assignments (substantial plagiarism);
- presenting the whole or substantial portions of another person's paper, report, piece of software, etc. as an assignment for credit, even if that paper or other work is cited as a source in the accompanying bibliography or list of references (complete plagiarism). This includes essays found on the Internet. **Students who are uncertain what plagiarism is should discuss their methodology with their instructors.** Note: The Department of English Style Guide is available inexpensively from the University Bookstore. Students may also consult online resources.

10. **Withdrawal from a Course** - Students who are not attending but haven't formally withdrawn are still registered, are liable for fees, and will be assigned a grade of "NP" for failing to complete the course. Students may drop classes in UR Self-Service up to the deadline for withdrawing from a course without a failing grade. Changes after the deadline, must be made in their Faculty or College office,

or students may mail, fax or email registration requests (students should check with their Faculty or College office). Please consult §1.2 of the Undergraduate Calendar for refund deadlines and §3.3.5 for making changes to course registration.

11. **Deferrals** - If you become unable to complete your term work or final exams (i.e. due to illness, accident, or a death in the family), you may be eligible to apply for a deferral of final examinations and/or term work. Please consult section §5.7 of the Undergraduate Calendar and contact the Faculty of Education's Student Program Centre (ED 354, phone 306-585-4537 or email Education.Counselling@uregina.ca) or your faculty student services office as soon as possible for advice regarding deferrals.
12. **Invigilators' Rights** - An invigilator who suspects a student of cheating has the authority to ask the student to do such things as empty pockets, pencil cases, etc., and roll up their sleeves. The invigilator should ensure they have a witness when asking the student to perform the request. The invigilator should not badger the student or unduly disrupt that student's (or other students') ability to complete the examination. If the student refuses to cooperate, the invigilator can not do more except to make written note of the students' refusal when reporting on the matter under the disciplinary regulations.
13. **Harassment & Discrimination Prevention Policy (§8.4.5)** - All members of the University community 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 University community will conduct themselves in an appropriate and responsible manner, with due respect and regard for the rights of others. No member of the university community shall cause or participate in discrimination against or harassment of another person. Anyone with inquiries, seeking advice or information, looking to resolve conflict arising from harassment and discrimination or wishing to discuss alternate resolution options or file a complaint can visit HDPCRS in RC 251.14 or call 306- 585-5400 or email at respect@uregina.ca.
14. **U of R Email (<https://webmail.uregina.ca/>)** -The Registrar's Office uses EMAIL SENT TO YOUR UNIVERSITY OF REGINA EMAIL ACCOUNT as an OFFICIAL MEANS OF COMMUNICATION. For many purposes, the office will make no other form of contact. Please ensure that you monitor your university email account regularly. All students are provided email, Novell and Unix accounts. Students have a 2GB quota for email and can obtain information about their email address and password at www.uregina.ca/is/student/. If you are not receiving email, check to see if you are over quota or if you have enabled email forwarding. Email delivery cannot be guaranteed if it is being forwarded.
15. **UR Self-Service and Contact Information** - Please update your contact information at the beginning of each semester (address, email, phone numbers, etc.) at UR Self-Service: https://banner.uregina.ca/prod/sct/twbkwbis.P_WWWLogin. Using UR Self- Service, you can also change your PIN (strongly recommended); register for or drop classes; check class schedules; check grades and transfer credits; search up-to- date credit and non-credit course timetables; consult course descriptions; order & pay for textbooks; settle accounts by credit card; view and print T2202A Education Deduction Certificate; and view and print a confirmation of enrolment or unofficial transcript.

5.9 GRADING SYSTEM AND DESCRIPTIONS (University of Regina 2015-2016 UG Calendar - p. 39)

The University of Regina employs a percentage grading system. A grade of less than 50% is a failing grade for undergraduate programs.

5.9.1 GRADING DESCRIPTIONS 5.9.1.1 Percentage grades

90-100

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:

- 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;
- 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
- 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 Unacceptable performance.

5.9.1.2 Alphabetical grades With the exception of the grades of NP and XF (see “Calculation of Grade Point Averages,” below), none of the following grades has a numeric value. Grades of AG, C, and P are passing grades. Grades of F, N, NP, and XF are failing grades. The remaining grades are neutral.

SYLLABUS - 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