



Course Outline

UNIVERSITY STUDIES

**MATH 160 A
Higher Arithmetic
Fall 2013**

**3 CREDITS
3 HOURS PER WEEK**

INSTRUCTOR: Matthew Morin

Instructor Information

Name: Matthew Morin
Phone Number: 780-791-4831
Email: matthew.morin@keyano.ca
Office Number: S211E
Office Hours: Monday: 11:00 – 11:50
Tuesday: 13:00 – 13:50
Thursday: 11:00 – 11:50
Friday: 11:00 – 11:50
13:00 – 13:50

Hours of Instruction

Monday	12:00 – 12:50	Room S110
Tuesday	08:00 – 08:50	Room S110
Thursday	12:00 – 12:50	Room S110

Course Description

This course is restricted to students of Elementary Education. It will provide them with an elementary introduction to Logic, Sets, Number Theory, Representations of Numbers, Number Systems, and Arithmetical Operations.

Prerequisites

Math 30-1 or Math 30-2 or equivalent

Required/Recommended Resources

Textbook: *Arithmetical Wonderland*; Andy Liu.

Moodle: Course information will be available through Moodle.
<http://ilearn.keyano.ca>

Calculator: A basic calculator is recommended.

Course Outcomes

At the completion of the course, students will be able to:

- Compute arithmetical expressions of numbers using the correct order of operations.
- Evaluate arithmetical operations in the context of sets, logic, and other areas.
- Explain the difference between exact division and division with remainders.
- Use divisibility rules to determine whether a large number is divisible by

- certain small factors (such as 2, 3, 4, 5, 6, 8, 9, 10, 12).
- Utilize the arithmetic of remainders (modular arithmetic) to answer questions about divisibility.
 - Demonstrate how to find the greatest common divisor of a pair of numbers by comparing factors, using prime factorizations, and by using the Euclidean algorithm.
 - Compute prime factorizations and use these to answer problems regarding divisibility, such as finding greatest common divisors and least common multiples.
 - Perform basic arithmetic of numbers using alternative numeration systems.

Evaluation

Assignments	20%
Midterm Examination	30%
Final Examination	<u>50%</u>
Total:	100%

Assignments

Assignments will be assigned on an approximately week-by-week basis and will be weighted equally. Students are responsible to check Moodle often to keep apprised of the assignment problems and due dates. Assignments are to be handed-in on the due-date at the start of class. General guidelines for assignments are now described:

- Students may write in pen or pencil. However, the assignments must be neat and legible to be considered for marks. (Do not try to cram too much work in a small space!) The answer to each problem should be clearly indicated.
- If more than one page is being used, then the pages should be stapled together. (It is the student's responsibility to staple their assignment before class begins.)
- The assignment problems should be answered in order, with all work being shown.
- At the end of a "word problem," it is customary to complete the solution by writing out a sentence stating the final answer.

Tests

The Midterm Exam and Final Exam will be closed-book. The Final Exam will be cumulative, but will focus on topics from the later topics. Any basic calculator (including scientific calculators) are allowed for use during tests, but graphing calculators are not. A general synopsis of topics covered by each test will be described in-class and will be posted on Moodle prior to each test.

Grading System

Standing	Letter Grade	Grade Points
Excellent	A+	4.0
	A	4.0
	A-	3.7
Good	B+	3.3
	B	3.0
	B-	2.7
Satisfactory	C+	2.3
	C	2.0
	C-	1.7
Poor	D+	1.3
Min Pass	D	1.0
Failure	F	0.0

Performance Requirements

Student Attendance

Class attendance is essential for two reasons. First, class attendance is the primary way that we, as instructors, can facilitate a student's learning experience. Second, attending class is a good way to keep informed of matters relating the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

As is stated in the *Student Rights and Responsibilities* section of the Credit Calendar, "**Excessive or inexcusable absences can result in a poor or failing grade, loss or reduction of sponsor allowances, and/or probation or suspension.**"

Student Preparation

It is the responsibility of each student to be prepared for all classes. To get the most out of the classroom experience, students should have read the appropriate section of the textbook prior to the class that it is covered.

Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and/or readings that may be due.

Plagiarism and Cheating

Every student expects to be treated and evaluated fairly in a course. Plagiarism and cheating robs everyone of this right.

No student may submit words, ideas or data of another student or person as his or her own in any writing, project, assignment, quiz, electronic presentation, exam etc. Any work used that is not the student's own must be clearly cited as belonging to someone else. There are penalties for using other's work and not citing it. The Student's Rights & Responsibilities document clearly outlines these penalties and the appeal process.

- No learner can obtain information from another student during an exam.
- No learner can bring unauthorized information (paper or electronic) into an exam or quiz.
- No student can submit work done in another course for grading in this course without the written prior approval of the course instructor.
- No student can submit copyright protected or commercially produced materials as part or all of an assignment without proper citation & permission.

COLLEGE POLICIES

Equality, Equity and Respect

The Keyano College is committed to providing an environment of equality, equity and respect for all people within the College community. All members of this community are considered partners in developing teaching and learning contexts that are welcoming to all. Faculty, staff, and students are encouraged to use inclusive language to create a classroom atmosphere in which students' experiences and views are treated with equal respect and valued in relation to their gender, ethnic and cultural background, and sexual orientation.

Students should consult:

<http://www.keyano.ca/StudentLife/StudentConduct/IndividualRightsPolicy>

Accommodation for Students with Disabilities

Disability Support Services: Learner Assistance Program

If you have a documented disability or you think that you would benefit from some assistance from a Disabilities Counsellor, please call or visit the Disability Supports Office 780-792-5608 to book an appointment (across from the library). Services and accommodations are intended to assist you in your program of study, while maintaining the academic standards of Keyano College. We can be of assistance to you in disclosing your disability to your instructor, providing accommodations, and supporting your overall success at Keyano College.

Specialized Supports and Duty to Accommodate

Specialized Support and Duty to Accommodate are aligned with the office of Disability Support Services: Learner Assistance Program (LAP) guided by federal and provincial human rights legislation, and defined by a number of Keyano College policies. Keyano College is obligated by legislation to provide disability-related accommodations to students with identified disabilities to the point of undue hardship.

APPROXIMATE COURSE SCHEDULE

Week	Dates	Topic	Chapter Sections
1	Sept. 2—Sept. 6 (Classes begin Sept. 4)	Arithmetic, Operations and Properties	Chapter 0
2	Sept. 9—Sept. 13	More Properties of Arithmetic	Chapter 0
3	Sept. 16—Sept. 20	Set Theory	Chapter 0 / Notes
4	Sept. 23—Sept. 27	Logic	Notes
5	Sept. 30—Oct. 4	Divisibility, Divisibility Rules	Chapter 1
6	Oct. 7—Oct. 11	Greatest Common Divisor, Euclidean Algorithm	Chapter 3
7	Oct. 14—Oct. 18 (No Classes on Monday— Thanksgiving)	Extended Euclidean Algorithm, Diophantine Equations	Chapter 3 / 4
8	Oct. 21—Oct. 25	Midterm , Diophantine Equations	Chapter 4
9	Oct. 28—Nov. 1	Prime Numbers, Fundamental Theorem of Arithmetic, Applications of Primes	Chapter 5
10	Nov. 4—Nov. 8	Generating Primes	Chapter 5 / 2
11	Nov. 11—Nov. 15 (No Classes on Monday— Remembrance Day)	Remainders, Congruence,	Chapter 2
12	Nov. 18—Nov. 22	Modular Arithmetic, Divisibility Rules	Chapter 2
13	Nov. 25—Nov. 29	Historical Numeration Systems	Chapter 7
14	Dec. 2—Dec. 6	Arithmetic in alternate bases, Review	Chapter 7
	Dec. 9 - Dec. 18	Exam Period	

Please Note: This course outline may be modified to facilitate unforeseen time constraints. Date and time allotted to each topic is subject to change.

IMPORTANT DATES TO REMEMBER

Sept. 2	Labour Day, College closed
Sept. 3	Orientation Day, No classes.
Sept. 17	Last day to drop courses for Academic programs.
Oct. 14	Thanksgiving Day, College closed.
Oct. 25	Last day to withdraw without academic penalty.
Nov. 11	Remembrance Day Holiday, No classes.
Dec. 6	Last day of classes for students in Certificate, Diploma, and University Programs
Dec. 9-18	FINAL EXAM PERIOD.

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Date

Reviewed and approved by:

Louis Dingley, Chairperson

Date

Guy Harmer, Dean

Date