MATH 260E: Topics in Mathematics
3 Credits, 16 weeks, 3 hours lecture

Problem solving in different areas of mathematics. Note: This course is intended for Education students and is not open to science students.

Prerequisites: Math 160 or teaching experience at elementary or junior high school level.

Instructor

Instructor Name: Matthew Morin
Office location: S211E
Phone number: 780-791-4831
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Office Hours

Monday   14:00 – 16:00PM
Wednesday   14:00 – 16:00PM

Hours of Instruction

Monday   18:30 – 21:30PM (S112)
Wednesday   18:30 – 21:30PM (S112)

Required Resources
No course textbook. Resources available on Moodle (http://ilearn.keyano.ca).

Course Outcomes

At the completion of the course, students will be able to:
- Use recreational methods to showcase mathematical ideas and methods.
- Explain what is meant by winning and drawing strategies and apply the Sprague-Grundy method to find said strategies.
- Create graphs to model a variety of problems and utilize the structure of the graphs in order to solve the problems.
- Convert between worded statements and logic notation and evaluate the truth value of a variety of compound statements.
- Analyze arguments using the theory of logic.
- Understand and apply geometric properties and relationships to determine the measure of angles and/or measure of sides within complex figures.
- Decide whether two triangles may be congruent or similar.
- Solve linear and quadratic equations using algebraic techniques.
- Apply elimination and substitution techniques to solve systems of linear equations.
- Calculate probabilities using the classical and empirical methods and describe the difference between these methods.
- Use the addition and multiplication rule to compute probabilities of events including "or" and "and" statements.

Evaluation

Assignments	25%
Math Fair Project	10%
Midterm Exam	20%
Final Exam	45%
Total	100%

A grade of C- is required for progression or transfer.

Grading System

Descriptor	Alpha Grade	4.0 Scale	Percent	Rubric for Letter Grades
	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
Excellent	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
Good	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
Satisfactory	C	2.0	64 – 66.9	
Progression	C-	1.7	60 – 63.9	
Poor	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
Minimum Pass	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

Proposed Schedule of Topics

Week	Dates	Topic
1	May 11 – May 15	Two-Player Games (Terminology, Sprague-Grundy Method)
2	May 18 – May 22	**Holiday May 18 (Victoria Day)**, Algebra (Modelling Word Problems, Solving Quadratics / Systems of Linear Equations)
3	May 25 – May 29	Graphs (Terminology, Circuits, Colouring)
4	June 1 - June 5	Logic (Statements, Connectives, Truth Tables, Arguments), **Midterm Exam (June 3)**
5	June 8 - June 12	Geometry (Congruence, Similarity, Area)
6	June 15 - June 19	Probability (Complements and Compound Events), **Final Exam (June 17)**

Please Note:
Date and time allotted to each topic is subject to change. It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College Credit Calendar.

Performance Requirements

Assignments:

In any mathematics course the best way "to learn" is "to do." The instructor can teach you about the course ideas and demonstrate the mechanics of solving the problems—and can make it look very easy—but growing adept at solving these problems will take a lot of practice and can be a struggle. Although the assignments do not count for a large part of your final grade they are essential in preparing you for the types of problems you will be solving on the exams.

The assignments should be typed or written neatly, stapled, and handed in on the assigned due date. A cover page is not required, but the assignment should show the assignment number, the course number, and the student's name (printed, not written). The problems should be solved in the order given. A late assignment may be accepted, or may incur a penalty.

Although you may work with other students while completing assignments, it is essential that the work you present is your own—see the section on academic misconduct below. Using other students solutions as your own may result in serious academic penalties. If you work with other students on assignment problems, be sure that you know how to solve the problems and that you write out your own solutions in your own words.

Math Fair Project:

As individuals or in small groups, each "group" will be responsible for creating a project (or at least a very detailed plan) for a Math Fair activity to be used in future fairs. This activity should be approachable without any specific mathematical knowledge, but it should make use of mathematical thinking (logic, problem solving, etc.). Specific details will be provided in-class and on our Moodle page.

Tests:

All tests will be written and are closed-book. No calculators are allowed, nor should they be needed. The topics covered by each test will be described in advance in-class and these details will be posted on Moodle. These tests are meant to test how well you have "mastered" the subject matter. Satisfactory completion of the relevant assignment problems, reading the relevant textbook sections, and studying the course notes is the very minimum amount of work that should prepare you for the types of problems that could appear on a test. However, as tests are cumulative, you may be solving problems that require ideas that bridge across several sections of the course.

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a students' 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.

It is the responsibility of each student to be prepared for all classes. 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 notes that may be due.

Academic Misconduct

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person

- Handing in the same unchanged work as submitted for another assignment

Penalties for academic offences range from a verbal reprimand to dismissal from the College, and in certain circumstances may involve legal action.

Specialized Supports

Counselling and Disability Services

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

SKILL Centre

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

Authorization

This course outline has been reviewed and approved by the Program Chair.

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Matthew Morin, Instructor

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Louis Dingley, Chair   Date Authorized

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Guy Harmer, Dean   Date Authorized

Signed copies to be delivered to:
Instructor
Registrar's Office