Mathematics 20-2 INT
5 credits, 16 weeks, 6 hours lecture
Topics covered include right angle trigonometry; applications involving rates and ratios (scale relationships of 2D and 3D shapes); manipulation and application of formulas; apply the power laws on integral and rational exponents; evaluate absolute values; perform all operations (addition, subtraction, multiplication, division) on radicals; solve radical equations; graph and apply quadratic functions; solve quadratic equations; spatial reasoning. Extensions to the core materials include a Business/Arts Prep module involving the interpretation and analysis of statistical data and the utilization of inductive and deductive reasoning to prove conjectures and a Trades prep module for further exploration of 3D objects (model, draw, describe, scale diagrams, etc.) and the creation and interpretation of circle and line graphs.
Alberta Education Equivalency: Math 20-2
Prerequisite: Math 10 C

INSTRUCTOR

Gillian Whalen
Conklin
780-559-2434
587-646-4358

https://meetings.keyano.ca/intgillianwhalen/

gillian.whalen@keyano.ca

OFFICE HOURS

Monday   11:00 – 12:00, 1:00 – 2:00
Tuesday   4:00 – 5:00
Wednesday   1:00 – 2:00
Thursday   2:00 – 3:00

HOURS OF INSTRUCTION

Monday   9:00 – 10:50
Tuesday   2:00 – 3:50
Wednesday   2:00 – 3:50

REQUIRED TEXTBOOKS AND SUPPLIES

Textbook: Principles of Mathematics 11: Alberta (Nelson)
 Materials: Scientific calculator or a graphing calculator (TI-83), Geometry Set,
        Graph paper, binder, ruled paper, pencils, pen, and eraser

***ilearn access is required to download course materials and to complete and submit assignments.

COURSE OUTCOMES

General Math Program Outcomes:

Students will
- ✓ Develop spatial sense and proportional reasoning
- ✓ Develop algebraic reasoning and number sense
- ✓ Develop algebraic and graphical reasoning through the study of relations

Course Outcomes:

Upon successful completion of Math 20-2, students will be able to:
- ✓ Solve problems that involve the application of rates.
- ✓ Solve problems that involve scale diagrams using proportional reasoning.
- ✓ Demonstrate an understanding of the relationships among scale factors, areas, surface areas and volumes of similar 2-D shapes and 3-D objects.
- ✓ Derive proofs that involve the properties of angles and triangles.
- ✓ Solve problems that involve properties of angles and triangles.
- ✓ Solve problems that involve the cosine law and the sine law, excluding the ambiguous case.
- ✓ Analyze and prove conjectures using inductive and deductive reasoning to solve problems.
- ✓ Analyze puzzles and games that involve spatial reasoning using problem solving strategies.
- ✓ Solve problems that involve operations on radicals and radical expressions with numerical and variable radicands (limited to square roots).
- ✓ Solve problems that involve radical equations (limited to square roots or cube roots).
- ✓ Demonstrate an understanding of normal distribution, including:
  - standard deviation
  - z-scores
- ✓ Interpret statistical data using confidence intervals, confidence levels and margin of error
- ✓ Demonstrate an understanding of the characteristics of quadratic functions, including vertex, intercepts, domain and range and axis of symmetry.
- ✓ Solve problems that involve quadratic equations.

✓ Research and give a presentation on a historical event or area of interest that involves mathematics.

EVALUATION

Type	Weighting
Assignments	30%
Tests	40%
Final Exam	30%
Total	100%

The minimum pre-requisite for progression is 1.7 (refer to Grading System)

GRADING SYSTEM

Descriptor	4.0 Scale	Percent
	4.0	96 – 100
Excellent	4.0	90 – 95
	3.7	85 – 89
	3.3	81 – 84
Good	3.0	77 – 80
	2.7	73 – 76
	2.3	69 – 72
Satisfactory	2.0	65 – 68
Minimum Prerequisite	1.7	60 – 64
Poor	1.3	55 – 59
Minimum Pass	1.0	50 – 54
Failure	0.0	0 – 49

Proposed Topics:

Chapter 1: Inductive & Deductive Reasoning

    1.1. Making Conjectures: Inductive Reasoning

    1.2. Exploring the validity of conjectures

    1.3. Using reasoning to find a counterexample to a conjecture

    1.4. Proving conjectures: deductive reasoning

    1.5. Proofs that are not valid

    1.6. Reasoning to solve problems

1.7. Analyzing puzzles and games

2. Chapter 2: Properties of Angles & Triangles

   2.1. Exploring parallel lines

   2.2. Angles formed by parallel lines

   2.3. Angle properties in triangles

   2.4. Angle properties in polygons

   2.5. Exploring congruent triangles

   2.6. Proving congruent triangles

3. Chapter 3: Acute Triangle Trigonometry

   3.1. Exploring side-angle relationships in acute triangles

   3.2. Proving and applying the Sine law

   3.3. Proving and applying the Cosine law

   3.4. Solving problems using acute triangles

4. Chapter 4: Radicals

   4.1. Mixed and entire radicals

   4.2. Adding and subtracting radicals

   4.3. Multiplying and dividing radicals

   4.4. Simplifying algebraic expressions involving radicals

   4.5. Exploring radical equations

   4.6. Solving radical equations

5. Chapter 5: Statistical Reasoning

   5.1. Exploring data
   5.2. Frequency tables, histograms, and frequency polygons
   5.3. Standard deviation
   5.4. The normal distribution
   5.5. Z-scores

   5.6. Confidence intervals

6. Chapter 6: Quadratic Functions

   6.1. Exploring quadratic relations
   6.2. Properties of graphs of quadratic functions
   6.3. Factored form of a quadratic function
   6.4. Vertex form of a quadratic function
   6.5. Solving problems using quadratic function models

7. Chapter 7: Quadratic Equations

   7.1. Solving quadratic equations by graphing
   7.2. Solving quadratic equations by factoring
   7.3. Solving quadratic equations using the quadratic formula

7.4. Solving problems using quadratic equations

Performance Requirements

1. Students are required to attend via Adobe Connect for **each** class, so success is improved by regular attendance. Extended or frequent absences cannot easily be accommodated and could impact your overall mark. Some suggestions for handling occasional absences include:
    a. Checking the Calendar of Events and PowerPoint slides covered in each chapter by logging into **ilearn Keyano** ([http://ilearn.keyano.ca)**](http://ilearn.keyano.ca)).
    b. Finding a "classroom buddy" who you can contact for details regarding what you have missed, because exact slides and daily homework will **not** be recorded on **ilearn**. Classes that have been recorded will be available on the course calendar to view.
    c. Keeping in touch with me via email. Office hours which are online, are for you to seek extra help and to see me with concerns about the course.

2. To ensure that everyone is evaluated fairly, and that you receive your marks and feedback in a timely fashion, assigned work will receive:
    a. Full marks when received on the due date. Students will need to scan and email assignments by the **end of the scheduled class** to be considered on time. All assignments must be scanned in PDF form.
    b. A mark of zero, if received after I have returned them …

3. To ensure that it is your learning, your thoughts, and your work that is being evaluated,
    a. Work submitted by non-attending students may not be marked, so please keep in touch!
    b. Any work showing evidence of copying or plagiarism will receive a mark of zero (see "Student Rights and Responsibilities" in the Credit Calendar).
    c. A missed exam (midterm) may be written at an alternate time only under certain exceptional circumstances, at the instructor's discretion. The instructor must be contacted within 24 hours of the scheduled exam, and documentation (e.g. a doctor's note) provided.
    d. The final exam will be written on the date scheduled by the College; otherwise, the procedure for "Deferred Final Examination" in the Credit Calendar is to be followed. If you are unable to write on the scheduled date, contact must be made within 48 hours with the chairperson to determine eligibility for special examinations or deferred examinations (appropriate documentation is required).

Should you have trouble logging into **ilearn Keyano, please contact any member of the library staff, or email Keyano Information and Technology Services (ITShelpdesk@keyano.ca) during business hours.

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a student's learning experience. Second, attending class is a good way to keep informed of matters relating to 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.

[Gillian, Whalen], Instructor

Lisa Turner, Chair	Date Authorized

Guy Harmer, Dean	Date Authorized