NORTHWESTERN POLYTECHNIC

DEPARTMENT OF ACADEMIC UPGRADING

COURSE OUTLINE –Winter 2023

MA0122 (A3,B3): Mathematics Grade 20-2 Equivalent–5 (6-0-0) HS 90 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR:	Doris LaChance	**PHONE:**	(780)539-2810 or 2234
OFFICE:	A205 or C202	**E-MAIL:**	dlachance@nwpolytech.ca
OFFICE HOURS:	TBD or by appointment		

CALENDAR DESCRIPTION:

Topics for this course include: inductive and deductive reasoning, spatial reasoning, properties of angles and triangles, acute triangle trigonometry, sine and cosine laws, radical expressions and equations, statistical reasoning, quadratic functions and quadratic equations, rates and proportional reasoning.

PREREQUISITE(S)/COREQUISITE:

MA0110 or equivalent math placement test score

REQUIRED TEXT/RESOURCE MATERIALS:

Appleby, Alan; Ranieri, Greg. Foundations of Mathematics 11 Workbook.Canada: Absolute Value Publications, 2011.

Non-graphing scientific calculator (TI-30XIIS recommended)

Internet access for MyClass and additional material (e.g. Desmos Graphing Calculator)

DELIVERY MODE(S): MA0122 is a modularized math course.

COURSE OBJECTIVES:

Introducing students to:

- Develop spatial sense and proportional reasoning.
- Develop spatial sense.
- Develop number sense and logical reasoning.
- Develop statistical reasoning.
- Develop algebraic and graphical reasoning through the study of relations.

LEARNING OUTCOMES:

As a result of taking this course, students will gain the ability to demonstrate the knowledge below.

Measurement

- o Solve problems that involve application of rates; interpret rates in a given context. Draw a graph to represent rate and explain the relationship between slope and rate.
- o Solve problems that involve scale diagrams, using proportional reasoning.
- o Demonstrate an understanding of the relationships among scale factors, areas, surface areas and volumes of similar 2-D and 3-D objects.

Mathematical Reasoning:

- o Analyze and prove conjectures, using inductive and deductive reasoning, to solve problems
- o Analyze puzzles and games that involve spatial reasoning, using problem-solving strategies.

Reasoning with Angles and Triangles:

- o Derive proofs that involve the properties of angles and triangles.
- o Generalize the relationships between pairs of angles formed by transversals and parallel lines.

Trigonometry:

- o Solve problems that involve properties of angles and triangles as well as congruent triangles.
- o Solve problems that involve the cosine law and the sine law, excluding the ambiguous case.

Statistics:

- o Demonstrate an understanding of normal distribution, including standard deviation and z-scores. Explain, using examples, the properties of a normal curve, including the mean, median, mode, standard deviation, symmetry and area under the curve. Solve contextual problems involving interpretation of standard deviation, determine z-scores, and solve problems that involve normal distribution.
- o Interpret statistical data using confidence intervals, confidence levels and margin of error. Make inferences and support a position by analyzing statistical data.

Radicals:

- o Solve problems that involve operations on radicals and radical expressions with numerical and variable radicands (limited to square roots). Simplify radicals, express radicals as mixed or entire, and rationalize monomial denominators.
- o Solve problems that involve radical equations (limited to square roots or cube roots); determine restrictions on the variable, determine and verify roots, identify and define extraneous roots.

Quadratic Functions

- o Demonstrate an understanding of and determine the characteristics of quadratic functions including: vertex, intercepts, domain and range, and axis of symmetry. Sketch the graph of a quadratic function. Solve contextual problems involving the characteristics of a quadratic function.

Quadratic Equations

- o Solve problems that involve quadratic equations. Determine intercepts and roots using factoring and the quadratic formula. Relate roots of a quadratic equation to zeroes of the corresponding quadratic function and x-intercepts of the graph of a function. Express a quadratic equation in factored form given the zeroes of the corresponding quadratic function or x-intercepts of the graph of the function. Solve contextual problems using a quadratic equation.

TRANSFERABILITY:

This course is listed in the Alberta Transfer Guide. It is accepted at colleges and universities in Alberta as equivalent to Math 10C. Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page http://www.transferalberta.ca.

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. **Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability.**

EVALUATIONS:

3 section tests (best 3 out of 4)	30 %
Midterm	25 %
Final Exam	45 %

**Note: Even though 50% is a passing mark, a mark of at least 65% is recommended for success in future courses.

GRADING CRITERIA:

Alpha Grade	4-point Equivalent	Percentage Guidelines		Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	90-100		C+	2.3	67-69
A	4.0	85-89		C	2.0	63-66
A-	3.7	80-84		C-	1.7	60-62
B+	3.3	77-79		D+	1.3	55-59
B	3.0	73-76		D	1.0	50-54
B-	2.7	70-72		F	0.0	00-49

COURSE SCHEDULE/TENTATIVE TIMELINE:

See table on last page.

STUDENT RESPONSIBILITIES:

In addition to the Student Rights and Responsibilities as set out in the Northwestern Polytechnic website, the following guidelines will maintain an effective learning environment for everyone:

- Regular attendance is expected of all students in all mathematics courses. Your success in math is directly linked to your attendance. Attendance will be taken daily.
- Students are expected to be punctual. Arrive on time for classes and remain for the duration of scheduled classes.
- Refrain from disruptive talking or socializing during class time.
- Be respectful of others regarding food or beverages in the classroom. Clean up your eating area and dispose of garbage.
- Recycle paper, bottles, and cans in the appropriate containers.
- Children are not permitted in the classrooms.
- Students are expected to notify the instructor of any extenuating circumstances.
- Students are expected to turn off cell phones during class time or in labs. No unspecified electronic devices will be allowed in exams.

STATEMENT ON PLAGIARISM AND CHEATING:

Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the Northwestern Polytechnic Calendar at https://www.nwpolytech.ca/programs/calendar/ or the Northwestern Polytechnic Policy on Student Misconduct: Plagiarism and Cheating athttps://www.nwpolytech.ca/about/administration/policies/index.html
**Note: all Academic and Administrative policies are available on the same page.

Ma0122 Tentative Test Schedule

Test #	% towards final grade	Topics	Recommended Test Date	Date written	Mark
1	10%	Measurement & Mathematical Reasoning	January 23		
2	10%	Reasoning with Angles and Triangles & Trigonometry	February 8		
Midterm Exam	25%	All the above	February 13		
3	10%	Statistics & Radicals	March 14		
4	10%	Quadratic Functions & Quadratic Equations	April 10		
Final Exam	45%	All of the Above	TBA (April 14-24) 3 hour exam		

***All tests must be completed by April 10th.**

***Midterm must be completed by February 27th.**