

DEPARTMENT OF SCIENCE
COURSE OUTLINE – FALL 2022

MA1200 (A2): LINEAR ALGEBRA I – 3 (3-1-0) 60 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: Tom McLeister **PHONE:** (780) 539-2961

OFFICE: J212 **EMAIL:** tmcleister@nwpolytech.ca

**OFFICE
HOURS:** MTRF 10:00-11:00

CALENDAR DESCRIPTION:

Systems of linear equations, vectors in n-space, vector equations of lines and planes, matrix algebra, inverses and invertibility, introduction to linear transformations, subspaces of n-space, determinants, introduction to eigenvalues and eigenvectors, the dot product and orthogonality, applications in a variety of fields.

PREREQUISITE: Mathematics 30-1 or equivalent

REQUIRED TEXT/RESOURCE MATERIALS:

W. Keith Nicholson, Linear Algebra with Applications (free pdf available at: www.lyryx.com)

DELIVERY MODE(S):

Lectures:	A2	MW 8:30 – 10:00	J202
Seminars:	AS1	M 13:00 - 13:50	H211
	AS2	F 8:30 – 9:20	J228

COURSE OBJECTIVES:

The aim of this course is to present the fundamental ideas and techniques of linear algebra alongside its many applications to the natural and computing sciences.

LEARNING OUTCOMES: A successful student will be able to adequately demonstrate an understanding of the concepts stated below (among others):

Chapter 1: Systems of Linear Equations – Solutions and Elementary Operations, Gaussian Elimination, Homogeneous Equations

Chapter 2: Matrix Algebra – Matrix Additions, Scalar Multiplication and Transposition, Equations, Matrices and Transformations, Matrix Multiplication, Inverses, Elementary Matrices, Linear Transformations

Chapter 3: Determinants and Diagonalization – The Cofactor Expansion, Determinants and Matrix Inverses, Diagonalization and Eigenvalues

Chapter 4: Vector Geometry – Vectors and Lines, Projections and Planes, Dot and Cross Product

Chapter 5, 6: Vector Space – Basic Properties, Subspaces and Spanning, Independence and Dimension, Orthogonality, Rank, Similarity and Diagonalization

TRANSFERABILITY:

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:

Assignments:	15%
Quizzes:	15%
Midterms:	2 × 20% (Tentatively W Oct 21, W Nov 25)
Final Exam:	30% (Cumulative and scheduled during exam period, Dec 14-22 inclusive)

Note: There will be no make-up quizzes or exams. If a quiz/test is missed for a valid reason and proper documentation is provided, then the weight of the quiz/test will be transferred to another component. Late assignments will not be accepted.

GRADING CRITERIA: (The following criteria may be changed to suite the particular course/instructor)

Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

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: Chapter 1--6

STUDENT RESPONSIBILITIES:

Attend all lectures and seminars. If a lecture or seminar is missed, it is the student's responsibility to catch up on the material and obtain the missing lecture notes.

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 Student Rights and Responsibilities policy which can be found at <https://www.nwpolytech.ca/about/administration/policies/index.html>.

**Note: all Academic and Administrative policies are available on the same page.

FINAL EXAM: The final exam will be written during the exam period, between December 14 and December 22 inclusive, including Saturdays and evenings. It is the student's responsibility to be available to write the exam at the scheduled time. Writing early is not permitted.

CALCULATORS: Use of calculators is not permitted on the quizzes or exams.