

DEPARTMENT OF SCIENCE

COURSE OUTLINE – Fall 2023

MA1200 (B2): 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: Dr. Selcuk Aygin **PHONE:** (780) 539 2008
OFFICE: J210 **E-MAIL:** saygin@nwpolytech.ca
OFFICE HOURS: 13.20 – 14.20 Mondays, or by appointment.

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(S)/COREQUISITE: Mathematics 30-1 or equivalent

REQUIRED TEXT/RESOURCE MATERIALS: K. Kuttler, A First Course in Linear Algebra (free pdf available at: <https://lyryx.com/first-course-linear-algebra/>)

DELIVERY MODE(S):

Lecture: B2 13.00 – 14.20 T R (Room J228)

Seminar: BS1 11.30 – 12.20 M (Room J228)

LEARNING OUTCOMES:

A successful student will be able to:

- Solve systems of linear equations using Gaussian Elimination, Cramer's Rule, and inverse matrices.
- Perform matrix algebra computations, calculate matrix inverses, represent linear transformations by matrices.

- Compute determinants, find eigenvalues and eigenvectors, and diagonalize matrices.
- Find equations of lines and planes, compute dot and cross products.
- Identify subspaces of \mathbb{R}^n , find bases of subspaces, determine rank and nullity of a matrix.
- Apply these concepts to solving problems in various settings.

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.alberta.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 Tests: Each equally weighted for a total of 50% (Worthy of approximately 16.66% each). Tests will take place during Lecture Hours at the dates below.

Test Dates:

B2: Sept 26, Oct 26, Dec 5

13 Seminars: Best 10 marks out of 12, each worth 2% for a total of 20%. This mark will be based on the work submitted during scheduled seminar time.

Final Exam: Worth 30% and will be scheduled by the registrar sometime between Dec 14 and Dec 21. It is the student's responsibility to be available to write the final exam at the scheduled time.

Writing early is not permitted.

Attendance: A bonus of 2% will be given to each student who has more than 70% attendance.

GRADING CRITERIA: 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	95-100	C+	2.3	67-69
A	4.0	85-94	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:

	Class Dates	Test	Chapters
Week 1 (Sept 5-8)	Sept 5, 7		Chapter 1
Week 2 (Sept 11-15)	Sept 12, 14		Chapter 2
Week 3 (Sept 18-22)	Sept 19, 21		Chapter 2
Week 4 (Sept 25-29)	Sept 26, 28	Test 1 (Sept 26)	Chapter 3
Week 5 (Oct 2-6)	Oct 3, 5		Chapter 3
Week 6 (Oct 10-13)	Oct 10, 12		Chapter 4
Week 7 (Oct 16-20)	Oct 17, 18		Chapter 4
Week 8 (Oct 23-27)	Oct 24, 26	Test 2 (Oct 26)	Chapter 4
Week 9 (Oct 30-Nov 3)	Oct 31, Nov 2		Chapter 5
Week 10 (Nov 6-Nov 10)	Nov 7, 9		Chapter 5
Fall Break (Nov 13-17)	None		
Week 11 (Nov 20-24)	Nov 21, 23		Chapter 7
Week 12 (Nov 27-Dec 1)	Nov 28, 30		Chapter 7
Week 13 (Dec 4- Dec 8)	Dec 5, 7	Test 3 (Dec 5)	Chapter 7
Week 14 (Dec 11-12)	Dec 12		Chapter 7
Finals (Dec 14-21)			

STUDENT RESPONSIBILITIES: Students are responsible for all lecture material, seminars and readings. Students are expected to practice the material by doing problems from the textbook. Tests or seminars cannot be rescheduled. If a test or seminar is missed due to illness or an extreme misfortune the weight will be distributed evenly with the other tests or seminars. A doctor's note and/or an email with supporting documents will be required in all cases. No recording of any kind is allowed in the class, seminar or during consultation with the instructor.

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at <https://www.nwpolytech.ca/about/administration/policies/index.html>.

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