

DEPARTMENT SCIENCE
COURSE OUTLINE – Winter 2025

MA2140 (A3): Intermediate Calculus 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: Therar Kadri **PHONE:** (780) 539-2878
OFFICE: J209 **E-MAIL:** TKadri@NWPolytech.ca
OFFICE HOURS: M&W 12:30 AM -2:30 PM

CALENDAR DESCRIPTION:

The course includes infinite series; plane curves and polar coordinates; vectors and three dimensional analytic geometry; partial derivatives will be explored.

PREREQUISITE(S)/COREQUISITE: Prerequisites: MA1010 or MA1150.

REQUIRED TEXT/RESOURCE MATERIALS:

Calculus: Early Transcendentals, 9th Edition by James Stewart

DELIVERY MODE(S):

Lecture:	A3	T R	1:00 – 2:20	G111
Seminar:	AL1	M	11:30 – 12:20	G112

LEARNING OUTCOMES:

At the end of this course, students should be able to:

- Apply the definition of convergence to calculate the limit of a sequence or the sum of a convergent series.

- Apply tests of convergence to determine the behavior of an infinite series.
- Find Taylor series representations of basic functions.
- Find the slope of a line tangent to a parametric curve.
- Graph functions in polar coordinates and find slopes of tangent lines.
- Explain the concepts of limits and continuity for real-valued functions of two or more variables.
- Find derivatives of vector-valued functions and use those derivatives to describe an object's motion.
- Use partial derivatives and/or Lagrange multipliers to locate any extreme values and saddle points of a function of several variables.

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:

Quizzes & Assignments 20% (held as a weekly basis)

Midterms 2 × 20% (Tentatively Week 5: Thu Feb 6, Week 10: Thu Mar 20)

Final Exam 40% (Cumulative, during exam period Apr 14 - Apr 23)

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	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:

Weeks	Chapters
Week 1 (Jan 7,9)	11.1 Sequences 11.2 Series
Week 2 (Jan 14,16)	11.3 Integral test and estimation of sums 11.4 Comparison test
Week 3 (Jan 21,23)	11.5 Alternating series 11.6 Absolute convergence, ratio and root
Week 4 (Jan 28, 30)	11.7 Strategy for testing series 11.8 Power series 11.9 Functions as power series
Week 5 (Feb 4,6)	11.10 Taylor series 11.11 Applications
Week 6 (Feb 11,13)	12.1 Three-dimensional coordinate system 12.2 Vectors 12.3 Dot product
Winter Break (Feb 17-21)	
Week 7 (Feb 25, 27)	12.4 Cross product 12.5 Lines and planes 12.6 Quadratics surfaces
Week 8 (Mar 4, 6)	10.1 Parametric curves 10.2 Calculus of parametric curves
Week 9 (Mar 11,13)	10.3 Polar coordinates 10.4 Areas in polar coordinates
Week 10 (Mar 18,20)	13.1 Space curves 13.2 Derivatives and integrals of vector functions 13.3 Arc length and curvature
Week 11 (Mar 25,27)	13.4 Velocity and acceleration 14.1 Multivariable functions 14.2 Limits and continuity
Week 12 (Apr 1,3)	14.3 Partial derivatives 14.4 Linear approximation 14.5 The chain rule
Week 13 (Apr 8,10)	14.6 Directional derivative and gradient 14.7 Maximum and minimum 14.8 Lagrange multiplier

STUDENT RESPONSIBILITIES:

Students are responsible for all lecture material, labs and readings. Students are expected to practice the material by doing problems from the textbook. Assignments are not accepted if

handed in late. If a midterm is missed due to illness the weight will be put on the next midterm or the final. If the final is missed due to illness it will be deferred (see calendar for information). A doctor's note and a phone message or email will be required in both cases.

STATEMENT ON PLAGIARISM AND CHEATING:

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.