

SCIENCE DEPARTMENT

COURSE OUTLINE – Winter 2023

MA1130 (A3): Elementary Calculus – I (3-2-0) 75 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: J 210 **E-MAIL:** saygin@nwpolytech.ca
OFFICE HOURS: MT13.30-14.20 or by appointment.

CALENDAR DESCRIPTION: The course will include a review of analytic geometry; functions, limits, continuity; differentiation of elementary functions; applications to maxima, minima and rates; introduction to integration; Fundamental Theorem; numerical integration; and areas and other applications of the definite integral to areas.

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

REQUIRED TEXT/RESOURCE MATERIALS:

- Open textbook freely available at www.lyryx.com: Calculus: Early Transcendentals by David Guichard ([Click here](#) to go to download page!)
- Use of calculators is not permitted on the tests or exams.

DELIVERY MODE(S):

Lecture: A3 13.00 – 14.20 W F (Room J228)

Seminar: AS1 14.30 – 16.20 M (Room J226)

Seminar: AS2 14.30 – 16.20 T (Room J226)

COURSE OBJECTIVES: This course is an introduction to calculus as a basic mathematical tool in solving optimization, rate of change and area problems. The objective of the course is to provide a basic knowledge of calculus and its applications.

LEARNING OUTCOMES:

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

- State the definition of a function and describe the various ways a function can be represented.
- Find the domain and range of a function.
- Identify and sketch standard algebraic, exponential, logarithmic, trigonometric and piecewise defined functions.
- Compose functions.
- Calculate limits of functions using the limit laws.
- Identify points or intervals where a function is continuous/discontinuous.
- Calculate derivatives of functions using the limit definition and the differentiation rules.
- Estimate the value of a function at a point using the tangent line (linear) approximation or differentials.
- Calculate derivatives implicitly and solve related rates problems.
- Sketch the graph of a function and indicate the extreme values, points of inflection, asymptotes, and intervals of concavity.
- Apply calculus to solve optimization problems.
- Calculate definite integrals using Riemann sums and the Fundamental Theorem of Calculus.
- Calculate definite and indefinite integrals using substitution.
- Use the definite integral to find the area between curves.

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:

3 Tests: Each worth 16.66% for a total of 50%. Tests will take place during Lecture Hours on the dates below.

Test Dates:

Feb 1, Mar 1, Mar 29

13 Seminars: Best 10 marks out of 13, 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 April 13 and April 24. 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 3% 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	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:

A3	Dates	Test	
Week 1	Jan 4 – 6		1.1, 1.2, Ch 2
Week 2	Jan 9 – 13		Ch 2, 3
Week 3	Jan 16 – 20		Ch 3
Week 4	Jan 23 – 27		Ch 3, 4
Week 5	Jan 30 – Feb 3	Feb 1 (T1)	Ch 4
Week 6	Feb 6 – 10		Ch 4
Week 7	Feb 13 – 17		Ch 5
Winter Break	Feb 20 – 24		
Week 8	Feb 27 – Mar 3	Mar 1 (T2)	Ch 5
Week 9	Mar 6 – 10		Ch 5
Week 10	Mar 13 – 17		Ch 6
Week 11	Mar 20 – 24		Ch 6
Week 12	Mar 27 – 31	Mar 29 (T3)	Ch 6, 7
Week 13	Apr 3 – 7		Ch 7
Week 14	Apr 10 – 12		Ch 8
Final	Apr 13 – 24		

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 made up if missed. If a test or seminar is missed due to illness the weight will be distributed evenly with the other tests or seminars. A doctor's note and email 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 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.