

MATH113
Elementary Calculus I

3 Credits

Instructor: Serhat Alagoz
Phone:
Original Developer: Julian Charko
Current Developer: Serhat Alagoz
Reviewer: Judy Sarsons
Created: 01/08/1990
Revised: 22/07/2015
Approval: 22/07/2015

The Implementation Date for this Outline is 01/09/2015

Copyright©LAKELAND COLLEGE. E-mail: admissions@lakelandcollege.ca
2602 - 59 Avenue, Lloydminster, Alberta, Canada T9V 3N7 Ph: 780.871. 5700
5707 College Drive, Vermilion, Alberta, Canada T9X 1K5. Ph: 780.853.8400
Toll-free in Canada: 1 800 661 6490



MATH113 Version: 15



Elementary Calculus I

Calendar Description

Review of analytic geometry. Differentiation and integration of simple functions. Applications.

Rationale

The basic concepts and technical skills gained from this introductory calculus course provides a solid foundation for more advanced work in mathematics, and virtually all fields of pure and applied science as well as engineering.

Prerequisites

Pure Mathematics 30 or Math 30-1.

Co-Requisites

None

Course Learning Outcomes

Upon successful completion of this course, students will be able to

1. use basic concepts of the differential calculus and the integral calculus and their geometric significance.
2. illustrate the important role of the Fundamental Theorem of Calculus linking differentiation and integration.
3. demonstrate basic techniques in finding limits, identifying discontinuities, applying standard techniques to find derivatives and integrals.
4. use basic techniques of calculus to do curve sketching, solve rates-of-change problems, solve max-min problems, comprehend simple physics involving velocity and acceleration problems, and find areas under a graph.

Resource Materials

Required Text:

Thomas, G.B., Weir, M.D., & Hass, J. (2009). *Thomas' Calculus, single variable*. 12th ed.
Pearson.

Reference Text:

None

Conduct of Course

This is a 3 credit course with 3 hours of lecture and 1 hour of lab per week. (3-0-1).

Material for the course is presented during the lectures. The lab provides students the time to work on assigned and other questions.

Students must complete assignments to successfully learn the course material. **No late assignments are marked for evaluation.**

Evaluation Procedures

Grading in this course is two-fold: assignments and exams. The final grade is weighted as follows:

Assignments (10)	20%
Midterm Exam(s)	40%
Final Exam	<u>40%</u>
Total	100%

No supplemental assignments or examination re-writes are permitted in this course.

At term end, there is a record of each student's raw grades for all assignments and exams. A term summary mark based on these raw grades is computed and these marks are placed on the "marking strip" as indicated.

Grade Equivalents and Course Pass Requirements

A minimum grade of D (50%) (1.00) is required to pass this course.

Letter	F	D	D+	C-	C	C+	B-	B	B+	A-	A	A+
Percent Range	0-49	50-52	53-56	57-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
Points	0.00	1.00	1.30	1.70	2.00	2.30	2.70	3.00	3.30	3.70	4.00	4.00

Students must maintain a cumulative grade of C (GPA - Grade Point Average of 2.00) in order to qualify to graduate.

Attendance

Regular attendance is essential for success in any course. Absence for any reason does not relieve a student of the responsibility of completing course work and assignments to the satisfaction of the instructor. Poor attendance may result in the termination of a student from a course(s).

If you do not meet the established attendance requirements, your instructor will recommend that the Registrar withdraw you from the course. A failing grade of RW (Required to Withdraw) will appear on your transcript.

In cases of repeated absences due to illness, the student may be requested to submit a medical certificate. *Instructors have the authority to require attendance at classes.*

Course Units/Topics

1. Brief Refresher
 - Inequalities, Functions, Elements of Analytic Geometry
2. Limits and Continuity
 - The Basic Notions of Convergence and Infinity, Properties of Limits, Techniques of Evaluation Limits, One-sided Limits, Continuity
3. Differential Calculus
 - The Derived Function, Algebraic Rules of Differentiation (The Sum, Product, and Quotient Rules), Application of the Derivative as a Rate of Change, Velocity and Acceleration for Linear Motion Derivatives of Trigonometric Functions, The Chain Rule, Differential and Linear Approximation, Implicit Differentiation, Higher-Order Derivatives
4. Applications of Differentiation
 - Local Extrema, Applied Max-Min Problems, Rolle's Theorem and the Mean Value Theorem, Increasing and Decreasing Functions and the First Derivative Test, Concavity and the Second Derivative Test, Points of Inflection, Asymptotes and Curve Sketching

5. Integral Calculus

- Antiderivatives and Indefinite Integrals, the Method of Substitution for Indefinite Integrals, The Problem of Finding the Area Under a Graph, Riemann Sums and Definite Integrals, the Fundamental Theorem of Calculus, Integration by Substitution for Definite Integrals, Using Integration to Find Areas, some Beginning Numerical Techniques for Integration, Some Simple Applications of the Definite Integral

Note: The material for the course corresponds approximately to Chapters 1 through 5 of the textbook.



Copyright©LAKELAND COLLEGE

2602 - 59 Avenue, Lloydminster, Alberta, Canada T9V 3N7. Ph: 780.871.5700

5707 College Drive, Vermilion, Alberta, Canada T9X 1K5. Ph: 780.853.8400

Toll-free in Canada: 1 800 661 6490 E-mail: admissions@lakelandcollege.ca