

MATH115
Elementary Calculus II
3 Credits

Instructor: Serhat Alagoz
Phone: 780 871 5442
Original Developer: Julian Charko
Current Developer: Serhat Alagoz
Reviewer: Judy Sarsons
Created: 01/01/1992
Revised: 19/11/2015
Approval: 19/11/2015

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

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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



MATH115 Version: 11



Elementary Calculus II

Calendar Description

Differentiation and integration of trigonometric, exponential, and logarithmic functions. Indeterminate forms and improper integrals. Techniques of integration. Application.

Rationale

MATH 115 Elementary Calculus II is a continuation of MATH 113, Elementary Calculus I. It is intended for students who plan to enter various undergraduate programs in mathematics, engineering, computing science, or the natural sciences, for which calculus is a pre-requisite.

Prerequisites

MATH113 or MATH114 or equivalent.

Co-Requisites

None

Course Learning Outcomes

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

1. use the basic concepts of integration in solving applied problems.
2. find the derivatives and integrals of exponential, logarithmic and inverse trigonometric functions.
3. use various techniques in finding integrals.
4. use integration to find arc length, areas of revolution and in differential equations.

Resource Materials

Required Text:

Thomas, G. B., M. D. Weir, & J. Hass. *Thomas' Calculus, Single Variable*. 12th ed. Pearson, 2009. Print.

Reference Text:

Other Reference Text(s)/Handouts/Reading: As assigned by the instructor.

Conduct of Course

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

Material for the course is presented during the lectures.

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

Evaluation Procedures

The following grade distribution/weighting system will be used:

Assignments	20%
Midterm Exam(s)	40%
Final Exam	40%
	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 may 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

Unit 1. Applications of Integration

- Areas between Curves
- Volumes
- Volumes by Cylindrical Shells
- Work
- Average Value of a Function

Unit 2. Inverse Functions

- Inverse Functions
- Exponential Functions and Their Derivatives
- The Natural Logarithmic Function
- Logarithmic Functions
- The Natural Exponential Function
- Derivatives of Logarithmic Functions
- General Logarithmic and Exponential Functions
- Inverse Trigonometric Functions
- Hyperbolic Functions
- Indeterminate Forms and L'Hospital's Rule

Unit 3. Techniques of Integration

- Integration by Parts
- Trigonometric Integrals
- Trigonometric Substitution
- Integration of Rational Functions by Partial Fractions
- Strategy for Integration
- Approximate Integration
- Improper Integrals

Unit 4. Further Applications of Integration

- Arc Length
- Area of a Surface of Revolution

Unit 5. Differential Equations

- Separable Equations
- Exponential Growth and Decay



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