



Syllabus (2022-Summer)

Course Title	Calculus	Course No.	
Department/ Major	Dept. of Mathematics	Credit/Hours	
Class Time/ Classroom			
Instructor	Name: Jeehyeon Seo	Dept. of Electronic and Electrical Engineering	
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Office Hours/ Office Location			

I. Course Overview

1. Course Description

"Calculus (Latin, calculus, a small stone used for counting) is a branch of mathematics focused on limits, functions, derivatives, integrals, and infinite series. This subject constitutes a major part of modern mathematics education. It has two major branches, differential calculus and integral calculus, which are related by the fundamental theorem of calculus. Calculus is the study of change, in the same way that geometry is the study of shape and algebra is the study of operations and their application to solving equations. A course in calculus is a gateway to other, more advanced courses in mathematics devoted to the study of functions and limits, broadly called mathematical analysis. Calculus has widespread applications in science, economics, and engineering and can solve many problems for which algebra alone is insufficient." from Wikipedia

2. Prerequisites

No prerequisite is required.

3. Course Format

Lecture	Discussion/Presentation	Experiment/Practicum	Field Study	Other
100 %	0 %	0 %	0 %	0 %

(Instructor can change to match the actual format of the class.)



4. Course Objectives

The calculus course at Ewha is divided into two semesters for the students in the College of Natural Sciences. In this first course, limits, derivatives, methods of integration, applications of the integral, sequences, and series will be covered

5. Evaluation System

Midterm Exam	Final Exam	Quizzes	Presentation	Projects	Assignments	Participation	Attendance
40 %	50 %	%	%	%	%	%	10 %

- * Explanation of evaluation system:
- Grade will be determined based on combined evaluation (absolute and relative evaluation)
 - 3 late attendances are equal to 1 absence.
 - More than 10 absences will give F grade.
 - **Failure to take either the midterm or the final exam will cause F grade.**

II. Course Materials and Additional Readings

1. Required Materials

Essential Calculus – Early Transcendentals by James Stewart, 2en ed. isbn:9781133492573

2. Supplementary Materials

None

3. Optional Additional Readings

III. Course Policies

- Failure to take either the midterm or the final exam will cause F grade.



IV. Course Schedule (15 credit hours must be completed.)

Week	Date	Topics & Class Materials, Assignments
Week 1		1. Functions and Models
		2. Derivatives 2.1 Derivatives and Rates of Changes 2.2 The Derivatives as a Function
Week 2		2.3 Basic Differential Formulas 2.4 The Product and Quotient Rules
		2.5 The Chain Rule 2.6 Implicit Differentiation
Week 3		2.7 Related Rates 2.8 Linear Approximations and Differentials
		3. Inverse Functions 3.1 Inverse Functions 3.2 The Natural Logarithmic Function
Week 4		3.3 The Natural Exponential Function 3.4 General Logarithmic and Exponential Functions
		3.5 Exponential Growth and Decay 3.6 Inverse Trigonometric Functions
Week 5		3.7 Hyperbolic Functions 3.8 Indeterminate Forms and l'Hospital's Rule
		4. Applications of Differentiation
Week 6		4.1 Maximum and Minimum Values 4.2 The Mean Value Theorem
		4.3 Derivatives and Shapes of Curves
Week 7		4.4 Curve Sketching
		4.5 Optimization Problems 4.6 Newton's Method
Week 8		4.7 Antiderivatives
		Midter Exam
Week 9		5. Integrals
		5.1 Areas and Distances 5.2 The Definite Integral
Week 10		5.3 Evaluating Definite Integrals 5.4 Fundamental Theorem of Calculus
		5.5 The Substitution Rule
Week 11		6. Techniques of Integration
		6.1 Integration By Parts 6.2 Trigonometric Integrals and Substitutions
Week 12		6.3 Partial Fractions 6.4 Integration with Tables and Computer Algebra Systems
		6.5 Approximate Integration 6.6 Improper Integrals
Week 13		7. Applications of Integration 7.1 Areas between Curves
		7.2 Volumes 7.3 Volumes by Cylindrical Shells
Week 14		7.4 Arc Lengths Series
		8. Infinite Sequences and Series
Week 15		8.1 Sequences
		8.2 Series 8.3 The Integral Test
Week 16		8.4 Other Comparison Tests
		8.5 Power Series
Week 17		8.6 Representations of Functions as Power Series



Week	Date	Topics & Class Materials, Assignments
Week 14		8.7 Taylor and Maclaurin Series
		8.8 Application of Taylor Polynomials
Week 15		Final Exam
Makeup Class		

V. Special Accommodations

* According to the University regulation section #57-3, students with disabilities can request for special accommodations related to attendance, lectures, assignments, or tests by contacting the course professor at the beginning of semester. Based on the nature of the students' request, students can receive support for such accommodations from the course professor or from the Support Center for Students with Disabilities (SCSD). Please refer to the below examples of the types of support available in the lectures, assignments, and evaluations.

Lecture	Assignments	Evaluation
<ul style="list-style-type: none"> · Visual impairment : braille, enlarged reading materials · Hearing impairment : note-taking assistant · Physical impairment : access to classroom, note-taking assistant 	Extra days for submission, alternative assignments	<ul style="list-style-type: none"> · Visual impairment : braille examination paper, examination with voice support, longer examination hours, note-taking assistant · Hearing impairment : written examination instead of oral · Physical impairment : longer examination hours, note-taking assistant

- Actual support may vary depending on the course.

* The contents of this syllabus are not final—they may be updated.