

Extended Syllabus

(2020 Summer)

Course Title	Calculus I
Credit	3
Class Time	Mon, Tue, Wed, Thu

Instructor's Photo	Name: Hyun Jung Kim
	E-mail: kimhj97@sogang.ac.kr
	Office: RA 201-F

I. Course Overview

1. Description							
<p>Calculus I is mainly for students of the Colleges of Sciences and Engineerings. We study on limits, differentiation, integration, differential equations and parametric equations</p>							
2. Prerequisites							
<p>The prerequisites for this course include some contact with high-school mathematics, but not necessarily great mathematical skill.</p>							
3. Course Format (%)							
Lecture	Discussion	Experiment/Practicum	Field study	Presentations	Other		
90 %	10 %	%	%	%	%		
4. Evaluation (%)							
mid-term Exam	Final exam	Quizzes	Presentations	Projects	Assignments	Participation	Other
40 %	40 %	10 %	%	%	%	10 %	%

II. Course Objectives

Knowledge: In order to understand more about "Calculus", students are required to learn why all the techniques of the high-school calculus are possible, and also learn some basic concepts of mathematics which are necessary in studying other areas of Natural Sciences and Engineering.

Skill: In the course, students have to learn how to prove some important Propositions. Sometimes students are asked to memorize the way of proving Propositions.

Attitude: The best way of obtaining mathematical knowledge and skill is to repeat what they have learned, and to read the textbook and solve the problems by themselves.

III. Course Format

The course will consist of mainly lectures. During the lectures, students can ask any questions concerning the course. Students should expect quizzes to be given at times in class.

IV. Course Requirements and Grading Criteria

The assignments will be given. In stead of collecting and correcting the assignments, I will check them via quizzes. Besides quizzes, there will be two in-class hour examinations and a comprehensive final examination. The second exam will cover the new materials together with Exam I problems, The third exam will cover the new materials together with Exam I, II problems, and the final exam will cover the new material plus Exams I, II, III problems. Students must realize that their grade will largely be based on demonstrated competence on quizzes and examinations.

V. Course Policies

For success in the course, a good attitude and an eagerness for completing assignments promptly are essential. Class attendance is a must. Students can study the references on their cell phones or with laptop computers in classes.

VI. Materials and References

Stewart, Calculus, Early Transcendentals, 8th edition

VII. Course Schedule

(* Subject to change)

Week 1 (30/06)	Learning Objectives	Limits and Derivatives
	Topics	Limits (precise definition), Implicit Differentiation; 2.4, 3.5
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Chapter 2
	Assignments	Reading assignment: Chapters 1 & 2
Week 2 (01/07)	Learning Objectives	Differentiation Rules
	Topics	Linear approximations and differentials, Hyperbolic functions; 3.10, 3.11
	Class Work (Methods)	Lecture, Quiz 1
	Materials (Required Readings)	Chapter 3
	Assignments	Reading assignment: Chapter 3
Week 3 (02/07)	Learning Objectives	Applications of Differentiation
	Topics	The Mean Value Theorem, l'Hospital's Rule; 4.2, 4.4
	Class Work (Methods)	Lecture, Quiz 2
	Materials (Required Readings)	Chapter 4
	Assignments	
Week 4 (06/07)	Learning Objectives	Applications of Integration
	Topics	Curve sketching, Newton Method; 4.5, 4.8
	Class Work (Methods)	Lecture, Exam I
	Materials (Required Readings)	Chapter 4
	Assignments	

Week 5 (07/07)	Learning Objectives	Integration Techniques
	Topics	Volumes by cylindrical shells, Trigonometric substitution, Partial fractions; 7.3, 7.4
	Class Work (Methods)	Lecture, Quiz 3
	Materials (Required Readings)	Chapter 6-7
	Assignments	
Week 6 (08/07)	Learning Objectives	Integration Techniques, Parametric equations
	Topics	Improper integrals, Calculus with parametric curves; 7.8, 10.1, 10.2
	Class Work (Methods)	Lecture, Quiz 4
	Materials (Required Readings)	Chapters 7 & 10
	Assignments	
Week 7 (09/07)	Learning Objectives	
	Topics	Mid-term Examination week
	Class Work (Methods)	Exam II
	Materials (Required Readings)	
	Assignments	
Week 8 (13/07)	Learning Objectives	Parametric equations, Infinite Sequences and Series
	Topics	Polar coordinates, Series; 10.3, 11.1, 11.2
	Class Work (Methods)	Lecture, Quiz 5
	Materials (Required Readings)	Chapters 10 & 11
	Assignments	

Week 9 (14/07)	Learning Objectives	Infinite Sequences and Series
	Topics	The Integral test and the comparison tests; 11.3, 11.4
	Class Work (Methods)	Lecture, Quiz 6
	Materials (Required Readings)	Chapter 11
	Assignments	
Week 10 (15/07)	Learning Objectives	Infinite Sequences and Series
	Topics	Alternating series, the Ratio and Root tests; 11.5, 11.6
	Class Work (Methods)	Lecture, Quiz 7
	Materials (Required Readings)	Chapter 11
	Assignments	
Week 11 (16/07)	Learning Objectives	Infinite Sequences and Series
	Topics	Power series; 11.8, 11.9
	Class Work (Methods)	Lecture, Exam III
	Materials (Required Readings)	Chapter 11
	Assignments	
Week 12 (20/07)	Learning Objectives	Infinite Sequences and Series, Vectors
	Topics	Taylor and Maclaurin series, Vectors; 11.10, 12.2
	Class Work (Methods)	Lecture, Quiz 8
	Materials (Required Readings)	Chapters 11 & 12
	Assignments	

Week 13 (21/07)	Learning Objectives	Geometry of space
	Topics	dot product, cross product; 12.3, 12.4, 13.1
	Class Work (Methods)	Lecture, Quiz 9
	Materials (Required Readings)	Chapter 12
	Assignments	
Week 14 (22/07)	Learning Objectives	Vector Functions
	Topics	arc length 13.2, 13.3 (omit curvature)
	Class Work (Methods)	Lecture, Quiz 10
	Materials (Required Readings)	Chapter 13
	Assignments	
Week 15 (23/07)	Learning Objectives	Final Exam Week
	Topics	
	Class Work (Methods)	Exam IV
	Materials (Required Readings)	
	Assignments	

VIII. Special Accommodations

IX. Aid for the Challenged Students

Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your education opportunity.