

Syllabus

Calculus III

Summer 2024

Instructor: Junyong Park, Ph.D.

Class day & time:

7/2,3,4,8,9,10,11,15,16,17,18,22,23,24,25, 14:00~17:00

Office: RA201G

Office hour: by appointment

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■ Course overview

Calculus is an essential knowledge for natural sciences and engineering. In this course, you will learn infinite series, Taylor's theorem, vectors, polar coordinates, solid analytic geometry and so on. The aim of the course is to teach the students the basic concepts of mathematics and to train them so that they may be able to apply these basic concepts to various situations and may get used to scientific thinking.

■ Course objective

In terms of knowledge, students acquire basic knowledge of calculus, the most commonly used mathematical fields in science and engineering.

In terms of skill, through calculus, students will learn how to solve problems in mathematics, science, and engineering and increase their logical thinking as well.

In terms of attitude, Calculus is the basic of modern mathematical theory. Students need to learn thoroughly both basic calculations and theoretical background in order to properly understand calculus.

■ Prerequisites

Students need basic knowledge of calculus at the high school level.

■ Course Requirements

All students do their best to achieve their own goals. They will learn what is a Calculus. Further, they could expect to immediately know how to proceed after reading a problem in this course.

■ Course format

Lecture: 80%

Discussion: 20%

■ Materials and References

Main textbook: Calculus, Early Transcendental, 9th

James Stewart, Daniel Clegg, Saleem Watson

Other references: any basic calculus books

■ Grading scheme

Combination of Absolute scheme and Relative scheme

mid-term exam: 40%

Final exam: 40%

HW Assignment: 10%

(There are 2~3 homeworks(Exercises) to be submitted during the course.)

Others (Attendance and Attitudes, etc.): 10%

■ Course Schedule (*Subject to change)

Day 1. July 2

Infinite series; Sequences, Series

Day 2. July 3

Infinite series; Integral test, Comparison test

Day 3. July 4

Infinite series; Alternating series, Absolute convergence, Power series

Day 4. July 8

Taylor's theorem; Taylor and Maclaurin series

Day 5. July 9

Vectors; Vectors, Dot product

Day 6. July 10

Vectors; Cross product & Summary

Day 7. July 11

Midterm exam

Day 8. July 15

Polar coordinate; Parametric equations, Polar coordinates

Day 9. July 16

Polar coordinate; Calculus in polar coordinates

Day 10. July 17

Solid analytic geometry; Three-dimensional coordinate systems

Day 11. July 18

Solid analytic geometry; Equations of lines and planes

Day 12. July 22

Solid analytic geometry; Cylinders and quadric surfaces

Day 13. July 23

Solid analytic geometry; Cylinders and quadric surfaces

Day 14. July 24

Summary

Day 15. July 25

Final exam