

Introduction to Contemporary Mathematics

Undergraduate / Graduate	Undergraduate	Registration Code	0064211
Course Category	Contemporary Liberal Arts (Natural Sciences)	Credits	2.0
Term (Semester) / Day / Period	G-I / Thu / 2 (10:30~12:00)		
Instructor	OKAMOTO Yuko		

●Goals of the Course 【Standardized across all programs】

Mathematics originated in ancient Greece as one of the oldest disciplines, and has developed as a foundation and representative field of modern natural science to the present day. Along with the deepest and most beautiful world of number theory, the vast world of mathematical science connected to various fields spreads out there. The goal of this course is to introduce you to the diverse world of modern mathematics that lies beyond mathematics up to high school. In this course, we t r y to convey that defining mathematical concepts and creations of theories are extremely human activity. Also, mathematics is established through negotiations with various disciplines such as physics, and it provides new perspectives.

●Objectives of the Course

The objective of this course is to review mathematical concepts and techniques that are frequently used not only in natural sciences but also in economics and social sciences.

●Course Contents or Plan

1. Lines and their slopes
2. Sets, equations, absolute values
3. Functions and their graphs
4. Combinations of functions
5. Transformations of functions
6. Quadratic functions
7. Polynomial functions
8. Exponential functions
9. Logarithmic functions
10. Systems of equations and inequalities
11. Linear systems, vectors and matrices
12. Derivatives
13. Extremal value problems

●Course Prerequisites and Related Courses

No formal prerequisites. Basic skills in manipulating algebraic expressions, solving equations etc. will be helpful.

●Course Evaluation Method and Criteria

The examination consists of homework (20% of the total score) and a final exam (80%).

Course withdrawal: Any student who does not participate in the final exam will get the grade W. It is not necessary to hand in a course withdrawal request.

●Study Load (Self-directed Learning Outside Course Hours)

Participants are expected to attend the lectures, read the textbook, and solve homework assignments.

●How to Respond to Questions

The instructor will be available to answer questions in class or for individual appointments by e-mail.

Textbook	Rhonda, Huettenmueller: <i>Pre-calculus demystified</i> , second edition McGraw-Hill Education; 2 edition (2012) ISBN-13: 978-0071778497
Reference Book	• Seymour Lipschutz: Schaum's outline of set theory and related topics, 2nd edition, McGraw-Hill, 1998; • Otto Bretscher: Linear Algebra with Applications, 4th edition, Pearson 2009; • Serge Lang: Short calculus, Springer-Verlag, New York, 2002.
Reference website for this Course	