

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	<ul style="list-style-type: none"> ● 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	

Introduction to Life Sciences B

Undergraduate / Graduate	Undergraduate	Registration Code	0065311
Course Category	Contemporary Liberal Arts (Natural Sciences)	Credits	2.0
Term (Semester) / Day / Period	Fall Semester / Fri / 3 (13:00~14:30)		
Instructor	VASSILEVA Maria		
<p>●Goals of the Course [Standardized across all programs] The Earth is full of living organisms in a variety of environments, and humans coexist there. In addition, most of the foods we consume, including agricultural products, are derived from the living organisms. From microorganisms to animals and plants, and from molecular-level events in cells to global environmental events in forests and oceans, the field of life science has expanded greatly. Furthermore, life science is the basis for many important issues in our daily lives, such as regenerative medicine, genome editing, functional foods, environmental purification, and bioenergy. In this lecture, students will learn the basic knowledge of modern life science, and deepen their understanding of what kind of research is currently being conducted at universities and companies.</p> <p>●Objectives of the Course In this course students will learn about the genetic makeover of life, from both micro- and macro- perspective. Students will explore what inheritance is, what is its molecular basis and how it impacts living organisms. We will also look at how genetics shapes evolution of living forms on Earth, and their interaction with the changing environment. This knowledge will allow students to understand and critically evaluate popular information related to biological themes, from biotechnology to environmental issues.</p> <p>●Course Contents or Plan Introduction to inheritance Molecular basis of genetics The process of evolution Ecology and biodiversity</p> <p>●Course Prerequisites and Related Courses No prerequisites, everyone is welcome. Even students who have not studied biology in high school, or who do not like the subject, are welcome to join.</p> <p>●Course Evaluation Method and Criteria Students' progress is evaluated through quizzes (50%) and projects (50%). Withdrawal (W) grade: Students are not required to make a formal withdrawal request to withdraw from the course. Students who do not fulfill grading requirements for a passing grade will receive a W grade.</p> <p>●Study Load (Self-directed Learning Outside Course Hours) Students will have to review the lecture material after class and complete weekly quizzes, as well as work on individual or team projects.</p> <p>●How to Respond to Questions For any questions, email the course instructor Prof. Vassileva at the provided email address</p> <p>●Notice for students The classes will be accessible as much as possible both in person and online. Exact format will be announced on NUCT.</p> <p>●Message from the Instructor Office hours can be requested any time over email</p>			
Textbook	None. All materials will be provided by the instructor.		
Reference Book	None. All materials will be provided by the instructor.		
Reference website for this Course	Designated NUCT course site		