Course number	U-LAS10 20017 LE55		
Course title (and course title in English)	Honors Mathematics A-E2 Honors Mathematics A-E2	Instructor's name, job title, and department of affiliation	Graduate School of Science Assistant Professor,Maria Stella ADAMO
Group	Natural Sciences	Field(Classification)	Mathematics(Development)
Language of instruction	English	Old group	Group B
Number of credits	2		
Number of weekly time blocks	1	Class style	Lecture (Face-to-face course)
Year/semesters	2026 • Second semester		
Days and periods	Tue.3	Target year	Mainly 1st year students
Eligible students	For science students		

[Overview and purpose of the course]

This course provides opportunities to learn mathematics in more depth for highly motivated students. It supplements and combines Calculus A and Linear Algebra A, while takes these basic courses as starting point to treat more advanced related topics.

[Course objectives]

In addition to learning advanced mathematics and proofs, students can learn how to discuss and present mathematical topics in English through this course.

[Course schedule and contents)]

Below is a list of themes that may be covered.
The actual topics of the lecture will be determined upon investigating the interests and level of the participating students. The selected topics will be covered during 14 lectures and one feedback session.

Topics on set theory (tentatively 4-6 weeks)
1.1 Sets and operations
1.2 Equivalence relations and maps
1.3 Order relations.

2. Set theoretical construction of the real numbers R (tentatively 4-6 weeks)
2.1 Peano axioms and natural numbers N
2.2 Construction of the integer numbers Z and the rational numbers Q
2.3 Construction(s) or the real numbers R.

3. Topology on R^n (tentatively 3-5 weeks)
3.1 Basic topology in R^n, the Heine-Borel Theorem
3.2 Hausdorff and metrizable spaces, the Cantor set
3.3 Homeomorphisms and 1-point compactification.

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Honors Mathematics A-E2(2)

[Course requirements]

Calculus A and Linear Algebra A. Students are strongly encouraged to take Calculus B and Linear Algebra B in parallel (or prior) to this course.

[Evaluation methods and policy]

The evaluation of the course will take into account the following criteria:
(1) homework and presentation of students during lectures (about 40%)
(2) final examination (about 60%)

The method of evaluation will be made precise at the first lecture.

[Textbooks]

Not used

[References, etc.]

（References, etc.）
Enderton, Herbert B. 『Elements of Set Theory』 （Academic Press）
Munkres, James R. 『Topology』 （Prentice Hall）
Rudin, Walter 『Principles of Mathematical Analysis』 （McGraw-Hill）

[Study outside of class (preparation and review)]

As in every mathematics courses, students should read notes carefully and repeatedly after the class, solve exercise problems and try to find alternative proofs, counterexamples, etc. After many hours of such practice, one may get an intuitive understanding of the materials covered.

[Other information (office hours, etc.)]

Students are welcome to ask questions during or at the end of the class.
There are no fixed office hours. If you wish to have a consultation, please feel free to contact the lecturer.

[Essential courses]

Faculty of Science