科目ナンバリング	U-LAS10 20017 LE55						
授業科目名<英訳>	Honors Mathematics A-E2 Honors Mathematics A-E2			担当者所属職名・氏名	理学研究科　助教　ADAMO, Maria Stella		
群	自然科学科目群			分野(分類)	数学(発展)	使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義（対面授業科目）
開講年度・開講期	2026・後期	曜時限	火3	配当学年	主として1回生	対象学生	理系向

[授業の概要・目的]

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.

[到達目標]

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

[授業計画と内容]

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.

[履修要件]

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.

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Honors Mathematics A-E2(2)

[成績評価の方法・観点]

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.

[教科書]

使用しない

[参考書等]

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

[授業外学修（予習・復習）等]

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.

[その他（オフィスアワー等）]

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.

[主要授業科目（学部・学科名）]

理学部