科目ナンバリング	U-LAS10 10011 LE55						
授業科目名 <英訳>	Linear Algebra with Exercises B Linear Algebra with Exercises B			担当者所属 職名・氏名	理学研究科　教授 理学研究科　助教	COLLINS Benoit Vincent Pierre ADAMO, Maria Stella	
群	自然科学科目群			分野(分類)	数学(基礎)	使用言語	英語
旧群	B群	単位数	3単位	週コマ数	2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	月3・火2	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]

Linear algebra is one of the fundamental and important parts of mathematics. With Linear Algebra A and B, students are expected to understand not only the fundamental concepts of vector spaces and linear mappings, but also the concrete treatments of matrices and systems of linear equations.

[到達目標]

The objective of this course is to introduce linear algebra concepts such as vector spaces, linear mappings, matrices and systems of linear equations.
In addition to learning linear algebra, students can learn how to discuss and present mathematical topics in English through this course.

[授業計画と内容]

1. Abstract Vector Spaces
(1--3) Basis, dimension, linear mappings and matrices,
(4--5) Change of bases, subspaces, direct sums, kernel and image

2. Euclidean Spaces
(6--7) Inner product, orthogonal matrices, unitary matrices,
(8--10) Orthonormal basis and orthogonal complements

3. Eigenvalues and Diagonalization of Matrices
(11--12) Eigenvalues and eigenvectors, eigenpolynomials,
(13--14) Diagonalization of symmetric matrices by orthogonal matrices (diagonalization of Hermitian matrices by unitary matrices)

The schedule is subject to change.

Total：14 classes, 1 Feedback session

[履修要件]

Students are expected to understand Calculus with Exercises A and Linear Algebra with Exercises A.

[成績評価の方法・観点]

The final grade is a comprehensive assessment based on performance in both the lecture and exercise components of the course. Students are required to attend and actively participate in both sessions to receive a passing grade. The total score is weighted as follows:
- Lecture Component (approx. 2/3 of the total grade): Evaluated by the professor in charge of lectures.
- Exercise Component (approx. 1/3 of the total grade): Evaluated by the professor in charge of exercises.

The specific evaluation criteria for both components will include a combination of the following:

Linear Algebra with Exercises B(2)へ続く↓↓↓

Linear Algebra with Exercises B(2)

1. In-class Participation: Engagement during both lecture and exercise sessions.
2. Assignments and Reports: Periodic take-home homework or technical reports.
3. Mid-term exam: A mid-term examination or equivalent evaluation may be conducted at the discretion of the instructors.
4. Final Examination: A comprehensive examination covering the course material.

The final distribution of points across these categories will be finalized based on the progression of the course.

Details will be explained in class.

[教科書]

授業中に指示する

[参考書等]

（参考書）
授業中に紹介する

[授業外学修（予習・復習）等]

To be announced.

[その他（オフィスアワー等）]

It is advisable to attend the lecture “Calculus with Exercises B” in parallel.
Students are welcome to ask questions during, at the beginning or at the end of the class.
The instructor encourages students to arrange an appointment with him if they have questions.

[主要授業科目（学部・学科名）]

理学部