MATH-111(en) **Linear algebra (english)**

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Cursus	Sem.	Type
Chemistry and chemical engineering	BA1	Obl.
Civil Engineering	BA1	Obl.
Communication systems	BA1	Obl.
Computer science	BA1	Obl.
Electrical and Electronical Engineering	BA1	Obl.
Environmental Sciences and Engineering	BA1	Obl.
Life Sciences Engineering	BA1	Obl.
Materials Science and Engineering	BA1	Obl.
Mechanical engineering	BA1	Obl.
Microtechnics	BA1	Obl.

Language of teaching	English
Coefficient	6
Session	Winter
Semester	Fall
Exam	Written
Workload	180h
Weeks	14
Hours	**6 weekly**
Courses	4 weekly
Exercises	2 weekly
Number of positions	**228**

Summary

The purpose of the course is to introduce the basic notions of linear algebra and its applications.

Content

1. Linear systems;
2. Matrix algebra;
3. Vector spaces;
4. Bases and dimension;
5. Linear applications and matrices;
6. Determinant of a matrix;
7. Eigenvalues and eigenvectors;
8. Inner product, orthogonality, quadratic forms;
9. Orthogonal & Symmetric Matrices
10. Additional topics: 10.1 Singular value decomposition. 10.2. Systems of ODEs

Keywords

vector space, linearity, matrix, determinant, orthogonality, inner product

Learning Outcomes

By the end of the course, the student must be able to:

- Accurately make standard computations relevant to linear algebra and interpret the results;
- Define and provide illustrative examples of relevant theoretical notions;
- Identify examples of relevant theoretical notions;
- Construct a simple logical argument rigorously;
- Identify some connections between linear algebra and other branches of mathematics.

Teaching methods

Lectures and exercises in the classroom

Assessment methods

Written exam

Supervision

Office hours	No
Assistant.e.s	Yes
Forum	Yes

Resources

Bibliography

Linear Algebra and its Applications / D.C. Lay et al

Ressources en bibliothèque

- Find the references at the Library

Moodle Link

- https://go.epfl.ch/MATH-111_en

Prerequisite for

Analysis II, III and IV, Numerical Analysis Statistics