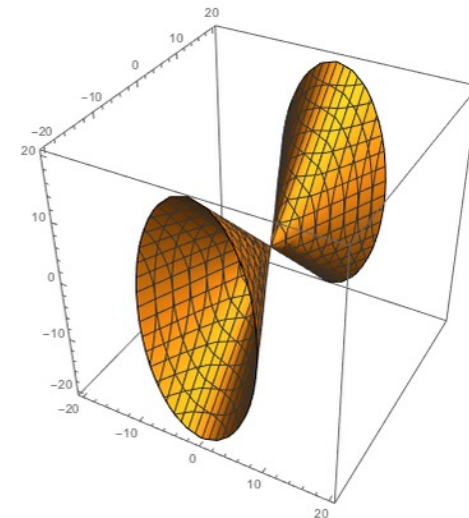


# Linear Algebra - Introduction

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$$\begin{array}{r} -2x - 3 = 4x - 15 \\ +3 \quad +3 \\ -2x = 4x - 12 \\ -4x \quad -4x \\ -6x = -12 \\ \div -6 \quad \div -6 \\ x = 2 \end{array}$$



# Why study in English?

- It is an objective fact that all companies prefer and value more employees with a **command of English**, not only at a general level, but also with a command of specific **scientific vocabulary**, since **English is the international language of Engineering**.
- By taking courses in English, you will not only learn the specific content of the subjects in the appropriate language, but you will also be able to access all the **documentation published in English** on the Internet and **communicate with people from all over the world** who study and work in the field of Engineering.

# Why do I have to study Maths?

To learn about very important **tools** for Engineering.

To learn how to **think mathematically**

The language of Maths is the **language** of Engineering.

# Why do I have to study Linear Algebra?

- **Systems of Linear Equations:** simulation and design of **electrical circuits** and **microchips**, ...
- **Vector Spaces:** **Physics**, **Control Engineering**, ...
- **Linear maps, Diagonalization:** **Materials Science:** stress tensor...
- **Affine Euclidean space:** **Physics**, **Materials Science:** angles, distances between lines, planes,...
- **Rigid motions:** **Computer-Aided Desing**, **Physics**, ...
- **Conics and quadrics:** **Computer-Aided Desing**, **Materials Science**, **Optics**, ...
- **Linear differential equations:** **Mechanics**, **Electrical circuits**, ...

# On the course

- ✓ Linear Algebra (Basic training)
- ✓ 6 ECTS (Teaching guide): Most of the work load on the student's shoulders:  
**“Life-long training” : 60 hours in class + 90 hours of student's work**

✓ ¿Where? In classroom 1.28

✓ ¿When?

Tuesday	Thursday	Friday
08:00 – 10:30 h	11:30 – 13:00 h	13:00 – 14:30 h

- ✓ Teaching and learning method: Lectures + problem solving + **student's work+ homework**

# Content

1. Systems of linear equations. Vector spaces.
2. Linear maps. Diagonalization.
3. The affine and Euclidean spaces.
4. Orthogonal Geommetry. Rigid transformations or motions
5. Conics and Quadrics.
6. Numerical Linear Algebra (Computer labwork).
7. Linear Differential Equations.

# Teaching methodology

- ✓ Motivation with applications to Engineering.
- ✓ I will try to explain you the **key ideas** about each topic that do not appear in books, videos, etc.
- ✓ Solving problems.
- ✓ Working with the Virtual Campus.

# Computer labwork

- ✓ **Topic 6**
- ✓ ¿Software? **Scilab**
- ✓ As a part of your continuous assessment





# Your role

- ✓ Work, work, work ... in the way you feel most comfortable with, but always working
- ✓ It's down to you: Discover your own way of learning (I will only offer you a small range of possibilities)
- ✓ Ask – Take Part
- ✓ BE RESPECTFUL