

What is This Class About?

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The practical side.

1. Solve $5x_1 - 2x_2 + x_3 = 9$
 $\begin{pmatrix} \text{how?} \\ \text{when?} \\ \text{how many?} \end{pmatrix} \begin{matrix} -x_1 + 2x_2 - x_3 = 2 \\ 2x_1 + 9x_2 - 3x_3 = -4 \end{matrix}$

This describes the small-scale behaviour of almost anything that has a mathematical description!

2. $\begin{matrix} \text{L} \\ \rightarrow \end{matrix} \begin{pmatrix} 5 & -2 & 1 \\ -1 & 1 & -1 \\ 2 & 9 & -3 \end{pmatrix} =: A$

"matrices": Can add, multiply, take powers: A^{2014}

This describes the approximate long-term behaviour of almost everything!

The Theory side.

3. Do all of this in a coordinate-free way and in arbitrary dimensions!

4. Do all of this over "other sets of numbers"!

The Hidden Agenda.

5. Learn the basic pure-math processes of abstraction, generalization, definitions, theorems, proof, notation, logic.

6. Tell grammatical from non-grammatical.

7. Tell right from wrong (in math).

8. Tell proven from not-proven.

9. Tell understood from not-understood!!

10. Learn to decipher my handwriting.