# Course Information A8B17CAS

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September 22 Winter semester 2025/26

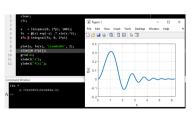


#### A8B17CAS — Motivation



#### You will learn:

- ► How to formulate and effectively solve computational problems, both numerically and symbolically (analytically).
- ▶ How to process, modify, and depict various forms of scientific and technical data.
- ▶ How to store and present the data in a systematic way.



MATLAB

 $\max\{f_1(x)\} = 0.653$  0.5 -0.5 -1  $f_1(x)$   $f_2(x)$   $f_3(x)$   $f_4(x)$ 

Data processing and presentation

MATHEMATICA

#### A8B17CAS



- ▶ 2 credits, an ungraded assessment
- ▶ 13 weeks
  - ▶ 2 blocks: Matlab (7 weeks) + Mathematica (4 weeks).
- ► Conditions of credit award:
  - ▶ Individual completion of homework assignments (50%+ points).
  - ▶ Max. 2 missed classes (more absences only after prior arrangement).
- ▶ https://cw.fel.cvut.cz/wiki/courses/a8b17cas/start

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- ▶ Slides are in English, as is the documentation of the MATLAB and MATHEMATICA.
- ▶ Do not hesitate to ask the teacher if you have any problem understanding.

#### Teachers & Contact





Miloslav Čapek Course guarantor, Matlab



Jozef Lukáč Course teacher, MATHEMATICA

Use miloslav.capek@fel.cvut.cz with "CAS | xxxxx" as the subject!

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## Course Syllabus



1	Numerical $\times$ analytical calculations, errors, Matlab, Mathematica, and others		
2	Basic operations, vectors and matrices		
3	Vectorization, indexation, relational and logical operators, logical indexing, homework		
4	Set operators, finding, sorting, branching, cycles		
5	User-defined functions Matlab program, homework		
6	Public holidays		
7	Cells, strings, structures		
8	Visualization, data processing		
9	Data management (I/O), MATLAB2Ti $k$ Z, LAT $_{\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$		
10	An Overview of Mathematica		
11	Mathematica Expressions in General		
12	Mathematica Lists, Rules and Patterns, homework		
13	Other Concepts and Utilities in Wolfram Mathematica		
14	Award a graded assessment, final discussion, feedback		

### Schedule



Week	Date	Teacher(s)	Lecture
1	22. 9.	MC	Course intro
2	29. 9.	$^{ m MC}$	Matlab #1
3	6. 10.	$^{ m MC}$	Matlab #2, $\frac{HW}{H}$ #1
4	13. 10.	$^{ m MC}$	Matlab #3
5	20. 10.	$^{ m MC}$	Matlab #4
6	27. 10.	$^{ m MC}$	Matlab #5, HW #2
7	3. 11.	$^{ m MC}$	Matlab #6
8	10. 11.	$^{ m MC}$	Matlab #7
9	17. 11.		Public holidays
10	24. 11.	JL	Матнематіса #1
11	1. 12.	$_{ m JL}$	MATHEMATICA #2
12	8. 12.	$_{ m JL}$	MATHEMATICA #3, HW #3
13	16. 12.	$_{ m JL}$	Mathematica #4
14	5. 1.	MC & JL	Credit awarding

#### AI Tools



- ▶ Our goal (and yours as well, we hope), is to teach you something new. Not just copy-paste prompts/replies from AI tools.
- ▶ Use AI tools (ChatGPT, Claude, Github Copilot, ...) if you like. But use them with caution.
- ▶ In any case, you are the sole author of the code. Be responsible. Always fully understand the code. Test it.
- ► The recommendation is not to use AI tools to accomplish the homework you can be asked about the meaning of any line.

#### Literature



- ► Matlab documentation ► Online
- ► MATHEMATICA documentation ► Online
- ► Attaway, S.: MATLAB A Practical Introduction to Programming and Problem Solving, 3rd ed., Butterworth-Heinemann, 2013.
- ▶ Valentine, D. T., Hahn, B. H.: Essential MATLAB for Engineers and Scientists, 6th Edition, Academic Press, 2017.
- ▶ Wolfram, S.: The Mathematica Book, 5th Edition, Wolfram Media Inc., 2003.
- ▶ Cleveland, W. S.: The Elements of Graphing Data, 2nd Edition, Hobart Press, 1994.
- ▶ Johnson, R. K.: The Elements of MATLAB Style, Cambridge University Press, 2010.
- ▶ Other literature and sources will be mentioned during the semester...

## Questions?

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