

Course Information

A8B17CAS

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September 22
Winter semester 2025/26



- ▶ 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.





- ▶ 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.



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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- 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), MATLAB2TikZ, L^AT_EX, homework
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- 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
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- 14 Award a graded assessment, final discussion, feedback
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Schedule



Week	Date	Teacher(s)	Lecture
1	22. 9.	MC	Course intro
2	29. 9.	MC	MATLAB #1
3	6. 10.	MC	MATLAB #2, HW #1
4	13. 10.	MC	MATLAB #3
5	20. 10.	MC	MATLAB #4
6	27. 10.	MC	MATLAB #5, HW #2
7	3. 11.	MC	MATLAB #6
8	10. 11.	MC	MATLAB #7
9	17. 11.		<i>Public holidays</i>
10	24. 11.	JL	MATHEMATICA #1
11	1. 12.	JL	MATHEMATICA #2
12	8. 12.	JL	MATHEMATICA #3, HW #3
13	16. 12.	JL	MATHEMATICA #4
14	5. 1.	MC & JL	Credit awarding



- ▶ 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.



- ▶ Lectures in PDF, see the web of the course (after log in) ▶ Online
- ▶ 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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