Course Information
A8B17CAS

Miloslav Čapek

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September 26
Winter semester 2023/24

You will learn:

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

MATLAB

Data processing and presentation

MATHEMATICA

A8B17CAS

- ▶ 2 credits, an ungraded assessment
- ▶ 14 weeks (14th week is "a reserve")
    - ▶ 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/b221/courses/a8b17cas/start

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

Miloslav Čapek
Course guarantor, MATLAB

Jozef Lukáč
Course teacher, MATHEMATICA

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

Course Syllabus

1	Numerical × 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	Cells, strings, structures
7	Visualization, data processing
8	Data management (I/O), MATLAB2TikZ, LaTeX, homework
9	Wolfram Mathematica (TBA), part 1
10	Wolfram Mathematica (TBA), part 2
11	Wolfram Mathematica (TBA), part 3, homework
12	Wolfram Mathematica (TBA), part 4
13	Award a graded assessment, final discussion, feedback
14	(Reserve)

Schedule

Week	Date	Teacher(s)	Lecture
1	26. 9.	MC	Course intro
2	3. 10.	MC	Matlab #1
3	10. 10.	MC	Matlab #2, HW #1
4	17. 10.	MC	Matlab #3
5	24. 10.	MC	Matlab #4
6	31. 10.	MC	Matlab #5, HW #2
7	7. 11.	MC	Matlab #6
8	14. 11.	MC	Matlab #7
9	21. 11.	JL	Mathematica #1
10	28. 11.	JL	Mathematica #2
11	5. 12.	JL	Mathematica #3, HW #3
12	12. 12.	JL	Mathematica #4
13	19. 12.	MC	Exercises
14	9. 1.	MC & JL	Credit awarding

Literature

- ▶ 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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