

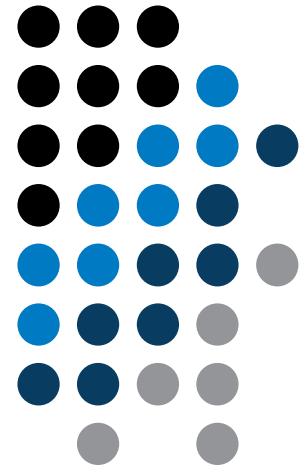
# B0B17MTB – Matlab

## Course Information



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# B0B17MTB

- 13 weeks (14<sup>th</sup> week is a ‘reserve’)
  - 11 blocks with new theory, 1 block of bonuses, 1 block of projects
- **conditions of credit award:**
  - to hand in a project (next-to-last week of the semester, 60 points)
    - **competition assignment** (see next slide)
  - to pass a test, 20 points (min. 50%, next-to-last week)
    - on top of that two short tests during semester, 20 points (min. 10 points are needed)
    - 3 bonus examples during the semester, 6 bonus points
  - max. 2 missed classes (more absences only after prior arrangement)
    - ~~any lecture can be substituted~~
- could happen that not all of the stuff of the course will be presented, because of time constraint – understanding the basics is a priority
  - bonus stuff (slides) available for advanced students
- <https://cw.fel.cvut.cz/wiki/courses/b0b17mtb/start>

Data types

Code execution

Visualization

Relation and logical operators

Matrix operations

User scripts and functions

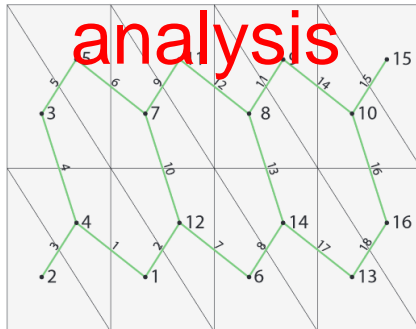
Numerical methods

Symbolic math

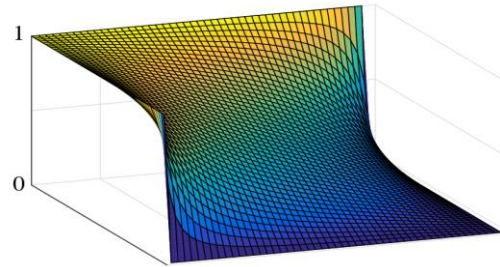
# Competition assignment

- selected assignments from previous semesters:

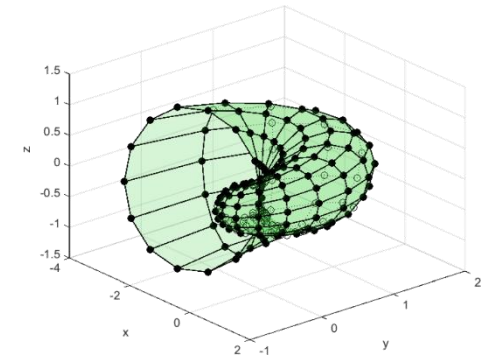
## Graph



## Jacobi method



## Effective plotting



- see <https://cw.fel.cvut.cz/wiki/courses/b0b17mtb/projects/soutez>
- project can be selected by any number of students
- conditions:
  - project is completed according the assignment → credit award
  - project is the best one → winning the competition
    - prizes for the first three winners

# B0B17MTB – Course syllabus

1	Introduction, information on the course, MATLAB workspace, basic arithmetic operators, basic functions
2	Complex numbers, complex matrix design, matrix operations, element-by-element operations, introduction to vectorization, matrix dimension
3	Indexing, data type and size, output format
4	MATLAB Editor, script design, relation and logical operators, cells
5	Cycles, cycles vs. vectorization, control flow, program branching
6	Visualization in MATLAB #1, debugging
7	Functions (main functions, subfunctions, nested functions, anonymous functions)
8	Struct, strings, 'eval' and 'feval' functions, MATLAB path
9	Visualization in MATLAB #2, GUI #1
10	GUI #2
11	Set operations, sorting, searching, user-defined functions #1
12	Date and time functions, error handling, I/O, basics of symbolic computations
13	Exercises, test
14	(Reserve)

# B0B17MTB – Deadlines

1	call for project proposals
2	
3	<i>bonus example (1-3 points)</i> , list of projects, discussion on own topics
4	
5	<i>short test (approx. 10-15 min) aimed on solving given problem in Matlab, 10 points</i>
6	<b>project choice</b>
7	<i>bonus example (1-3 points)</i>
8	
9	<i>short test (approx. 10-15 min) aimed on solving given problem in Matlab, 10 points</i>
10	<i>bonus example (1-3 points)</i>
11	
12	
13	<i>test (20 points), project hand-in (next-to-last week of the semester, 60 points), credit award</i>
14	reserve, competition assignment measurement

# Credit award

	Points	Min. points
Bonus example #1	2	10
Short test #1	10	
Bonus example #2	2	
Short test #2	10	
Bonus example #3	2	
Test	20	
Project	60	30

Grade	Points
A	90–100
B	80–89
C	70–79
D	60–69
E	50–59
F	0–49

# B0B17MTB – Schedule

- harmonogram of SS 2018/2019 (also on the web page):

	1. týden		2. týden		3. týden		4. týden		5. týden	
	18.II	20.II	25.II	27.II	04.III	06.III	11.III	13.III	18.III	20.III
	PO 16:15	ST 16:15	PO 16:15	ST 16:15	PO 16:15	ST 16:15	PO 16:15	ST 16:15	PO 16:15	ST 16:15
poznámka	MČ - mimo ČR		MČ - mimo ČR		MČ, VL, VA - mimo ČR		MČ, VL, VA - mimo ČR		MČ, VL, VA - mimo ČR	
master	Michal		Vít		Michal		Michal		Michal	
slave	Vít		Michal							
náplň	1 (úvod)		2 (matice)		3 (indexace)		4 (editor, relač. op.)		5 (cykly, větvení)	
harmonogram					bonusový příklad				1. písemka	

	6. týden		7. týden		8. týden		9. týden		10. týden	
	25.III	27.III	01.IV	03.IV	08.IV	10.IV	15.IV	17.IV	22.IV	24.IV
	PO 16:15	ST 16:15	PO 16:15	ST 16:15	PO 16:15	ST 16:15	PO 16:15	ST 16:15	PO 16:15	ST 16:15
poznámka	MČ, VL, VA - mimo ČR		MČ, VL, MM - mimo ČR						svátek	
master	Michal		Viktor		Viktor		Vít			
slave					Vít		Míla			
náplň	6 (vizual. 1)		7 (funkce)		8 (textové řetězce)		9 (vizual. 2, gui 1)			
harmonogram	zadání projektů		bonusový příklad				2. písemka			

	11. týden		12. týden		13. týden		14. týden		15. týden		soutěž	
	29.IV	01.V	06.V	08.V	13.V	15.V	20.V	22.V	27.V	29.V		
	PO 16:15	ST 16:15	PO 16:15	ST 16:15	PO 16:15	ST 16:15	PO 16:15	ST 16:15	PO 16:15	ST 16:15		
poznámka											bude doplněno (viz web)	
master	Míla		Míla		Míla		všichni					
slave	Viktor		Viktor		Vít							
náplň	10 (gui 2)		11 (množ. op.)		12 (bonusy)		13 (test, projekty)					
harmonogram	bonusový příklad						zápočet, projekty					

Náplň předmětu:

1 (úvod)	5 (cykly, větvení)	9 (vizual. 2, gui 1)	13 (test, proj.)				
2 (matice)	6 (vizual. 1)	10 (gui 2)	14 (rezerva)				
3 (indexace)	7 (funkce)	11 (množ. op.)					
4 (editor, relac. op.)	8 (textové řetězce)	12 (bonusy)					
zadání projektů	1. písemka	2. písemka	test	zápočet	soutěž	bonusový příklad	

Pozn.: bonusový příklad je za 1-3b a vybrán ze šedých příkladů (případně zcela mimo stajdy).  
 Pozn.: věcná část harmonogramu může být postupně mírně zpožděna



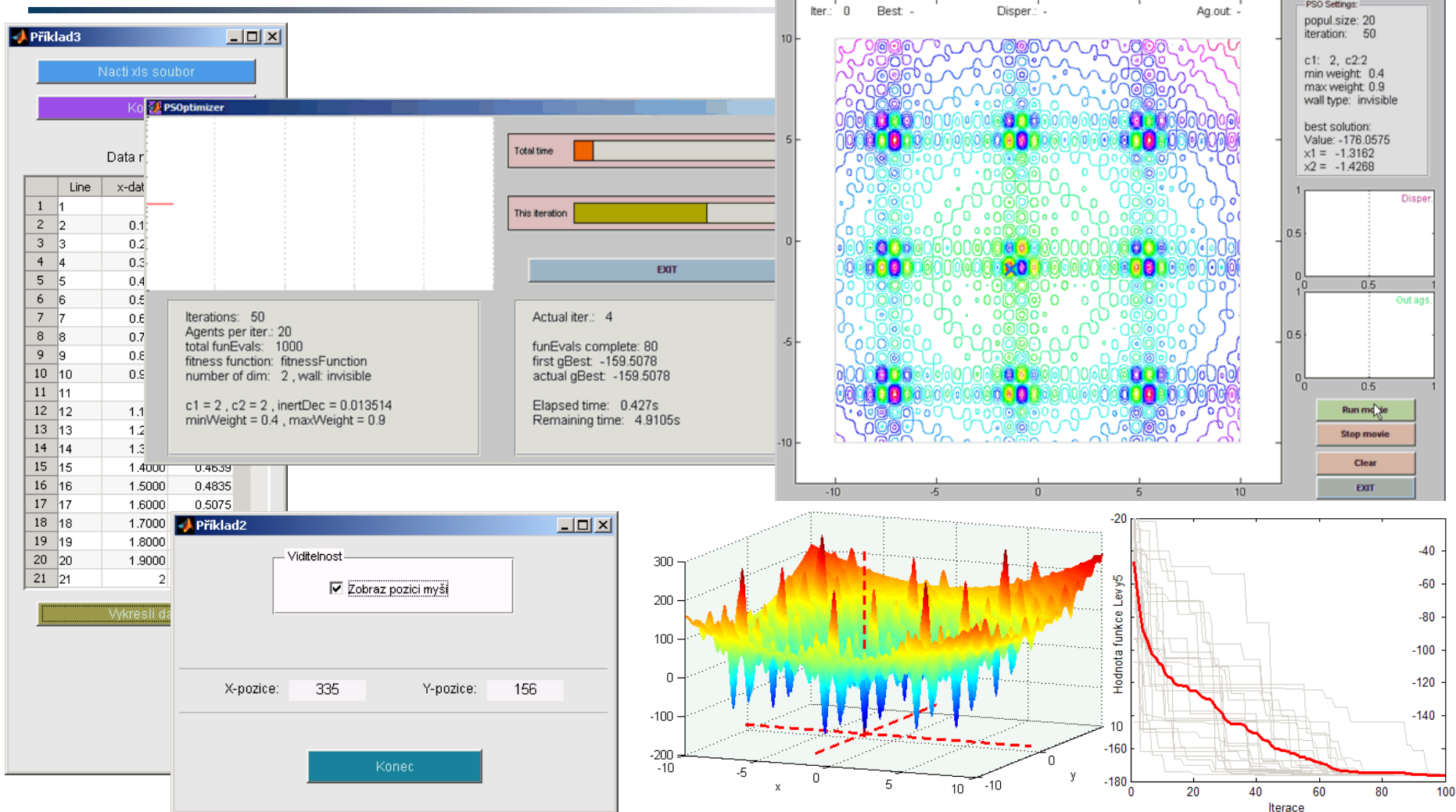
- this is how the bonus slides look like (see the background color...)

# B0B17MTB – Principles

- the aim of the course is to teach you something – if the presentation is to fast, be heard
- if you have an idea / proposal how to solve a problem in a more efficient way, put it forward
- can happen that the lecturer is not able to answer your question immediately, in that case the answer will be provided during the next lecture



# You will be able to ...



- see the [previous students' projects](#)

# Recommended literature, resources

- Matlab documentation

```
>> doc % opens the help browser
```

- Basic web-based textbooks on Matlab (so called primers)

- [www.mathworks.com/help/pdf\\_doc/matlab/getstart.pdf](http://www.mathworks.com/help/pdf_doc/matlab/getstart.pdf)
- <http://artax.karlin.mff.cuni.cz/~beda/cz/matlab/primercz/matlab-primer.html>

- Attaway, S.: Matlab – A Practical Introduction to Programming and Problem Solving, 3rd ed.

- available at Department's library

- Hahn, B. H., Valentine, D. T.: Essential Matlab, 5th Ed.

- available at Department's library

- other literature and sources will be mentioned during the semester...

# Thank you!



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