

1. Course title: DATA ANALYSIS AND VISUALIZATION IN MATLAB		2. Course code: WM2		
3. Validity of course description: 2019/2020				
4. Level of studies: 1st cycle of higher education				
5. Mode of studies: intramural studies				
6. Field of study: MATHEMATICS		(FACULTY SYMBOL) RMS		
7. Profile of studies: general				
8. Programme: all				
9. Semester: IV				
10. Faculty teaching the course: Faculty of Applied Mathematics				
11. Course instructor: professor Robertas Damaševičius				
12. Course classification: approved programme elective (monographic lecture)				
13. Course status: elective				
14. Language of instruction: English				
15. Pre-requisite qualifications: Programming, English.				
16. Course objectives: to understand the main principles of data visualization, to learn data analysis, visualization and processing using MATLAB (Octave) environment.				
17. Description of learning outcomes: A student who completes the course successfully should				
Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Able to analyze and categorical data in MATLAB	project	lecture, laboratory	K2A_W04 K2A_U13
2.	Able to analyze and visualize time series data in MATLAB	project	lecture, laboratory	K2A_W04 K2A_W06 K2A_U13 K2A_U14
3.	Able to analyze and visualize multidimensional (multivariate) time series data in MATLAB	project	lecture, laboratory	K2A_W07 K2A_U13
4.	Able to analyze and visualize network data in MATLAB	project	lecture, laboratory	K2A_U13 K2A_W05 K2A_W06
18. Teaching modes and hours Lecture / BA /MA Seminar / Class / Project / Laboratory Lecture 30h. Laboratory 30h.				
19. Syllabus description: <u>Lecture:</u> Core Concepts in Data Analysis: Summarization, Correlation, Visualization. Principles of effective visualization: visualization models and metaphors. Backgrounds of MATLAB : data types, functions, scripts. 2D graphics in MATLAB. 3D graphics in MATLAB. Methods and techniques for visualization of quantitative, ordinal, selective, and associative data. Animation in MATLAB. Fractal programming and visualization in Matlab. Audio and speech processing and visualization in MATLAB. Social network analytics and visualization. <u>Laboratories:</u> Practical approach to theory and examples presented at lectures.				
20. Examination: no				

21. Primary sources:

1. Holly Moore. MATLAB for Engineers. 3rd edition. Pearson Education Inc. 2012.
2. Amos Gilat. MATLAB: An Introduction with Applications. 4th Edition. Wiley, 2010.
3. Martin H. Trauth. MATLAB Recipes for Earth Science. Springer-Verlag, 2006.
4. Ian McLoughlin. Applied Speech and Audio Processing with MATLAB Examples. Cambridge University Press, 2009.

22. Secondary sources:

1. Magrab, Edward B. An engineers guide to MATLAB/ Edward B. Magrab. - Upper Saddle River : Prentice Hall, 2000. - 694 p.
2. Recktenwald, Gerald W. Numerical methods with MATLAB : implementations and applications/ Gerald W. Recktenwald. - Upper Saddle River : Prentice - Hall, 2000. - 786 p.
3. Jesper Schmidt Hansen. GNU Octave Beginner's Guide Kindle Edition. Packt Publishing (2011)
4. S. Attaway. Matlab: A Practical Introduction to Programming and Problem Solving 3rd Edition. Butterworth-Heinemann; 3rd edition (July 1, 2013).
5. L. Abell. Data Analytics with MATLAB: Data Processing, Exploration and Visualization. Createspace Independent Publishing, 2017.
6. S. Nagar Introduction to Octave: For Scientists and Engineers (Open Source Computing). 2016

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	30/10
2	Classes	/
3	Laboratory	30/20
4	Project	/30
5	BA/ MA Seminar	/
6	Other: consultations, use of e-learning webpage	/30
	Total number of hours	60/90

24. Total hours: 130**25. Number of ECTS credits:** 5**26. Number of ECTS credits allocated for contact hours:** 4**27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects):** 1**26. Comments:**

To pass, it is necessary to achieve all learning outcomes described above.

Approved:

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(date, Instructor's signature).....
(date, the Director of the Faculty Unit signature)