SYLLABUS

1. Information regarding the programme

1.1 Higher education institution	Babeș-Bolyai University Cluj-Napoca
1.2 Faculty	Faculty of Mathematics and Computer Science
1.3 Department	Department of Computer Science
1.4 Field of study	Computer Science
1.5 Study cycle	Master
1.6 Study programme / Qualification	Stiinta datelor in industrie si societate / Data Science for Industry and Society

2. Information regarding the discipline

2.1 Name of the discipline (en) (ro)	Data Toolkit Instrumente pentru gestiunea datelor				
2.2 Course coordinator	Lect. Dr. Șotropa Diana-Florina				
2.3 Seminar coordinator	Lect. Dr. Șotropa Diana-Florina				
2.4. Year of study I	2.5 Semester 1	2.6. Type of evaluation	C	2.7 Type of discipline	Compulsory
2.8 Code of the discipline	MME8179				

3. Total estimated time (hours/semester of didactic activities)

3.1 Hours per week	4	Of which: 3.2 course	2	3.3 seminar/laboratory	1 hour laboratory + 1 hour project
3.4 Total hours in the curriculum	56	Of which: 3.5 course	28	3.6 seminar/laboratory	28
Time allotment:					hours
Learning using manual, course support, bibliography, course notes					28
Additional documentation (in libraries, on electronic platforms, field documentation)					14
Preparation for seminars/labs, homework, papers, portfolios and essays					46
Tutorship					
Evaluations					6
Other activities:					

3.7 Total individual study hours	94
3.8 Total hours per semester	150
3.9 Number of ECTS credits	6

4. Prerequisites (if necessary)

4.1. curriculum	-
4.2. competencies	-

5. Conditions (if necessary)

5.1. for the course	• Class room with projector
5.2. for the seminar /lab activities	• Laboratory with computers

6. Specific competencies acquired

Professional competencies	• C2.3 Use of methodologies, specification mechanisms and development environments for the realization of computer applications • C2.5 Realization of dedicated IT projects • C6.3 Using techniques for installing, configuring and managing systems and networks.
Transversal competencies	• CT1 Application of efficient and rigorous working rules, manifest responsible attitudes towards the scientific and didactic fields, respecting professional and ethical principles. • CT2 Use of efficient methods and techniques for learning, information, research and development of abilities for knowledge exploitation, for adapting to the needs of a dynamic society and for communication in a widely used foreign language. • CT3 Use of efficient methods and techniques for learning, information, research and development of abilities for knowledge exploitation, for adapting to the needs of a dynamic society and for communication in a widely used foreign language.

7. Objectives of the discipline (outcome of the acquired competencies)

7.1 General objective of the discipline	• To introduce the basic concepts of versioning systems and information management systems
7.2 Specific objective of the discipline	• To present, install, and configure different development tools for programming, running, and troubleshooting Python programs locally or in the cloud • To introduce the basic concepts regarding the installation and configuration errors and incompatibilities • To introduce the basic concepts of project management through versioning systems

8. Content

8.1 Course	Teaching methods	Remarks
1. The evolution of the development cycle of a software product	• Interactive exposure • Explanation • Presentation • Practical examples • Case-study discussions	
2. Python installation and configuration (interpreter and libraries)		
3. Installation and configuration of Python development environments • Eclipse + PyDev IDE • Visual Studio Code • PyCharm		
4. Installation and configuration of Python development environments		

• Eclipse + PyDev IDE • Visual Studio Code • PyCharm		
5. Installation and configuration of Python development environments • Jupiter Notebook		
6. Installation and configuration of Python development environments • Google Colab Notebook		
7. Management of installation and configuration errors and incompatibilities		
8. Linux command line		
9. Version Control Systems: • Local systems • Centralized systems • Distributed systems		
10. Version Control Systems: • Our first repository • Saving and publishing the updates		
11. Version Control Systems: • Update of local information • Reverting to an earlier version		
12. Version Control Systems: • Development of secondary branches • Branching & merging two secondary branches		
13. Version Control Systems: • Conflict analysis Data version control systems		
14. Project demonstration and presentations		

Bibliography

The Python language reference. http://docs.python.org/py3k/reference/index.html
The Python standard library. http://docs.python.org/py3k/library/index.html
The Python tutorial. http://docs.python.org/tutorial/index.htm
PyCharm, the Python IDE for Professional Developers. https://www.jetbrains.com/pycharm/
Python in Visual Studio Code. https://code.visualstudio.com/docs/languages/python
Python in Visual Studio Technologies. https://visualstudio.microsoft.com/vs/features/python/
The Jupyter Notebook. https://jupyter-notebook.readthedocs.io/en/stable/
Google Colaboratory. https://colab.research.google.com/notebooks/intro.ipynb
Scott Chacon, Ben Straub, Pro Git Book, Apress, 2014. https://git-scm.com/book/en/v2
Data version Control. https://dvc.org/

8.2 Seminar / laboratory	Teaching methods	Remarks
The evolution of the development cycle of a software product Python installation and configuration (interpreter and libraries)	• Interactive exposure • Explanation • Practical examples • Case-study discussions	
Installation and configuration of Python development environments: • Eclipse + PyDev IDE • Visual Studio Code • PyCharm		
Installation and configuration of Python development		

environments • Jupiter Notebook • Google Colab Notebook Management of installation and configuration errors and incompatibilities		
Linux command line Version Control Systems: • Local systems • Centralized systems • Distributed systems • Our first repository • Saving and publishing the updates		
Version Control Systems: • Update of local information • Reverting to an earlier version • Development of secondary branches • Branching & merging two secondary branches		
Version Control Systems: • Conflict analysis Data version control systems		
Project demonstration and presentations		

Bibliography

The Python language reference. http://docs.python.org/py3k/reference/index.html
The Python standard library. http://docs.python.org/py3k/library/index.html
The Python tutorial. http://docs.python.org/tutorial/index.htm
PyCharm, the Python IDE for Professional Developers. https://www.jetbrains.com/pycharm/
Python in Visual Studio Code. https://code.visualstudio.com/docs/languages/python
Python in Visual Studio Technologies. https://visualstudio.microsoft.com/vs/features/python/
The Jupyter Notebook. https://jupyter-notebook.readthedocs.io/en/stable/
Google Colaboratory. https://colab.research.google.com/notebooks/intro.ipynb
Scott Chacon, Ben Straub, Pro Git Book, Apress, 2014. https://git-scm.com/book/en/v2
Data version Control. https://dvc.org/

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

• The results of the course are developing basic skills for a Data Science project. The student becomes familiarized with a wide range of tools used for data collection and manipulation • The course exists in the curriculum of many universities in the world • The course respects the IEEE and ACM curricula form Computer Science domain

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	Ability to put into practice the knowledge, techniques and methods taught in the course or seminar	Research report and presentation	50%
10.5 Seminar/lab activities		Project implementation and presentation	50%

10.6 Minimum performance standards: Final grade 5 (five)

Date   Signature of course coordinator   Signature of seminar coordinator

Lect. Dr. Șotropa Diana   Lect. Dr. Șotropa Diana

Date of approval   Signature of the head of department

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