syllabus

1. Information regarding the programme

1.1 Higher education institution	Babeş Bolyai University
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	Data Science

2. Information regarding the discipline

2.1 Name of the discipline (en) (ro)		Programming toolbox					
2.2 Course coordinator		Lect. Dr. Ioan Bădărînză					
2.3 Seminar coordinator		Lect. Dr. Ioan Bădărînză					
2.4. Year of study	**1**	2.5 Semester	**2**	2.6. Type of evaluation	**C**	2.7 Type of discipline	**Compulsory**
2.8 Code of the discipline	MME8184						

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

3.1 Hours per week	3	Of which: 3.2 course	2	3.3 seminar/ laboratory	1 lab + 1 proiect
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	36
Additional documentation (in libraries, on electronic platforms, field documentation)	35
Preparation for seminars/labs, homework, papers, portfolios and essays	40
Tutorship	4
Evaluations	4
Other activities:	

3.7 Total individual study hours	119
3.8 Total hours per semester	175
3.9 Number of ECTS credits	7

4. Prerequisites (if necessary)

4.1. curriculum	•
4.2. competencies	• Programming skills

5. Conditions (if necessary)

5.1. for the course	• Projector
5.2. for the seminar /lab activities	• Computers, Projector

6. Specific competencies acquired

Professional competencies	• **C3.3** Use of models and instruments from computer science and mathematica for solving problems specific to the application domain • **CE1.3** Using artificial intelligence methods, technics and algorithms to model solutions to different classes of problems • **CE1.5** Incorporation of models and solutions specific to artificial intelligence in dedicated applications
Transversal competencies	• **CT1.** Application of efficient work rules and responsible attitudes towards the scientific domain, for the creative exploitation of one's own potential according to the principles and rules of professional ethics • **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	• Introduction to the most popular tools available for viewing and analysing and applying artificial intelligence algorithms to solve certain problems
7.2 Specific objective of the discipline	• Installing and configuring the software required for the programming environment • Using various software programs for data analysis and visualization • Using intelligent algorithms and displaying results on a web page

8. Content

8.1 Course	Teaching methods	Remarks
Introduction (Course 1) - Software projects life cycle	Exposure Conversation Questioning Exercise	
Client – server architecture (Course 2 – 5) - Server-side Web technologies - Client-side Web technologies - Client – server integration		
Sklearn Presentation (Course 6 – 8) - Types of problems solved with Sklearn		
Weka Presentation (Course 9 – 11) - Types of problems solved with Weka		
SAS Platform Presentation (Course 12 – 14) - Administration and Architecture - Data analysis and visualization in the SAS platform - Smart features in the SAS platform		

Bibliography

1. Boian F. M. Programare distribuita în Internet; metode si aplicatii. Editura Albastra, MicroInformatica, Cluj, 2005

2. Negrino T., Smith D. JavaScript for the World Wide Web. 4th edition, Visual QuickStart Guide, 2001

3. W3Schools Tutoriale Web Online, http://www.w3schools.com

4. Invatare supervizata, https://scikit-learn.org/stable/supervised_learning.html#supervised-learning

5. Invatare supervizata, https://www.cs.waikato.ac.nz/~ml/weka/

6. Suport SAS, https://support.sas.com/

8.2 Seminar / laboratory	Teaching methods	Remarks
1. Install necessary tools (week 1)	Conversation Algorithmization Problematization Discovery Simulation Individual study Exercise	
2. Web server configuration (web 2)		
3. Web technologies: HTML, CSS, Javascript, Python (week 2 – 5)		
4. Installing and configuring Sklearn (week 6 - 8)		
5. Installing and configuring Weka (week 9 - 11)		
6. Installing and configuring the SAS platform (week 12 - 13)		
7. Project presentation (week 14)		

Bibliography

1. Boian F. M. Programare distribuita în Internet; metode si aplicatii. Editura Albastra, MicroInformatica, Cluj, 2005

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5. Invatare supervizata, https://www.cs.waikato.ac.nz/~ml/weka/

6. Suport SAS, https://support.sas.com/

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 course exists in the curriculum of many profile faculties around the world
- Software companies consider the course content to be useful in developing students' modelling and programming skills

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	- Knowledge of the basic concepts of the field - Applying the principles from the course content in solving problems	Project	50%
10.5 Seminar/lab activities	- Ability to understand and use the presented tools - Solving data visualization problems and using artificial intelligence algorithms	Systematic observation of the student during the task	10%
		Project	40%
10.6 Minimum performance standards			
• Each student has to demonstrate that they have understood how to install, configure and use the tools mentioned in the course and laboratory. Also, finding the right tool to solve problems. • To pass this discipline, the student has to obtain at least a grade of 5 per project.			

Date	Signature of course coordinator	Signature of seminar coordinator
.....	Lect. PhD Bădărînză Ioan	Lect. PhD Bădărînză Ioan

Date of approval	Signature of the head of department
.....	Prof. PhD. Dioșan Laura