FIŞA DISCIPLINEI

1. Program Information

1.1 Higher education institution	Transilvania University of Brașov
1.2 Faculty	Electrical Engineering and Computer Science
1.3 Department	
1.4 Field of Master's studies	
1.5 Study Cycle	Master's
1.6 Study program/Qualification	Internet Technologies in English

2. Course Information

2.1 Course title	Web Application Development II							
2.2 Course lecturer	assoc. prof. dr. eng. Dominic M. KRISTÁLY							
2.3 Laboratory lecturer	assoc. prof. dr. eng. Dominic M. KRISTÁLY							
2.4 Year of study	2	2.5 Semester	3	2.6 Evaluation type	E	2.7 Course regime	Content[3]	DCA
							Mandatory[3]	DO

3. Total Estimated Time (hours per semester of teaching activities)

3.1 Number of hours per week	**4**	3.2 lecture	**2**	3.3 seminar/laboratory/project	**0/2/0**
3.4 Total hours in the curriculum	56	3.5 lecture	28	3.6 seminar/laboratory/project	0/28/0
Student's activity time distribution					hours
Studying materials, course notes, bibliography					28
Additional research in libraries, online platforms, fieldwork					28
Preparing seminars/laboratories/projects, assignments, reports, portfolios, essays					56
Tutoring					5
Exams					2

3.7 Total student activity hours	119
3.8 Total hours per semester	175
3.9 Number of credits	7

4. Prerequisites (if applicable)

4.1 curriculum	-
4.2 competencies	-

5. Conditions (if applicable)

5.1 lecture	- blackboard - video projector
5.2 laboratory/project	- computer network - specialized software

6. **Specific competencies acquired (according to the competency grid in the curriculum)**

Professional Competencies	**CP. 1. Specification, design, and development of software systems using procedural languages, object-oriented languages, declarative languages, databases, methodologies, and development platforms** RÎ. 1.2. The graduate can situate a problem within a studied theoretical framework. RÎ. 1.3. The graduate can apply modern programming methods and techniques to solve a wide range of problems. RÎ. 1.4. The graduate can provide demonstrations and explanations regarding the validity of the claimed computational results. RÎ. 1.5. The graduate can apply IT methods and techniques to solve practical problems. RÎ. 1.7. The graduate can analyse algorithms that lead to solving practical problems. RÎ. 1.8. The graduate can perform quantitative evaluations of solutions using Data Mining. **CP. 3. Deepening methodologies and cutting-edge technologies used in the software industry or with clear prospects of being used in the near future** RÎ. 3.3. The graduate is capable of making interconnections between different IT fields. RÎ. 3.5. The graduate can situate a problem within a studied theoretical framework. RÎ. 3.6. The graduate can apply modern IT methods and techniques to solve a wide range of problems. **CP.4 Establishing data processes, managing data collection systems, developing data processing applications, implementing data quality processes, extracting information from data** RÎ. 4.2. The graduate develops and manages methods and strategies to maximize data quality and statistical efficiency in data collection, ensuring the collected data is optimized for subsequent processing. RÎ. 4.4. The graduate applies techniques for data analysis, validation, and quality verification to ensure data integrity. RÎ. 4.5. The graduate explores large datasets to reveal patterns using statistics, database systems, or artificial intelligence and presents the information in an easily understandable manner.
Transversal Competencies	**CT. 1. Communication and cooperation in professional contexts** RÎ. 1.2. The graduate uses communication and relationship techniques in the virtual environment. RÎ. 1.3. The graduate is capable of cooperating and integrating into professional work teams in the educational field and interdisciplinary teams. RÎ. 1.5. The graduate can deliver public presentations and communications to promote knowledge and professional values. **CT. 2. Career development and management** RÎ. 2.2. The graduate formulates objectives for career development and identifies strategies for action in this regard. RÎ. 2.3. The graduate self-evaluates and reflects on their own career, identifying strategies for adjustment and overcoming professional challenges.

7. Course objectives (derived from the specific competencies acquired)

7.1 General objective	• the course aims to provide students with comprehensive knowledge and skills for developing web applications using modern programming methodologies, frameworks, and tools. • the course focuses on fostering a deep understanding of software development principles, including SOLID programming and DevOps practices, to prepare students for industry challenges.
7.2 Specific objectives	• equip students with practical expertise in designing and managing microservices, securing web applications, and implementing reactive systems using advanced technologies like Spring Boot and Kafka. • students will gain proficiency in creating dynamic user interfaces with React and integrating data-driven approaches to solve complex IT problems, ensuring alignment with industry requirements and emerging trends.

8. Contents

8.1 Lecture	Teaching and learning methods	Hours	Comments
Internet infrastructure. Protocols and technologies for web applications (HTML, CSS, Javascript)	interactive presentation with a video projector	2	
Software project management with Maven. Dependency management with Maven.	traditional lecture explanation	2	

	Teaching and learning methods	Hours	Comments
Web project structure			
Architectures for web applications		2	
Development of microservices with the Spring Boot framework		4	
Using databases with Spring Data		2	
Securing web applications with Spring Security		2	
Reactive web applications with Spring Boot Reactive		4	
Event streams with Kafka		2	
Creating user interfaces in React		4	
SOLID programming principles		2	
DevOps concepts. Terraform. Docker. Kubernetes		2	

Bibliography
- https://www.baeldung.com/spring-boot
- https://spring.io/projects/spring-boot
- https://react.dev/

8.2 Laboratory	Teaching and learning methods	Hours	Comments
Basic web technologies	conversation	4	
Microservices with Spring Boot	exercises	8	
Reactive microservices with Spring Boot Reactive	problem-solving	6	
Asynchronous inter-service communication with Kafka		4	
User interfaces with React		6	

Bibliography
- https://www.baeldung.com/spring-boot
- https://spring.io/projects/spring-boot
- https://react.dev/

9. Correlation of course contents with the expectations of epistemic communities, professional associations, and representative employers in the field related to the program

The course, through its content offered to students, belongs to the field of information technology and has a practice-oriented approach to create the competencies required by the labour market.

10. Evaluation

Activity type	Evaluation criteria	Evaluation methods	Weight in the final grade
10.1 Course	Correctness of the solution provided	Practical test/presentation	90%
10.2 Laboratory	Completion of laboratories and presentation of obtained results	Ongoing evaluation during the semester	10%
10.3 Minimum performance standard			

- Attendance at all laboratory hours; absences are made up according to university regulations
- Passing the laboratory colloquium with a minimum grade of 5

This Course Sheet was approved in the Department Council meeting on 26/09/2024 and in the Faculty Council meeting on 26/09/2024.

Dean assoc. prof. dr. Ion Gabriel Stan	Department director assoc. prof. dr. Nicușor Minculete

assoc. prof. dr. eng. Dominic M. KRISTÁLY, Course lecturer	assoc. prof. dr. eng. Dominic M. KRISTÁLY, Laboratory lecturer

assoc. prof. dr. eng. Dominic M. KRISTÁLY,
Course lecturer

assoc. prof. dr. eng. Dominic M. KRISTÁLY,
Laboratory lecturer