COURSE OUTLINE

1. Data about the study program

1.1 Higher education institution	Universitatea Transilvania din Brașov
1.2 Faculty	Matematică și Informatică
1.3 Department	Matematică și Informatică
1.4 field of study [1)]	MA
1.5 Study level[2)]	MA
1.6 Study programme / Qualification	Internet Technologies

2. Data about the course

2.1 Name of the course				Web Application Development				
2.2 Course convenor				Lect. dr. Honorius Gâlmeanu				
2.3 Seminar/ laboratory / proiect convenor				Lect. dr. Honorius Gâlmeanu				
2.4 Study year	1	2.5 Semester	1	2.6 Evaluation type	E	2.7 Course status	Content[3)]	AC
							Attendance type[4)]	EC

3. Total estimated time (hours of teaching activities per semester)

3.1 Number of hours per week	4	Out of which: 3.2 lecture	2	3.3 seminar/ laboratory / project	2
3.4 Total number of hours în the curriculum	56	Out of which: 3.5 lecture	28	3.6 seminar/ laboratory / project	28

Time allocation	hours
Study of textbooks, course support, bibliography and notes	28
Additional documentation in libraries, specialized electronic platforms, and field research	28
Preparation of seminars/ laboratories/ projects, homework, papers, portfolios, and essays	54
Tutorial	24
Examinations	10
Other activities....................................	0

3.7 Total number of hours of student activity	144
3.8 Total number per semester	200
3.9 Number of credits[5)]	8

4. Prerequisites (where applicable)

4.1 curriculum-related	• Knowledge about an Java IDE (Integrated Development Environment); Maven (optional)
4.2 competences-related	• Knowledge about Java programming language, distributed computing fundamentals (sockets, messages, process and thread synchronization)

5. Conditions (where applicable)

5.1 for course development	• Projector and whiteboard
5.2 for seminar/ laboratory/ project development	• Workstations / laptops, at least 8 GB RAM, Intel i5 equivalent processor, capable of running Java SDK on Linux or Windows

6. Specific competences accumulated (according to study programme)

Professional competences	**P.C. 1. Specification, design and development of software systems using: procedural languages, object-oriented languages, declarative languages, databases, methodologies and development platforms.** L.O. 1.1. The graduate can use procedural languages, object-oriented languages, declarative languages in dealing with a theoretical and applied IT problem. L.O. 1.2. The graduate can frame a problem in a studied theoretical framework. L.O. 1.3. The graduate can apply modern programming methods and techniques to solving a wide range of problems. L.O. 1.4. The graduate can provide demonstrations and explanations regarding the validity of the stated IT results. L.O. 1.5. The graduate can apply computer methods and techniques to solve practical problems. L.O. 1.6. The graduate is able to operate, use and administer computer systems, computer networks, and database management systems. **P.C. 2. Analyzes network configuration and performance, uses specific application interfaces, database management systems, manages system security.** L.O. 2.3. The graduate can apply modern programming languages to manage databases. L.O. 2.4. The graduate can apply modern programming languages to manage computer networks. **P.C. 3. Deepening the latest methodologies and technologies used in the software industry or with clear prospects of being used soon.** L.O. 3.2. The graduate can convey well-organized computer knowledge to an auditory public. L.O. 3.6. The graduate can apply methods and techniques of modern computer science to solving a wide range of problems. **P.C. 4. Establish data processes, administer data collection systems, develop data processing applications, implement data quality processes, perform data mining.** L.O. 4.3 The graduate creates customized data processing software by selecting and using the appropriate computer programming language for an ICT system to produce required outputs based on expected inputs. L.O. 4.4 The graduate applies data quality analysis, validation and verification techniques to verify data quality integrity.
Transversal competences	**T.C. 1. Communication and cooperation in professional contexts** L.O. 1.3. The graduate can cooperate and integrate in professional work teams in the educational field and in interdisciplinary teams. L.O. 1.4. The graduate adapts his language and communication repertoire to the particularities of the interlocutors. **CT. 2. Career development and management** L.O. 2.1. The graduate documents himself and identifies opportunities for continuing professional training. L.O. 2.4. The graduate possesses strategies to regulate and control professional and personal stress. L.O. 2.5. The graduate knows and applies professional and personal time management techniques.

7. Course objectives (resulting from the specific competences to be acquired)

7.1 General course objective	• Learning design patterns specific to web development using Java Spring
7.2 Specific objective	• Usage of advanced Java language constructs that accelerate the design of web applications • Creation of the Rest API specific actions • Programming using Hibernate paradigm with Spring • Fundamentals of designin the user interface using AngularJS

8. Content

8.1 Course	Teaching methods	Number of hours	Remarks
Advanced Java Concepts	Presentation and free argument/comments	3	
Strings. File I/O. Serialization. Parsing and tokenization.	Presentation and free argument/comments	3	
Generics. Java Collections Framework	Presentation and free argument/comments	3	
Lambda Functions. Functional programming elements. Reflection. Annotations	Presentation and free argument/comments	3	
Threads and concurrency. Maven	Presentation and free argument/comments	3	
Java Spring. Dependency Injection	Presentation and free argument/comments	3	
Spring AOP. Aspect, advice, pointcut and join point	Presentation and free argument/comments	3	
Spring MVC. Hibernate	Presentation and free argument/comments	3	
Angular JS: Modules and Controllers	Presentation and free argument/comments	2	
AngularJS: Views. Templates. Promises. Forms and validation.	Presentation and free argument/comments	2	

Bibliography
[1] Kathy Sierra, Bert Bates, "SCJP Sun Certified Programmer for Java 6 Exam 310-065", McGraw-Hill, 2008
[2] "Methods of the Matcher class", Oracle Java Documentation, https://docs.oracle.com/javase/tutorial/essential/regex/matcher.html
[3] Jeanne Boyarsky, Scott Selikoff, "OCP Oracle Certified Professional Java SE 8 Programmer II Exam 1Z0-809", John Wiley & Sons, 2016
[4] Craig Walls, "Spring in Action", Manning Publications, 2015
[5] AngularJS Framework Fundamentals,https://courses.edx.org/courses/course-v1:Microsoft+DEV220x+4T2017/course/

8.2 Seminar/ laboratory/ project	Teaching-learning methods	Number of hours	Remarks
Autocloseable. Helper. Singleton. Factory	Individual work under supervision	3	
Immutable strings. Fișiere. Parsing. Strings	Individual work under supervision	3	
Java Collections Framework. Generic	Individual work under supervision	3	
Lambda functions. Functional interfaces. Reflection. Annotations.	Individual work under supervision	3	
Concurrency. Maven	Individual work under supervision	3	
Java Spring. Dependency Injection	Individual work under supervision	3	
Spring AOP	Individual work under supervision	3	
Spring MVC	Individual work under supervision	3	
AngularJS. Modules	Individual work under supervision	2	
AngularJS. Promises. Forms	Individual work under supervision	2	

Bibliography
[1] Andrey Redko, "Advanced Java Tutorial", https://www.javacodegeeks.com/2015/09/advanced-java.html
[2] "Search and replace with regular expressions", JavaMEX, http://www.javamex.com/tutorials/regular_expressions/search_replace_loop.shtml
[3] Jakob Jenkov, "Java Language Tutorial", http://tutorials.jenkov.com/java/index.html
[4] https://www.mkyong.com/maven/how-to-create-a-jar-file-with-maven
[5] https://maven.apache.org/guides/getting-started/

[6] Aspect Oriented Programming with Spring, http://docs.spring.io/spring/docs/current/spring-framework-reference/html/aop.html
[7] “Using HTTP Methods for RESTful Services”, http://www.restapitutorial.com/lessons/httpmethods.html
[8] Hibernate Community Documentation, Chapter 15. Batch processing, https://docs.jboss.org/hibernate/orm/3.6/reference/en-US/html/batch.html
[9] SQLite, Command Line Shell for SQLite, https://sqlite.org/cli.html
[10] Hibernate Hello World example using Maven build tool and SQLite database, http://www.srccodes.com/p/article/7/Annotation-based-Hibernate-Hello-World-example-using-Maven
[11] AngularJS API Docs, https://docs.angularjs.org/api
[12] Consuming a RESTful Web Service with AngularJS, https://spring.io/guides/gs/consuming-rest-angularjs

9. CCorrelation of course content with the demands of the labour market (epistemic communities, professional associations, potential employers in the field of study)

Employed technologies are representative for WEB applications development. The student is introduced the entire technologies stack, starting from backend, database design using Hibernate, REST API, application services up to front-end – dynamic design of the UI using JSP, jQuery and AngularJS.

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage în final grade
10.4 Course	Checking knowledge gain by solving problems	Quiz test	70%
10.5 Seminar/ laborator/ proiect	Writing code that solves the problem and satisfies imposed conditions	Present and defend homework	30%
10.6 Minimal performance standard			
• At least 70% of the concepts presented in the lecture are known; at least one code example is well understood.			

PThis course outline was certified in the Department Board meeting on 26/09/2024 and approved în the Faculty Board meeting on 26/09/2024

Conf. dr. Ion Gabriel Stan Dean	Conf. dr. Nicușor Minculete Head of Departament
Course holder lect. dr. Honorius GALMEANU	Holder of seminar/ laboratory/ project lect. dr. Honorius GALMEANU

Notes:

1) Field of study – select one of the following options: BA (bachelor) / MA (master) / PhD. (to be filled in according to the forceful classification list for study programmes);

2) Study level – choose from among: BA/MA/PhD;

3) Course status (content) – for the BA level, select one of the following options: FC (fundamental course) / DC (course in the study domain)/ SC (speciality

course)/ CC (complementary course); for the MA level, select one of the following options: PC (proficiency course) / SC (synthesis course) / AC (advanced course);

4) Course status (attendance type) – select one of the following options: CPC (compulsory course)/ EC (elective course)/ NCPC (non-compulsory course);

5) One credit is the equivalent of 25 study hours (teaching activities and individual study).