General information		
Course leader	**Aleksander Radovan, Senior lecturer**	
Course title	**Rapid Development of Java Applications Using Programming Frameworks**	
Study programme		
Course status	Elective	
Year	Year 1, semester 2	
Number of credits and mode of teaching delivery	ECTS student workload coefficient	5
	Number of hours (L+E+S)	60 (30 P + 30 V + 0 S)

COURSE DESCRIPTION

1.1. Course objectives

The aim of the course is to enable students to independently implement Java programming frameworks for the purpose of rapid application development. Students will learn the basic and advanced features of several of the most popular programming frameworks, which will enable them to create a variety of applications with an emphasis on web applications. The frameworks that are used are focused on database access and implement the object-relational mapping, on security settings of the web application, on model-view-controller architecture implementation, and unit testing of the web application components.

1.2. Conditions for enrolment in the course

No formal conditions. Student should be able to write programs comfortably in Java programming language.

1.3. Expected learning outcomes of the course

- **LO1 – Analyse advantages of using selected Java framework and implement a Java web application based on those advantages**
- **LO2 – Analyse advantages of using security Java framework and implement the security aspects to a Java web application**
- **LO3 – Integrate selected Java framework to establish connection with a database into an existing Java web application**
- **LO4 – Implement Java framework for object-relational mapping to database tables in an existing Java web application**
- **LO5 – Recognize advantages of using Java frameworks for implementing REST API interface on a Java web application and implementing those functionalities on an existing Java web application**
- **LO6 – Recommend and implement suitable Java libraries for writing unit tests, implementation of internationalization and creation of scheduled job on an existing Java web application**

1.4. Course content

Introduction to Java web applications
Introduction to Spring framework
Spring MVC
Spring Boot framework
Thymeleaf
Application scopes
Spring Security frameworks
Java web application and databases
Hibernate frameworks
Spring MVC REST services
Angular framework
Spring Data JPA
JUnit testing of Java web applications
Internationalization in Java web applications
Quartz scheduler

1.5. Teaching delivery modes:	☒ lectures ☐ seminars and workshops ☒ exercises ☐ remote learning ☐ field work	☒ independent work ☐ multimedia and network ☒ laboratory ☒ mentoring ☐ other _____
1.6. Comments		
1.7. Student obligations		

STUDENT ATTENDANCE

Class attendance is mandatory in the percentage prescribed by the Studies and examination regulations.

PASSING THE EXAM

The course has defined learning outcomes. In order for a student to pass the course, he/she must achieve a minimum of 50% of the points available for each learning outcome and collect a minimum of 50.01 points out of a possible 100 points per course.

1.8. Monitoring[1] student work

Class attendance		Activity during class		Seminar paper		Experimental work	
Written exam		Oral exam		Essay		Research	
Project	100%	Continuous assessment of knowledge		Student report		Practical work	

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[1] IMPORTANT NOTES: Next to each method of monitoring student work it is necessary to insert an adequate share of each activity in ECTS credits, so the total number of ECTS credits corresponds to the credit value of the course. You can use empty fields for additional activities.

Portfolio		Homework		Preparations for labs		

1.9.	*Assessment and evaluation of student work during classes and the final exam*

A grading system based is on a credit accumulation model combined with a defined sub-model, providing a model of the grading method and checking the satisfaction of learning outcomes used in this course.

CONCRETE REVIEW OF EVALUATION METHODS

The maximum number of points that a student can earn in a course is 100. Grades are calculated according to the following criteria table within which the distribution of passing grades in terms of the number of points is applied.

Points	Grade
0,00 - 50,00	(1) unsatisfactory
50,01 - 58,00	(2) sufficient
58,01 - 75,00	(3) good
75,01 - 92,00	(4) very good
92,01 - 100,00	(5) excellent

The method of accumulating points is determined in this course in accordance with the elements of scoring as follows:

Criterion	Maximum points
Project	100
TOTAL	100

The way of taking the colloquiums, the learning outcomes it covers, as well as the implementation of exams and remedial exams are defined by the "Instructions for attending and taking the course".

1.10.	*Required reading (at the moment of submitting the joint study programme report)*

- **Spring in Action, Fifth Edition, Manning, Craig Walls, 2018, ISBN: 978-1617294945**

1.11.	*Additional reading (at the moment of submitting the joint study programme report)*

- **Spring Boot in Action, Manning, Craig Walls, 2016, ISBN: 978-1617292545**
- **Spring Security in Action, Manning, Laurentiu Spilca, 2020, ISBN: 978-1617297731**
- **High-Performance Java Persistence, Vlad Mihalcea, 2016, ISBN: 978-9730228236**

• **Learning Angular: A no-nonsence beginner's guide to building web application with Angular 10 an TypeScript, Packt Publishing, Aristeidis Bampakos, 2020, ISBN: 978-1839210662** • **Junit in Action, Third Edition, Manning, 2020, Catalin Tudose, ISBN: 978-1617297045**	

1.12.   Number of copies of required reading in relation to the number of students who currently attend a course

Title	Number of copies	Number of students

1.13. Methods of quality monitoring that ensure the acquisition of knowledge, skills and competencies.

Monitoring the fulfilment of the desired learning outcomes is an important element of assessment because learning outcomes are the "guarantees" that the school gives to students, but also to employers and the wider community. Learning outcomes represent the minimum threshold that each student must achieve in order to pass the course. For a passing grade, the student must satisfy all the learning outcomes with the demonstrated knowledge, which corresponds to 50% of the points achieved for each learning outcome. The method of scoring based on learning outcomes is presented in the document "Instructions for attending and taking the course".