VIDZEMES AUGSTSKOLA

FACULTY OF ENGINEERING
STUDY COURSE DESCRIPTION

Course Title:	**Testing and its automation tools**				
Course code (LAIS):	*The course will be registered in the study administration system after accreditation*				
Study programme:	**Information technologies**				
Level of Study programme:	☐ 1st level professional higher education				
	☒ Professional Bachelor				
	☐ Professional Master				
	☐ Academic Master				
	☐ PhD level				
Type of Study programme:	☐ Compulsory course (Part A)				
	☐ Professional specialization courses (Part B, compulsory)				
	☐ Professional specialization optional courses (Part B, optional)				
	☐ Elective courses (Part C)				
Course Workload:	**Credits**	**ECTS**	**Academic hours**	**Contact hours**	**Independent work hours**
Full time	2	3	80	32	48
Part time	2	3	80	10	70
Course Author/ Tutor:	**Elīna Šiškeviča**				
	Guest lecturer Mg.sc.comp.				
	Elina.Siskevica@testdevlab.com				
	Consultation: according to the schedule for each semester				
Study Form:	Full time studies/ Part time studies				
Study year, semester:	2nd year 4th semester				
Language:	Latvian/English				
Prerequisites for the Course:	JAVA programming language				
Course Summary:	The course aim is to provide students knowledge about testing processes in software development to understand the practical implementation of testing using various testing methods and environments.				
Assessment:	Exam				
Requirements for Credits:	The final evaluation consists of: – 25% exam – 65% practical work to be done during studies (mobile application automation task, test case development, testing, REST API test case development, Web solution automation development) – 10% activity in lectures, practical work				
Abiding by the Academic Ethics	Students must abide by the academic and research ethics, Vidzeme University of Applied Sciences Ethics Regulations, incl.: – study papers must be independently developed; – the study work should reference all statements, ideas and data used that have been authored by someone else; – appropriate data acquisition methods should be used in the acquisition of data, the research ethics must be respected, empirical data must be collected independently and cannot be distorted or falsified; – the examination must be carried out by the student independently, without the use of supporting materials and/or consultations with other students, unless the lecturer states otherwise. In the event of non-compliance with the academic and research ethics, punishment is imposed in accordance with the ViA Ethics Regulations and the study course must be re-taken, unless the punishment is extramarital.				
Learning Outcomes; the evaluation methods and criteria	**Learning Outcomes**			**The evaluation methods and criteria**	
	Knowledge				
	Understanding of testing processes in software development			Exam	
	Understanding of the practical implementation of testing using different			Practical tasks	

	testing methods and environments	
	Skills	
	Student can define test cases in test management tools	Practical tasks
	Student can perform test planning and management	Practical tasks
	Student can understand testing methods	Practical tasks
	Student can use software testing tools	Practical tasks
	Student can demonstrate the ability to test web pages	Practical tasks
	Student can demonstrate the ability to perform testing on mobile devices	Practical tasks
	Student can demonstrate the ability to perform server (backend) testing	Practical tasks
	Student can understand and perform testing in software development (Agile) projects	Practical tasks
	Student can demonstrate the ability to perform security testing	Practical tasks
	Competency	
	Student can perform the practical implementation of testing qualitatively and independently, using various testing methods and environments	Practical tasks, activity in classes
Course Compulsory literature:	1. Abbas N., Gravell A. M., Wills G. B. Historical Roots of Agile Methods: Where did "Agile Thinking" come from? // Agile Processes in Software Engineering and Extreme Programming. – 2008. – pp. 94–103. 2. Dustin E., Rashka J., Paul J. Automated Software Testing: Introduction, Management and Performance. – Boston, MA, USA, 1999. – 608 p. 3. Kan S. H. Metrics and Models in Software Quality Engineering. 2nd ed. – Boston, MA, USA: Addison-Wesley, 2002. – 560 p. 4. Kaner C., Bach J., Pettichord B. Lessons Learned in Software Testing. – New York, NY, USA: Wiley, 2001. – 352 p.	
Course additional literature:		
Course confirmation date:	08.12.2022	
Date of course description update:		

Study Course Plan for Full Time Students:

Date	Theme	Academic hours		Study Form/ Organization of independent work of students and task description
		Contact hours	Independent work hours	
The date is specified before the implementation of the course	Introduction (Why testing is needed, industry standards, practical examples)	2	4	Lecture
	Teamwork - divide real web pages/applications, etc. between teams, and give some time to find the main problems. When the time has elapsed, gather a list of all of the issues and ask questions about what was needed to be considered/understood to start testing the	1	4	Practical task + ability to finish task at home

	solution/product, what kind of testing people did to find the problems.			
	Working with Test Management Xray or Testrail (basics). Aim = to get to the next topic - types of testing. Types of testing (black box, white box, functional, non-functional testing)	3	4	Lecture
	Test strategy development, Test planning and management	2	0	Lecture
	Practical task. * The task is to perform server-side testing of the application, where the tester has limited resources such as time, resources, available work resources, devices, etc. - how it will be planned, how it will be done (working in groups, each group offers their own vision, each group has different constraints - one time, another budget, another human resource, and others need to plan a server-side PATCH to the production environment, because the problem is already production) * Task is to develop a common testing concept (essentially, not a formal plan) with things to test when designing a mobile app + server app product	0	4	Practical task + ability to finish task at home
	Practical task. * Get known with the Jira project management tool, go through the lecturer's experience of how to define tasks, how to plan and close tasks, without forgetting how to test during the sprint and accept testing versions * Get known in-depth with the test management tool Xray or TestRail. Here will be the task to define system/application specific test examples in the tool. * Perform testing of an IT product, define reports for any found problems found in the Jira project management tool	0	6	Practical task + ability to finish task at home
	Testing in various development methodologies, in-depth insight into capabilities of development (Agile) methodology	4	2	Lecture / Practical task
	Lecture with examples White box testing - debugging, unit testing, integration testing.	2	2	Lecture with examples
	Website testing (tools used, technologies, types of testing)	1	2	Lecture
	Practical task. * Perform tests on any of the most	3	4	Practical task

	popular web pages using free web solution validators * Using the Selenium tool, develop a web automation task for the web solution www.testdevlab.com (the task consists of 2 parts - define test cases in the test management tool Testrail or Xray and automate them using the Selenium tool. About 5 test examples with 15 validations should be automated).			
	Mobile app testing (tools used, technologies, types of testing)	1	2	Lecture
	Practical task. * Android SDK must be installed on computers. Students are given a simple, ready-made android app product. As part of the practical work, some integration tests will be written for the JAVA android application. * Students are given a simple android app that does not contain much functionality. For this application, students have the task to develop automated tests using the Robotium framework (first to define, then to automate. Up to 5 test examples with 15 validations should be automated) * Show students a demonstration of how the Calaba.sh framework is used to set up a Continuous Integration solution for mobile device testing and development, ensuring that tests are started after a certain period of time or by a specific team (tools learned / familiar - Jenkins, Teamcity, Calaba.sh)	3	6	Practical task + ability to finish task at home
	Backend testing (tools used, technologies, types of testing) + practical task to perform REST API testing using JMeter and Apimation tools	2	6	Lecture / Practical task
	Security testing (Theory, necessity, practical examples and tasks)	2	2	Lecture / Practical task
	Preparation, consultation before the exam	8	16	
	Hours total:	***32***	***48***	

Study Course Plan for Part Time Students:

Date	**Theme**	**Academic hours**		**Study Form/ Organization of independent work of students and task description**
		Contact hours	**Independent work hours**	
The date is specified before the implementation of the course	Introduction (Why testing is needed, industry standards, practical examples)	1	5	Lecture

	Teamwork - divide real web pages/applications, etc. between teams, and give some time to find the main problems. When the time has elapsed, gather a list of all of the issues and ask questions about what was needed to be considered/understood to start testing the solution/product, what kind of testing people did to find the problems.	0	5	Independent work at home
	Working with Test Management Xray or Testrail (basics). Aim = to get to the next topic - types of testing. Types of testing (black box, white box, functional, non-functional testing)	1	4	Lecture
	Test strategy development, Test planning and management	1	2	Lecture
	Practical task. * The task is to perform server-side testing of the application, where the tester has limited resources such as time, resources, available work resources, devices, etc. - how it will be planned, how it will be done (working in groups, each group offers their own vision, each group has different constraints - one time, another budget, another human resource, and others need to plan a server-side PATCH to the production environment, because the problem is already production) * Task is to develop a common testing concept (essentially, not a formal plan) with things to test when designing a mobile app + server app product	0	3	Independent work at home
	Practical task. * Get known with the Jira project management tool, go through the lecturer's experience of how to define tasks, how to plan and close tasks, without forgetting how to test during the sprint and accept testing versions * Get known in-depth with the test management tool Xray or TestRail. Here will be the task to define system/application specific test examples in the tool. * Perform testing of an IT product, define reports for any found problems found in the Jira project management tool	0	6	Independent work at home
	Testing in various development methodologies, in-depth insight into capabilities of development (Agile)	1	4	Lecture

	methodology			
	Lecture with examples White box testing - debugging, unit testing, integration testing.	0	2	Lecture materials
	Website testing (tools used, technologies, types of testing)	0	3	Lecture materials
	Practical task. * Perform tests on any of the most popular web pages using free web solution validators * Using the Selenium tool, develop a web automation task for the web solution www.testdevlab.com (the task consists of 2 parts - define test cases in the test management tool Testrail or Xray and automate them using the Selenium tool. About 5 test examples with 15 validations should be automated).	0	4	Independent work at home
	Mobile app testing (tools used, technologies, types of testing)	1	2	Lecture
	Practical task. * Android SDK must be installed on computers. Students are given a simple, ready-made android app product. As part of the practical work, some integration tests will be written for the JAVA android application. * Students are given a simple android app that does not contain much functionality. For this application, students have the task to develop automated tests using the Robotium framework (first to define, then to automate. Up to 5 test examples with 15 validations should be automated) * Show students a demonstration of how the Calaba.sh framework is used to set up a Continuous Integration solution for mobile device testing and development, ensuring that tests are started after a certain period of time or by a specific team (tools learned / familiar - Jenkins, Teamcity, Calaba.sh)	0	6	Independent work at home
	Backend testing (tools used, technologies, types of testing) + practical task to perform REST API testing using JMeter and Apimation tools	0	6	Independent work at home
	Security testing (Theory, necessity, practical examples and tasks)	0	2	Independent work at home
	Preparation, consultation before the exam	8	16	
	Hours total:	***10***	***70***	