



COURSE UNIT DESCRIPTION

Course unit title	Course unit code
Software Systems Testing and Configuration Management	PSTV7134

Lecturer(s)	Department where the course unit is delivered
Coordinator: Andrius Adamonis Other lecturers: -	Department of Computer Science Faculty of Mathematics and Informatics Vilnius University

Cycle	Level of course unit	Type of the course unit
Second	-	Compulsory

Mode of delivery	Semester or period when the course unit is delivered	Language of instruction
Face-to-face	Autumn semester, second year of study	Lithuanian, English

Prerequisites and corequisites	
Prerequisites: Software testing methods, tools and process knowledge	Corequisites (if any): -

Number of ECTS credits allocated	Student's workload	Contact hours	Self-study hours
6	160	66	94

Purpose of the course unit: programme competences to be developed		
To increase knowledge of methods and tools of software testing and configuration management, to develop skills in evaluating and selecting appropriate software engineering, software testing and configuration management methods and tools in order to ensure quality of software development and deployment.		
Learning outcomes of the course unit: students will be able to	Teaching and learning methods	Assessment methods
Design the logical and technical architecture of software to ensure software testability and configuration manageability	Problem-oriented teaching, case studies, information retrieval, literary reading, individual work, tutorials, group project	Group project and results presentation, written exam (open-ended questions and tasks).
Evaluate methods and tools of software testing and configuration management and chose appropriate ones for the particular software development process		
Apply models of software quality evaluation and methods of quality assessment and maintenance.		
Clearly present the chosen software testing and configuration management topic, summarize it, argue and defend his/her own opinion.	Information retrieval, literary readings, report preparation and presentation at the seminar, group discussion	Presentation material, oral presentation, answers to oral questions

Course content: breakdown of the topics	Contact hours							Self-study work: time and assignments	
	Lectures	Tutorials	Seminars	Practice	Laboratory work	Practical training	Contact hours	Self-study hours	Assignments
1. Test paradigms and principles. Test levels, test methods and tools.	4						4	2	Self-preparation for the discussions at the seminars by self-study of suggested and self-discovered sources.
2. Test design and documentation.	2	1	1				4	4	
3. Defect classification (taxonomy). Defect tracking.	1		1				2	2	
4. Automated testing, automated testing tools.	3	1	4				8	6	
5. Testing process organization, testing process maturity, testing process assessment and improvement. Relationship of testing process and software process.	6						6	6	
6. Agile testing.	4						4	8	
7. Understanding of software configuration and configuration management, definitions. Configuration identification. Configuration status accounting.	2						2	2	
8. Configuration management process models. ITIL. Standard IEEE 282.	4						4	4	
9. Continuous integration principles and practices. DevOps method.	6		6				12	12	
10. Software process improvement by implementation of testing and continuous integration practices.		2					2	12	
11. Practical aspects of test automation.		2	6				8	14	Group project: a use-case of an application of automated testing, continuous integration and/or configuration management method and tool: given the scenario – software process of a sample software organization/team; the task is to investigate, select, and implement application of the methods and/or tools mentioned and the effect on the process being investigated. Present the solution at the seminar.
12. Practical aspects of continuous integration implementation.		2	6				8	14	
13. Preparation for the exam and taking the final exam (written)							2	8	Self-study of literature. (8 hours - preparation for exam, 2 hours – exam).
Total	32	8	24				66	94	

Assessment strategy	Weight, %	Deadline	Assessment criteria
Oral presentation	20	During the semester	<p>The following aspects of the presentation are assessed:</p> <ul style="list-style-type: none"> - The presentation structure, size and style: the structure is clear and logical, contains all necessary components (introduction, explanation, conclusions), the presentation is of a reasonable duration; the material was delivered for a preview. - Completeness, recommendations and conclusions: The material presented in detail and in comparison to others methods/tools, recommendations and conclusions are grounded – 1 point. <p>If the material is incomplete or the given conclusions are unreasonable – not more than 1 point.</p>
Group project	40	During the semester	<p>The assessment of the group project: Applicability of the methods and/or tools selected by the group, correctness of the selection criteria, extent of the positive effect on the process modeled in the use-case.</p> <ul style="list-style-type: none"> - 4 points: method or tool is implemented and demonstrated, valid description is prepared and submitted; - 3 points: method or tool is implemented and demonstrated, description is prepared, but with non-essential errors; - 2 points: major errors in the implementation or description is not prepared; - 1 point: only description/concept is prepared; - 0 points: project is not submitted.
Exam (written)	40	Exam session	<p>The exam consists of 3 open-ended questions and tasks of different complexity. One question verifies understanding of the concepts presented during lectures; other two questions require to apply knowledge acquired during the course in described practical situation or to compare several different practical methods discussed during lectures and seminars. Textbooks and computers are allowed during the exam. The assessment of the exam:</p> <ul style="list-style-type: none"> - 4 points: excellent knowledge and skills; comprehensive answer, concepts are used appropriately, concepts and terminology explained, argument given for suggestions and decisions in the answer; - 3 points: good knowledge and skills; proper arguments and proper concepts and terminology are used in the answers; - 2 points: average knowledge and skills; proper concepts and terminology are used and the right conclusions drawn, but the argument is not given; - 1 points: knowledge and skills are less than average; concepts are inconsistently, obvious errors in the answer; - 0 points: answer in not given.

Author	Year	Title	Number or volume	Publisher or URL
Required reading				
Ilene Burnstein	2002	Practical Software Testing		Springer
Keyes J.	2004	Software Configuration Management		Auerbach Publications
Humble J., Farley D.	2010	Continuous Delivery: Reliable Software Releases through Build, Test, and Deployment Automation		Addison-Wesley
	2007	ITIL 3 Lifecycle Publication Suite: Core Publications Collection		The Office of Government & Commerce
Recommended reading				
Whittaker J. A.	2012	How Google Tests Software		

Hutcheson M. L.	2003	Software Testing Fundamentals: Methods and Metrics		John Wiley & Sons
Crispin L.	2009	Agile Testing: A Practical Guide for Testers and Agile Teams		Addison-Wesley
Patton R.	2005	Software Testing		Sams Publishing
Copeland L.	2004	A Practitioner's Guide to Software Test Design		Artech House
Duvall P. M., et al.	2007	Continuous Integration: Improving Software Quality and Reducing Risk		Addison-Wesley
Berczuk S. P. et al.	2003	Software Configuration Management Patterns: Effective Teamwork, Practical Integration		Addison-Wesley
	1990	IEEE 282 Standard for Software Configuration Managements Plans		IEEE