

**RTU Course "Software Engineering"**

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General data

Code	DIP383
Course title	Software Engineering
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Academic
Field of study	Computer Science
Responsible instructor	Larisa Zaiceva
Academic staff	Sabina Kataļņikova Oksana Zavjalova
Volume of the course: parts and credits points	1 part, 2.0 Credit Points, 3.0 ECTS credits
Language of instruction	LV, EN
Annotation	Software life-cycle. Software development paradigms. Requirement analysis and definitions. Software specification. Software design. Evaluation of design quality. User interface. Verification and validation. Testing goal and methods. Testing process: testing of modules, testing of systems, testing strategies. Software maintenance.
Goals and objectives of the course in terms of competences and skills	The aim of the course is to present to students models and methods of software engineering, as well as to teach them how to develop and document software systems using models and methods. Objectives of the course: 1) to view software life-cycle by analyzing goals and objectives of each stage of the cycle; 2) to analyze software development models: software classes, techniques, advantages and disadvantages; 3) to train students to practically use obtained knowledge in software system development.
Structure and tasks of independent studies	Student should fulfil four laboratory works: 1) software specification; 2) software design; 3) software implementation; 4) program testing.
Recommended literature	1.Zaiceva L. Programmatūras izstrādes tehnoloģija. – 2. izd. – Rīga : RTU, 2002. – 244 lpp. 2.Sommerville I. Software Engineering. – 9th Edition. – Addison-Wesley Pub. Comp, 2010. – 792 p. 3.Van Vliet H. Software Engineering. Principles and Practice. – John Wiley & Sons, 2008. – 740 p. 4.Pfleeger S.L., Atlee J.M. Software Engineering: Theory and Practice. – 4th Edition. – PRENTICE HALL, 2010. – 792 p. 5.Bell D. Software Engineering for Students. – Pearson Education (US), 2005. – 448 p. 6.McCaffrey J.D. Software Testing: Fundamental Principles and Essential Knowledge. – BookSurge Publishing, 2009. – 118 p. 7.Dustin E., Rashka J., Paul J. Automated Software Testing. Introduction, management and performance. - Addison-Wesley Pub. Comp, 1999. - 575 p. 8.Pigoski T.M. Practical Software maintenance. – Wiley Comp. Pub., 1997. – 384 p. 9.Гагарина Л.Г., Кокорева Е.И., Виснадул Б.Д. Технология разработки программного обеспечения : учебное пособие. – М.: ИД «ФОРУМ»: ИНФРА-М, 2008. – 400 с.
Course prerequisites	According to the 3rd study year of Bachelor programme

Course outline

Theme	Hours
Software engineering concepts. Software classification. Software life-cycle. Software development models.	2
Requirement definition, specification and documentation. Functional and non-functional requirements.	4
Software design process, stages and methods.	4
Data structure and user interface design. Design Quality criteria. Estimation of user interface.	4
Software implementation methods. Program debugging.	6
Verification and validation: goals and techniques. Static verification. Black-box testing methods.	6
White-box testing methods. Software testing documentation.	4
Software maintenance process. Personal characteristics of a programmer.	2

Learning outcomes and assessment

Learning outcomes	Assessment methods
Knows software development stages and models, tasks, deliveries and documents of each stage.	Positive assessment of final examination.
Is able to develop system model, define and specify requirements, as well as to prepare requirement document.	Positive assessment of fulfilled 1st laboratory work.
Is able to design software system and to describe results according to Latvian state standards.	Positive assessment of fulfilled 2nd laboratory work.
Is able to select technology and to implement software system, as well as to prepare user guide.	Positive assessment of fulfilled 3rd laboratory work.

Is able to develop test cases and to test a program using Black-box and White-box testing methods.	Positive assessment of fulfilled 4th laboratory work.
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Study subject structure

Part	CP	Hours per Week			Tests		
		Lectures	Practical	Lab.	Test	Exam	Work
1.	2.0	1.0	0.0	1.0		*	