



## SYLLABUS

<b>Basic information of the course</b>	
<b>University:</b>	<b>University “Ukshin Hoti” - Prizren</b>
<b>Academic unit:</b>	<b>Faculty of Computer Science</b>
<b>Study program:</b>	<b>Information and Telecommunication Technologies</b>
<b>Course:</b>	<b>Software Engineering</b>
<b>Study level:</b>	<b>Bachelor</b>
<b>Course status:</b>	<b>Mandatory</b>
<b>Study year:</b>	<b>2</b>
<b>Number of hours per week:</b>	<b>2+2</b>
<b>Credit value - ECTS:</b>	<b>6</b>
<b>Time / location:</b>	<b>It will be published in the university web site!</b>
<b>Lecturers:</b>	<b>Ass. Fesal Baxhaku, Ph. D. c. Ass. Arbër Beshiri, Ph. D. c.</b>
<b>Contact details:</b>	<b>fbaxhaku@gmail.com arber.beshiri@uni-prizren.com</b>
<b>Course description:</b>	This course covers the basic concepts of software engineering. Topics include software processes, software models, phases of software development, software project management, testing, and safety mechanisms.
<b>Course objectives:</b>	The main purpose of this course is to know and apply the design patterns, object-oriented methodologies, software requirements specification, testing plan, code inspection, software management, and configuration. The goals of this course include the design of object-oriented applications using UML, the analysis of software safety, tools for designing, testing, and software project management. One of the most important steps before developing complex systems is the efficient analysis and documentation of the system specifications. This course will let them know the steps and actions that need to be taken to develop cost-effective and high quality software systems.
<b>Learning outcomes:</b>	Upon completion of this course the student will be

	<p>able to:</p> <ul style="list-style-type: none"> <li>- To have basic knowledge of software processes.</li> <li>- To have basic knowledge of the software process models.</li> <li>- To be able to apply different software models.</li> <li>- To be able to use modern software tools for software engineering and practicing software techniques.</li> <li>- To use the methods of each phase of software development.</li> <li>- To have basic knowledge of the cost of software system development in practice.</li> <li>- To be able to make software project management.</li> <li>- To be able to test and create safety mechanisms for developed software.</li> </ul>
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**Contribution on student load (must correspond with learning outcomes)**

Activity	Hours	Days/week	Total/hours
Lectures	2	15	30
Exercise theoretical/laboratory	2	15	30
Practice work	1	2	2
Contact with lecturer/consultations	1	15	15
Field exercises	-	-	-
Midterms	2	2	4
Laboratory exercises	2	1	2
Individual time spent studying (at the library or home)	3	15	45
Final preparation for the exam	3	5	15
Time spent in evaluation (tests, quiz, final exam)	2	3	6
Projects, presentations, etc.	1	1	1
<b>Total</b>			<b>150</b>

Notice: 1 ECTS credits = 25 hours commitment, e.g. if the course has 6 ECTS credits student must have 150 hours during the semester.

<b>Teaching methods:</b>	The course is a combination of lectures, discussions, numerical and laboratory exercises, while the assignments are presented by the laboratory course lecturers!
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<b>Assessment methods:</b>	<ul style="list-style-type: none"> <li>- Laboratory exercises: 50%.</li> <li>- Final exam: 50%.</li> <li>- Or final exam: 100%.</li> </ul>
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Assessment and grading:	Vlerësimi në %	Nota përfundimtare
	91% - 100%	10
	81% - 90%	9
	71% - 80%	8
	61% - 70%	7
	51% - 60%	6
	0% - 50%	5
Literature		
<b>Basic literature:</b>	<ol style="list-style-type: none"> <li>1. Ian Sommerville. Software Engineering, 10th edition, Pearson Education Limited, 2016.</li> <li>2. Alan Dennis, Barbara Haley Wixom and David Tegarden. System Analysis and Design - An Object Oriented Approach with UML, 5th edition, John Wiley &amp; Sons, Inc., 2015.</li> </ol>	
<b>Additional literature:</b>	<ol style="list-style-type: none"> <li>1. Rod Stephens, Beginning Software Engineering 1st edition, John Wiley &amp; Sons, Inc., 2015.</li> <li>2. Perdita Stevens. Using UML Software Engineering with Objects and Components, 2nd edition, Addison Wesley &amp; Pearson Education Limited, 2006.</li> </ol>	
Study plan		
Week	Lectures	
<i>First week:</i>	<ul style="list-style-type: none"> <li>• Introduction to course organization – syllabus</li> <li>• Introduction to Software Engineering (chapter 1)</li> </ul>	
<i>Second week:</i>	<ul style="list-style-type: none"> <li>• Software processes – software process models, process activities, Rational Undefined Process (RUP) (chapter 2)</li> </ul>	
<i>Third week:</i>	<ul style="list-style-type: none"> <li>• Agile software development (chapter 3)</li> </ul>	
<i>Fourth week:</i>	<ul style="list-style-type: none"> <li>• Requirements engineering - functional and non-functional requirements.</li> <li>• User requirements, system requirements, interface specification, feasibility study, requirements analysis and validation (chapter 4)</li> </ul>	
<i>Fifth week:</i>	<ul style="list-style-type: none"> <li>• System modeling (chapter 5)</li> </ul>	
<i>Sixth week:</i>	<ul style="list-style-type: none"> <li>• Architectural design – decisions, views, patterns (chapter 6)</li> </ul>	
<i>Seventh week:</i>	<ul style="list-style-type: none"> <li>• Design and implementation (chapter 7)</li> </ul>	
<i>Eighth week:</i>	<ul style="list-style-type: none"> <li>• Software testing (chapter 8)</li> </ul>	
<i>Ninth week:</i>	<ul style="list-style-type: none"> <li>• Software evaluation (chapter 9)</li> <li>• Software management – project management (chapter 22) and project planning (chapter 23)</li> </ul>	

<b><i>Tenth week:</i></b>	<ul style="list-style-type: none"> <li>• Software management – project management (chapter 22) and project planning (chapter 23)</li> <li>• Dependable systems (chapter 10)</li> </ul>
<b><i>Eleventh week:</i></b>	<ul style="list-style-type: none"> <li>• Reliability engineering (chapter 11)</li> </ul>
<b><i>Twelfth week:</i></b>	<ul style="list-style-type: none"> <li>• Safety engineering (chapter 12)</li> </ul>
<b><i>Thirteenth week:</i></b>	<ul style="list-style-type: none"> <li>• Security engineering (chapter 13)</li> </ul>
<b><i>Fourteenth week:</i></b>	<ul style="list-style-type: none"> <li>• Resilience engineering – cybersecurity, sociotechnical resilience, resilient systems designs (chapter 14)</li> </ul>
<b><i>Fifteenth week:</i></b>	<ul style="list-style-type: none"> <li>• Final exam</li> </ul>

### Exercises

<b>Study plan</b>	
<b>Java</b>	<b>Exercises</b>
<b><i>First week:</i></b>	<ul style="list-style-type: none"> <li>• Introduction to course organization – syllabus</li> <li>• Introduction to Software Engineering</li> </ul>
<b><i>Second week:</i></b>	<ul style="list-style-type: none"> <li>• Waterfall model</li> <li>• Specification and development of software processes</li> </ul>
<b><i>Third week:</i></b>	<ul style="list-style-type: none"> <li>• Agile model: methods and techniques of software project management</li> </ul>
<b><i>Fourth week:</i></b>	<ul style="list-style-type: none"> <li>• Requirements engineering - functional and non-functional requirements.</li> <li>• User requirements, system requirements, interface specification, feasibility study, requirements analysis and validation</li> </ul>
<b><i>Fifth week:</i></b>	<ul style="list-style-type: none"> <li>• Presentation of UML diagram tools</li> <li>• UML diagrams and use case</li> </ul>
<b><i>Sixth week:</i></b>	<ul style="list-style-type: none"> <li>• Architectural design – decisions, views, patterns</li> <li>• Sequential diagrams</li> </ul>
<b><i>Seventh week:</i></b>	<ul style="list-style-type: none"> <li>• Object oriented design using UML</li> <li>• Class diagrams and object diagrams</li> <li>• Design patterns and prototypes</li> <li>• Designing the user interface</li> </ul>
<b><i>Eighth week:</i></b>	<ul style="list-style-type: none"> <li>• Software implementation</li> <li>• Software testing</li> <li>• Software testing tools</li> </ul>
<b><i>Ninth week:</i></b>	<ul style="list-style-type: none"> <li>• Software evaluation</li> <li>• Project management – managerial activities, project planning, timing activities, risk management, version planning, version management and software tools of project management</li> </ul>
<b><i>Tenth week:</i></b>	<ul style="list-style-type: none"> <li>• Software evaluation</li> <li>• Project management – managerial activities, project</li> </ul>

	<p>planning, timing activities, risk management, version planning, version management and software tools of project management</p> <ul style="list-style-type: none"> <li>• Dependable systems</li> </ul>
<i>Eleventh week:</i>	<ul style="list-style-type: none"> <li>• Dependable systems</li> <li>• Reliability engineering</li> </ul>
<i>Twelfth week:</i>	<ul style="list-style-type: none"> <li>• Safety engineering</li> </ul>
<i>Thirteenth week:</i>	<ul style="list-style-type: none"> <li>• Security engineering</li> </ul>
<i>Fourteenth week:</i>	<ul style="list-style-type: none"> <li>• Resilience engineering – cybersecurity, sociotechnical resilience, resilient systems designs</li> </ul>
<i>Fifteenth week:</i>	<ul style="list-style-type: none"> <li>• Exercises about final exam</li> </ul>

<b>Academic policies and rules of conduct</b>	
	<ul style="list-style-type: none"> <li>• Generally lecture presentations will be made through MS PowerPoint, tables, material usage, computer programs and numeric exercises.</li> <li>• Additional resources (scientific papers, publications, national bulletins, as well as recent discoveries and research) will be provided by professors.</li> <li>• In the absence of the opportunity for practical work to be organized weekly, in cooperation with the management of the university, this activity will be organized on certain days in: organizations, companies, etc.</li> <li>• During each session will be organized the conversation and co-participation with the students!</li> <li>• Students are required to be regular in lectures and exercises!</li> <li>• It will be evaluated when the students collaborate and participate in the lectures and course exercises!</li> <li>• Timely arrival in lectures and exercises is mandatory!</li> </ul>