1.	Course title	Software Architecture and Design
2.	Course code	CSEW511
3.	Study program	
4.	Unit offering the course	**FCSE**
5.	Undergraduate/postgraduate/PhD	**Undergraduate**
6.	Year/semester	7. ECTS: **6**
8.	Teacher(s)	assoc. prof. dr. Dejan Gjorgjevikj, assoc. prof. dr. Ljupcho Antovski, assoc. prof. dr. Slobodan Kalajdzhiski, assist. prof. dr. Nevena Ackovska, assist. prof. dr. Ivan Chorbev, assist. prof. dr. Gjorgji Madzarov
9.	Course prerequisites	Object oriented programming
10.	Goals (competences): Students should learn the main concepts of the object oriented analysis and design. To introduce the students to the techniques of refactoring, design patterns and different software architectures. Upon completion of the course the students will be able to identify the restrictions and assess the quality of the software systems. They will be able to evaluate completeness and consistency of software specifications, and to design software architectures according the specific needs.	
11.	Course content: Construction of physical model of software components, design principles (correctness, robustness, flexibility, reusability and effectiveness). Advanced software design, refactoring, design patterns (creating design patterns, structural design patterns, and behavioural design patterns). Object – oriented analysis and design, component based design. Features of good design: performances, security, reliability, reusability, etc. Measurement of internal features of the software and complexity of the software.	
12.	Teaching methods: Lectures supported by presentations with slides, interactive lectures, exercises (use of equipment and software packages), real life examples, invited guest lecturers, preparation and defence of a project work and seminar thesis, self-study, learning in an e-environment (forums, consultations).	
13.	Total available time	6 ECTS x 30 hours = 180 hours
14.	Distribution of the available time	30 + 60 + 50 + 40 = 180

15.	Teaching activities	15.1.	Lectures	30 hours
		15.2.	Training (labs, problem solving), seminar and team work	60 hours
16.	Other activities	16.1.	Home work	50 hours
		16.2.	Self study	40 hours

17.	Grading		
	17.1.	Tests	50 points
	17.2.	Seminar work/project (written or oral presentation)	20 points

	17.3.	Homework			20 points
	17.4.	Active participation			10 points
18.	Grading criteria		to 50 points		5 (five) (F)
			from 51 to 60 points		6 (six) (E)
			from 61 to 70 points		7 (seven) (D)
			from 71 to 80 points		8 (eight) (C)
			from 81 to 90 points		9 (nine) (B)
			from 91 to 100 points		10 (ten) (A)
19.	Final exam prerequisites		Completed activities 15 and 16		
20.	Course language		Macedonian and English		
21.	Quality assurance methods		Internal evaluation mechanisms supported by student polls		

22.		Literature				
		Compulsory				
	22.1.	No.	Authors	Title	Publisher	Year
		1.	Brett D. McLaughlin, Gary Pollice, Dave West	Head First Object-Oriented Analysis and Design	O'Reilly	2006
		2.	Eric Freeman, Elisabeth Robson, Bert Bates and Kathy Sierra	Head First Design Patterns	O'Reilly Media	2004
		3.	Robert C. Martin	Agile Software Development, Principles, Patterns, and Practices	Prentice Hall	2003
	22.2.	Additional				
		No.	Authors	Title	Publisher	Year
		1.	David Budgen	Software Design 2nd edition	Pearson	2003
		2.	Microsoft Patterns & Practices Team	Application Architecture Guide, 2nd Edition (Patterns & Practices)	Microsoft corporation	2009
		3.	Eric J. Braude	Software Design: From Programming to Architecture	Boston University Press	2003