1.	Course	**Advanced computational methods**			
2.	Code	**INF-S15**			
3.	Study programme	Informatics			
4.	Study programme organized by	Faulty of Computer Science and Engineering			
5.	Cycle	Third - PhD			
6.	Academic year / semester winter/summer/elective	first/second	7.	ECTS credits	7,5
8.	Teacher	Prof. D-r Anastas Mishev, Prof. D-r Boro Jakimovski, Prof. D-r Margita Kon-Popovska			
9.	Prerequisites	None			

10.	Course programme goals (competences):
	The goal of the course is to introduce the students to the concepts of scientific programming, applications of the current computing architectures and platforms (grid, HPC) in science and engineering, advanced numerical algorithms.

11.	Course syllabus: The concept of scientific programming. Advanced numerical methods. Open issues in computing by model reduction, flow simulation, propagation, particles. Monte Carlo algorithms, applications and parallelization. Implementation and parallelization of frequency and time signal analysis. Implementation of fast HPC algorithms.

12.	Teaching methods:
	Classes supported with slide presentations, interactive teaching, lab equipment and other software packages, teamwork, case studies, invited guest lecturers, presentations of project works, e-learning materials, forums and consultations

13.	Total fund of work hours		7,5 EKTC x 30 h = 225 h	
14.	Available hours distribution		45+30+150 = 225	
15.	Teaching activities	15.1.	Theoretical classes	45 h
		15.2.	Practical classes (labs, exercises), seminars, team work	30 h
16.	Other activities	16.1.	Project tasks	50 h
		16.2.	Self study	50 h
		16.3.	Homework	50 h

17.	Grading		
	17.1.	Tests	40 points
	17.2.	Seminar work/ project (presentation: written and oral)	50 points
	17.3.	Active participation	10 points
18.	Grading criteria (points/grade)	to 59 points	5 (five) (F)
		from 60 to 68 points	6 (six) (E)

		from 69 to 76 points	7 (seven) (D)
		from 77 to 84 points	8 (eight) (C)
		from 85 to 92 points	9 (nine) (B)
		from 93 to 100 points	10 (ten) (A)
19.	Conditions for attending the final exam	Successful completion of activities 15.1 and 15.2	
20.	Language	Macedonian or English	
21.	Quality assessment	Internal evaluation and student pools	

22.	Literature					
		Compulsory				
	22.1.	No.	Author	Title	Publisher	Year
		1.	Barry Koren, Kees Vuik (Eds.)	Advanced Computational Methods in Science and Engineering	Springer	2010
		2.				
		3.				
		Additional				
	22.2.	No.	Author	Title	Publisher	Year
		1.		Relevant and up-to-date paper from the area		
		2.				
		3.				