Course Code	Course Type	Regular Semester	Lecture (hours/we	Seminar (hours/we	Lab. (hours/we	Credits	ECTS		
			ek)	ek)	ek)				
EMS 220	В	Spring	3.00	1.00	0.00	3.50	5.00		
	Lecturer								
	Assistant								
Course language									
Course level									
Description		The purpose of this course is to provide an introduction to the design and analys of efficient graphs and algorithms.							
	 Understand the design, analysis and implementation of graphs and algorit Be familiar with standard symbol manipulations that arise in algorithm des Understand how to calculate the efficiency of implementing specific operal and Understand implementation of algorithms and data structure in a moder programming language like Java / Python Enhance programming skills through the proficient use of newly learned algorithms and data structures. Present of work and results in a convincing way. 						m design operation nodern s through		
Core Concepts		This course is an introduction to the design and analysis of efficient data structures. Topics include lists, stacks, queues, priority queues, trees, graphs, and their associated algorithms, sorting, searching and hashing techniques; time and space complexity.							
Course Outlin Week	ne la			Tonic					
1	Intro to Cour	se, Analysis of Alg		Topic	ations				
2									
3		Abstract data types							
4		nked Lists, Stacks and Queues ees, Binary Trees							
5	-								
6	Tree Traversa	Binary Search Trees							
7	Balanced Search Trees								
8	MIDTERM EXAM								
9	Sorting: Merge Sort, Heap Sort								
10	Sorting: Quick Sort, Bucket Sort								
11	Mapping, Hashing Tables								
12	Graph Data Structure								
13	Prim`s Algorithm, Kruskal`s Algorithm, Dijkstra Algorithm								
14	Project Presentation								
	Review								
15	Review								

Prerequisites Literature		The student must attend the course at a minimum rate of 75%.				
		• Robert Sedgewick and Kevin Wayne, Algorithms, 4th Edition, Addison-Wesley Professional, 2011, ISBN-13: 978-0321573513				
References						
Course Ou	tcome					
1	Understand th	e design, analysis and implementation of graphs and algorithms				
2	Be familiar wit	h standard symbol manipulations that arise in algorithm design				
3		w to calculate the efficiency of implementing specific operations and Understand n of algorithms and data structure in a modern programming language like Java /				
4	Enhance progr structures	ramming skills through the proficient use of newly learned algorithms and data				
5	Present one's	e's work and results in a convincing way.				
Course Eva	aluation					
In-term Studies Qu			Quantity	Percentage		
Midterms				1	30	
Quizzes			2	10		
Projects			1	10		
Term Projects			0	0		
Laboratory 0			0	0		
Class Participation 1				10		
Total in-term evaluation percent			60			
Final exam percent					40	
Total				100		
ECTS Work	cload (Based o	n Student Workload)				
Activities			Quantity	Duration (hours)	Total (hours	
Course duration (Including the exam week: 16x Total hours of the course)			16	4	64	

ECTS					
Total Work Load / 25 (hours)					
Total Work Load					
Other	0	0	0		
Final Exam	1	2	2		
Midterms	1	2	2		
Duties	1	4	4		
Study hours outside the classroom (Preparation, Practice, etc.)	14	4	56		
the course)	16	4	64		