



INTERNATIONAL UNIVERSITY OF SARAJEVO
FACULTY OF ENGINEERING AND NATURAL SCIENCES
CS302 - Algorithms and Data Structures
AY 2019-2020

Course Code	Course Title		Weekly Hours*			ECTS	Weekly Class Schedule
			T	A	L		
CS302	Algorithms and Data Structures		3	0	2	6	TUE: 13:00-14:50 THU: 11:00-11:50
Prerequisite	MATH204, CS105	It is a prerequisite to	CS417				
Lecturer	Assist. Prof. Dr. Emine Yaman		Office Hours Schedule			Mo:11:00-13:00, Tue: 11:00-13:00, Wed:13:00-15:00	
E-mail	eyaman@ius.edu.ba						
Phone	205		Office / Room No			BF2.7C	
Assistant	Admir Ferhatovic						
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Course Objectives	The objective of the course is to introduce and train students in design and analysis of data structures and algorithms in the program implementation. It demonstrates the analysis of the computational complexity of programs along with their comparative analysis.						
Textbook	First book: The Algorithm Design Manual, 2nd Edition, Steven S. Skiena, Springer. Second book: Algorithms Made Easy, 5th edition, Narasimha Karumanchi, M.Tech.						
Learning Outcomes	After successful completion of the course, the student will be able to:						
	1	Define basic types of data structures like stacks, queues, sets, arrays, etc.					
	2	Define, explain and use various algorithmic paradigms for problem-solving					
	3	Modify existing and develop new efficient algorithms					
	4	Analyze complexity of algorithms					
	5	Be able to recognize the appropriate algorithmic method to solve a newly given problem					
Teaching Methods	Class discussions with examples. Active tutorial sessions for engaged learning and continuous feedback on progress. Active lab involve real algorithms, analysis, interpretation						
WEEK	TOPIC					REFERENCE	
Week 1	Introduction to course					Chapter 1	
Week 2	Basic Data Structures (Stacks, Queues, Sets, Arrays, Lists)					Chapter 3	
Week 3	Algorithm Analyses (Running Time)					Chapter 2	
Week 4	Searching (Linear Search, Binary Search)					Chapter 4	
Week 5	Sorting (Bubble sort, Insertion Sort, Selection Sort)					Chapter 4	
Week 6	Divide Conquer (Quick Sort, Merge Sort)					Chapter 4	
Week 7	Binary Trees, Tree Traversal					Chapter 6	
Week 8	Review+MIDTERM EXAM						
Week 9	Binary Search Trees, AVL Trees					Chapter 6	
Week 10	B tree					Chapter 7	
Week 11	Hashing					Chapter 7	
Week 12	Heaps					Chapter 4	
Week 13	Graphs					Chapter 5,6	
Week 14	Dynamic Programming					Chapter 8	
Week 15	Review						
Assessment Methods and Criteria	Evaluation Tool		Quantity		Weight	Alignment with LOs	
	Final Exam		1		35	1,2,3,4,5,6,7,8	
	Semester Evaluation Components				65		
	Midterm Exam		1		30	1,2,3,4,6	
	Quizzes		2		20	1,2,3,4,5,6,7,8	
	Homeworks		3		15	1,2,3,4,5,6,7,8	
*** ECTS Credit Calculation ***							
Activity	Hours	Weeks	Student Workload Hours	Activity	Hours	Weeks	Student Workload Hours
Lecture Hours	3	15	45	Midterm exam study	10	1	10
Homeworks	6	3	18	Final Exam study	15	1	15
Active Tutorials	2	10	20	Home Study	2	15	30
Quizzes study	6	2	12	Total Workload Hours =			150
ECTS Credit =							6