

1. Course Name:	
ANALYSIS AND DESIGN OF ALGORITHMS	
2. Course Code:	
ANDA215	
3. Semester / Year:	
Semester	
4. Description Preparation Date:	
17-11-2025	
5. Available Attendance Forms:	
Weekly (Theory: 2 hours, Practically: 2 hours)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Theory: 30 Hours Practically: 30 hours Total: 60 hours Total Units: 6	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Mustafa Salam Kadh Email: mst.salam@uomustansiriyah.edu.iq	
8. Course Objectives	
Course Objectiv	1. Enable the student to be able to identify, the best way to design and Analy an algorithm. 2. Study the basic types of algorithms to solve a group of known problems w their Practical application. 3. Enable the student to know the Basic methods of how to analyze complex of algorithms.
9. Teaching and Learning Strategies	
Strategy	1. Delivering theoretical & practical lectures on analysis and design algorithms curriculum. 2. Employing discussion and question-and-answer sessions in the classroom foster dialogue. 3. Assigning homework, program writing, and discussion to students 4. Writing reports on scientific topics related to algorithms. 5. Daily assessment, weekly assessment, term assessment, objective question general knowledge questions, and practical exams.
6. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Th.:2 Pr.: 2	Introduction to algorithms	Concepts and properties of algorithms	Lect. & Lab.	Exam
2	Th.:2 Pr.: 2	Best, Average, and Worst cases	Differences among best ,expected and worst case behaviors of an algorithm	Lect. & Lab.	Quiz
3	Th.:2 Pr.: 2	Programs evaluation	Computing by calculating how programs are evaluated. Rule of algorithms in problem solving process	Lect. & Lab.	Homework
4	Th.:2 Pr.: 2	Problem solving strategies	Iteration and recursive traversal data structure Modularity	Lect. & Lab.	Exam
5	Th.:2 Pr.: 2	implementation of algorithms	Algorithms strategy 4-color mapping	Lect. & Lab.	Quiz
6	Th.:2 Pr.: 2	implementation of algorithms	Traveling Salesman Shortest Path	Lect. & Lab.	Homework
7	Th.:2 Pr.: 2		Mid-term Exam	Lect. & Lab.	Exam
8	Th.:2H Pr.: 3H	implementation of algorithms	Brute force algorithm Greedy algorithm	Lect. & Lab.	Quiz
9	Th.:2H Pr.: 3H	implementation of algorithms	Divide and conquer Recursive backtracking	Lect. & Lab.	Homework
10	Th.:2H Pr.: 3H	implementation of algorithms	Dynamic programming Network flow	Lect. & Lab.	Exam
11	Th.:2H Pr.: 3H	implementation of algorithms	Branch and bound heuristics	Lect. & Lab.	Quiz
12	Th.:2H Pr.: 3H	implementation of algorithms	reduction : transform and conquer	Lect. & Lab.	Homework
13	Th.:2H Pr.: 3H	Approximation Algorithms	Euclidian tour, Vertex cover, Knapsack	Lect. & Lab.	Exam
14	Th.:2H Pr.: 3H	algorithms efficiency	operation count	Lect. & Lab.	Quiz
15	Th.:2H Pr.: 3H	fundamental design concepts and principals	• abstraction • decomposition • encapsulation	Lect. & Lab.	Homework

7. Course Evaluation

The grade distribution is as follows:

Assessment: Formative 40 marks, Monthly exam 10 marks

Final exam: Theory 40 marks, Practical 10 marks

8. Learning and Teaching Resources

Required textbooks (curricular books any)	
Main references (sources)	1-Algorithm design” by Jon Kleinberg &Eva Tardos, Addison Wesley (Pearson Inc.),2008 2-Design and analysis of algorithms, fall 2008
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	/www.geeksforgeeks.org/dsa/design-and-analysis-of-algorithm-tutorial/

Course Description Form