Course Description Form

1. Course Name
Algorithm and its complexity
2. Course Code
CSAI3109
3. Semester / Year
First Semester
4. Description Preparation Date
18/2/2025
5. Available Attendance Forms:
Theoretical and practical presence
6. Number of Credit Hours (Total) / Number of Units (Total)
30 Hours theoretical and 30 Hours practical/ 3 units
7. Course administrator's name (mention all, if more than one name)
Name: EMAN SHAKIR MAHMOOD **Email: 110036@uotechnology.edu.iq**
8. Course Objectives

Course Objectives	• **Enable the student to know the Basic methods of how to analyze complexity of algorithms** •**Study the basic types of algorithms to solve a group of known problems with their Practical application** • **Enable the student to know How to reduce complexity using several programming methods and how to distinguish between programming techniques and test the best ones**

9. Teaching and Learning Strategies

Strategy	1- **Methodological books, resources (internet and library), lectures reinforced w illustrative examples.** 2- **Theoretical lectures, laboratories, practical tasks, using modern equipment present practical ideas to students (data show, electronic board).**

3- **Course Structure**

Week	Hours	Required Learning	Unit or subject name	Learning method	Evaluation method

		Outcomes			
1	2	1,2,3,6,7	Introduction	Classroom and Laboratory	Homework
2	2	1,2,3,6,7	-Some Problems (Knapsack,4-color mapping	Classroom and Laboratory	Discussion
3	2	1,2,3,6,7	Traveling Salesman, Shortest Path	Classroom and Laboratory	Quiz
4	2	1,2,3,6,7	Subset Sum, Scheduling, Closest Pair of Point …).	Classroom and Laboratory	Homework
5	2	1,2,3,6,7	Ω,Θ and O notations	Classroom and Laboratory	Discussion
6	2	1,2,3,6,7	-Greedy Algorithms.	Classroom and Laboratory	Quiz
7	2	1,2,3,6,7	-Divide – and – Conquer Algorithms.	Classroom and Laboratory	Homework
8	2	1,2,3,6,7	-Dynamic Programming.	Classroom and Laboratory	Homework
9	2	1,2,3,6,7	●Dynamic programming ●Network flow	Classroom and Laboratory	Discussion
10	2	1,2,3,6,7	-Network Flow.	Classroom and Laboratory	Homework
11	2	1,2,3,6,7	Approximation Algorithms	Classroom and Laboratory	Discussion
12	2	1,2,3,6,7	Approximation Algorithms	Classroom and Laboratory	Homework
13	2	1,2,3,6,7	-String Matching Algorithm	Classroom and Laboratory	Homework
14	2	1,2,3,6,7	-String Matching Algorithm	Classroom and Laboratory	Quiz

4- Course Evaluation

exams
daily duties
Attendees

5- 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-**Algorithms and complexities**, Herbert S. Wilf
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	