# **Academic Program Description Form**

University Name: Tikrit Faculty/Institute: Science and mathematic Scientific Department: Computer Science Academic or Professional Program Name: Data structure Final Certificate Name: Bachelor of Computer Science Academic System: COUISES Description Preparation Date: File Completion Date:25/3/2024

Signature: Head of Department Name: Signature: Scientific Associate Name:

Mohammed Akthim Ahmed

**Mashary Askar** 

Date:

Date:

The file is checked by: Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department: Date:

Signature:

Approval of the Dean

#### 1. Program Vision

This academic program description provides a necessary summary of the most important characteristics of the program and the learning outcomes that the student is expected to achieve, demonstrating whether he or she has made the most of the available opportunities. It is accompanied by a description of each course within the program

### 2. Program Mission

3. Program Objectives: The academic program in the Computer Science Department aims to:

Building the student scientifically and qualifying him to work in the field of computer science.

Building and preparing the student psychologically to play his role as a reliable programmer in this field.

Re-explaining the basics of programming to the student in the C++ language.

A general definition of data structures and how data is stored in memory.

The difference between linear and nonlinear data structures.

A detailed explanation of algorithms and how to program them.

Teaching the student to calculate the time complexity of the algorithm.

#### 4. Program Accreditation

A- Cognitive objectives

A1 - Knowledge of the basic concepts of data structures.

A2 - The student learns about the importance of general concepts of algorithms.

A3 - Identify the most important algorithms used to organize data in memory

A4 - Study the most important factors that affect the speed of algorithm execution

B - The skills objectives of the course

B1 - The student learns to use appropriate algorithms to organize data in memory.

B2 - Prepare qualified cadres to teach how to build and program the algorithm.

B3 - Identify how to choose the appropriate algorithm in terms of speed of implementation and utilization of memory in terms of space.

5. Other external influences

Traditional lectures and discussion style

Laboratory activities and preparing reports

Advanced lectures (presentation)

Using online class discussion on Google Classroom.

Using simulation programs prepared for this purpose on computers inside the laboratory

Use some illustrative pictures and videos that explain how the algorithms work

Courses structure

Week	Hours	Required Learning	Unit or subject	Learning	Evaluation
			name	method	method
1	4	Code Block Intro DataStructure	Code Block Intro DataStructure	Traditional lectures, discussion style, and presentation	Discussion and tests
2	4	Introduction to Data Structures	Introduction to Data Structures	Traditional lectures, discussion style, and presentation	Discussion and tests
3	4	Complexity analysis	Complexity analysis	Traditional lectures, discussion style, and presentation	Discussion and tests
4	4	Array	Array	Traditional lectures, discussion style, and presentation	Discussion and tests
5	4	Array	Array	Traditional lectures,	Discussion and tests

		Implementation	Implementation	discussion	
				style, and	
				presentation	
6	4		Depresent	Traditional	Discussion and
		Represent arrays	Represent	lectures,	tests
		in memory	arrays in	discussion	
		in memory	memory	style, and	
			-	presentation	
7	4			Traditional	Discussion and
				lectures,	tests
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				style, and	
-	_			presentation	<b>D</b> : 1
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		Stack	Stack	discussion	
				style, and	
-			<b>.</b> .	presentation	
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			Operations and	lectures,	tests
		and Applications of	Applications of	discussion	
		Stack	Stack	style, and	
			Oldok	presentation	
10	4			Traditional	Discussion and
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		Expression	Expression	discussion	10515
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				presentation	
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		Infix to Postfix	Notation	lectures,	tests
		Notation		discussion	
		Evaluation of	Evaluation of	style, and	
		Postfix Expression	Postfix	presentation	
			Expression	•	
12	4	Introduction to	Introduction to	Traditional	Discussion and
		Queues	Queues	lectures,	tests
		Quoquoo	Quodoo	discussion	
				style, and	
				presentation	
13	4	Array	Array	Traditional	Discussion and
		Representation of	Representation	lectures,	tests
		Queue	of Queue	discussion	
				style, and	
				presentation	
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				style, and	
				presentation	
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				style and	
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14	4	Insertion Sort Quick Sort	Intro of Graph	Traditional lectures, discussion style, and presentation	Discussion and tests
15	4	Heap Sort	Representation of Graph	Traditional lectures, discussion style, and presentation	Discussion and tests

## 13. Course development plan

Plans are made to develop the students' personalities by holding discussion sessions with them and asking them to submit weekly reports

Vocabulary changes annually by 10% based on modern sources.

## 14. Course development plan

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15. The most important sources of information about the program

### College website.

The department's website and email.

16. Infrastructure	
A- Required textbooks:	Vinu V Das, Principles of Data Structures
	Using C and C++
B- Main references (sources)	<ul> <li>Lectures presented by the subject teacher</li> </ul>
	<ul> <li>Books available in the college library</li> </ul>
C- Recommended books and references	Ramesh Vasappanavara, Anand
(scientific journals, reports,)	Vasappanavara, Data Structures using
	C by practice,
	D.S. MALIK, Data Structures Using
	C++, 2nd Edition,

	Robert L. Kruse, Alexander J. Ryba, Data Structures and Program Design in C++,
D- Electronic references, Internet sites	Any other materials available on the web.