



Course Specification

— (Bachelor)

Course Title: **Data Structure**

Course Code: **501324-3**

Program: **Bachelor of Computer Science**

Department: **Department of Computer Science**

College: **College of Computers and Information Technology**

Institution: **Taif University**

Version: **1**

Last Revision Date: **08-02-2024**



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A. General information about the course:

1. Course Identification

1. Credit hours: (3)

2. Course type

A. University College Department Track Others
B. Required Elective

3. Level/year at which this course is offered: (7/3)

4. Course general Description:

Introduces students to development, implementation, and analysis of efficient data structures and algorithms. Topics include analysis of sorting and searching algorithms and abstract data types such as stacks, queues, linked list, trees, graphs, and hash tables.

5. Pre-requirements for this course (if any):

501222-3 (Programming 2)

6. Co-requirements for this course (if any):

NON

7. Course Main Objective(s):

- To develop students' knowledge in data structures and the associated algorithms, introduce the concepts and techniques of structuring and operating on Abstract Data Types in problem solving, discuss common sorting, searching and graph algorithms, study the complexity and comparisons among these various techniques and apply and implement learned algorithm design techniques and data structures to solve problems.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3	60%
2	Blended	0	0





No	Mode of Instruction	Contact Hours	Percentage
3	E-learning	0	0
4	Distance learning	0	0
5	Other (Lab)	2	40%

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lecture	45
2.	Laboratory/Studio	30
3.	Tutorial	0
4.	Others (specify)	0
Total		75

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Understand pointer and the linked list data structure to solve problems.	K1	Lecture Problem Solving	Written Exams Quizzes
1.2	Understand the stack and queues data structures to solve problems.	K1	Lecture Problem Solving	Written Exams Quizzes



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.0	Skills			
2.1	Apply basic data structures in implementing simple applications.	S1	Lectures Lectures Labs	Direct Assessment Tool Class Discussions /Quizzes / Homework/ Exams Indirect Assessment Tool Course Exit Survey
2.2	Apply different data structures (binary tree, binary search tree, hash, graph etc.) to solve problems	S1	Lectures Labs	Direct Assessment Tool Class Discussions /Quizzes / Homework / Exams Indirect Assessment
2.3	Use different search and sort algorithms to analyze collection of data, and analyze algorithms using big-O notation	S1	Lectures Labs	Direct Assessment Tool Class Discussions /Quizzes / Homework/



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	Values			

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Data Structures and understanding standard data structures.	10
2.	Linked Lists	10
3.	Stacks and Queues	10
4.	Trees	10
5.	Algorithm Analysis	5
6.	Searching and sorting Algorithms Analysis	10
7.	Hash Tables	10
8.	Graph	10
Total		75

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework / Students' Participation in class discussion-Attendance	Every Week	10%
2.	Quizzes	Week 4 & 12	15%
3.	Mid-Term and Final lab Exam	Weeks 7 & 14	15%





No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
4.	Mid-Term	Week 8	20%
5.	Final Examination	Week 16	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Algorithms and Data Structures by N. Wirth
Supportive References	* Text Book: Data Structures and Algorithm Analysis in C *Lectures Slides
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources	
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> A Lecture room appropriate for maximum 25 students with a personal computer, a data show and a smart board. 	
Technology equipment (projector, smart board, software)	<ul style="list-style-type: none"> Video projector / data show 	
Other equipment (depending on the nature of the specialty)		
Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	<ul style="list-style-type: none"> Students Faculty members Coordinator Council Curriculum Committees 	<ul style="list-style-type: none"> Course exit survey Feedback from Faculty members Feedback from Course Coordinator Feedback from council Feedback from Curriculum Committees
Effectiveness of	<ul style="list-style-type: none"> Students Faculty members Coordinator 	<ul style="list-style-type: none"> Course exit survey Feedback from Faculty members





Assessment Areas/Issues	Assessor	Assessment Methods
Students assessment	<ul style="list-style-type: none"> • Council • Curriculum Committees 	<ul style="list-style-type: none"> • Feedback from Course Coordinator • Feedback from council • Feedback from Curriculum Committees
Quality of learning resources	<ul style="list-style-type: none"> • Students • Faculty members • Coordinator • Council • Curriculum Committees 	<ul style="list-style-type: none"> • Course exit survey • Feedback from Faculty members • Feedback from Course Coordinator • Feedback from council • Feedback from Curriculum Committees
The extent to which CLOs have been achieved	<ul style="list-style-type: none"> • Students • Faculty members • Coordinator • Council • Curriculum Committees 	<ul style="list-style-type: none"> • Course exit survey • Feedback from Faculty members • Feedback from Course Coordinator • Feedback from council • Feedback from Curriculum Committees
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	CS council
REFERENCE NO.	Meeting #11
DATE	07/03/2024

