



Course Specifications

Course Title:	Data Structure
Course Code:	1411210-3
Program:	Diploma in Programming Technology
Department:	Technology department
College:	Applied College
Institution:	Taif University

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A. Course Identification

1. Credit hours:	3
2. Course type	
a.	University ☐ College ☐ Department ☒ Others ☐
b.	Required ☒ Elective ☐
3. Level/year at which this course is offered: Second Year / Sixth Level	
4. Pre-requisites for this course (if any): NULL	
5. Co-requisites for this course (if any): NULL	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	6	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other (Lab)		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	
4	Others (specify)	
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description

In this course students will learn different data structure in Java and their implementation. The topics in this course are going to cover data structures such as arrays, ArrayList, vectors, stacks, queues, trees and some of the most powerful sorting, searching, map and hashtables.

2. Course Main Objective

This course develop students' knowledge in data structures that used in application development and the associated algorithms.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Understand basic data structures and their applications in problem solving.	K1
2	Skills :	



CLOs		Aligned PLOs
2.1	Implement basic data structures in implementing simple applications.	S2
2.2	Use advance data structures such as stacks, queues, trees and some of the most powerful sorting, searching, and hashing algorithms.	S2
2.3	Able to solve computing problems using appropriate data structures	S2
3	Values:	

C. Course Content

No	List of Topics (Lab and Theory)	Contact Hours
1	Basic Data Structures (Arrays, ArrayList, Vectors)	6
2	Linked List Theory and Implementation	6
3	List and Iterator ADTs	6
4	Stack Theory + Implementation	6
5	Queue Theory + Implementation	6
6	Popular Searching Algorithms (Linear Search, Binary Search)	6
7	Popular Sorting Algorithms (Bubble sort, Selection Sort, Insertion Sort)	6
8	Tree data structure	6
9	Maps and Hash Tables	6
10	Review	6
Total		60

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Cod e	Course Learning Outcomes	TeachingStrategie s	AssessmentMethods
1.0	Knowledge and Understanding		
1.1	Understand basic data structures and their applications in problem solving.	Lectures Labs	Direct Quizzes / Homework Exams Indirect Course Exit Survey
2.0	Skills		
2.1	Implement basic data structures in implementing simple applications.	Lectures Labs	Direct Assessment Tool Lab Exams Indirect Assessment Tool Course Exit Survey
2.2	Ability to use advance data structures such as stacks, queues, trees and some of the	Lectures Labs	Direct Assessment Tool



Cod e	Course Learning Outcomes	TeachingStrategie s	AssessmentMethods
	most powerful sorting, searching, and hashing algorithms.		Lab Exams Indirect Assessment Tool Course Exit Survey
2.3	Ability to solve computing problems using appropriate data structures	Lectures Labs	Direct Assessment Tool Lab Exams Indirect Assessment Tool Course Exit Survey
3.0	Values		

2. Assessment Tasks for Students

#	*Assessment task	Week Due	Percentage of Total Assessment Score
1	Mid-Term	6	20%
2	Quizzes	4	5%
3	Home Works/ Attendance / Evaluation/project	Every Week	10 %
4	Final Labs Exam	11	15%
5	Final Examination	12	50%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- ✓ Providing a guide for each group of students, and distributing student lists electronically to faculty members.
- ✓ There is an academic advising guide that defines the role of the faculty member in the academic advising process.
- ✓ The program supervisor is available throughout the year to answer student inquiries.
- ✓ Availability of full information about the program and its members and ways to communicate with them.
- ✓ Use the Learning Management System (Black Board) to communicate with students
- ❖ Student Handbook, Deanship of Student Affairs.
https://www.tu.edu.sa/Attachments/893d1c33-3156-44d7-b4b8-e203d4cca737_.pdf
- ❖ Student Handbook at Taif University.
https://www.tu.edu.sa/Attachments/41dc8a24-22b7-4ae1-9b31-3608de8bcf8b_.pdf

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	❖ Data Structures and Algorithms in Java 6th Edition by Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser
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Essential References Materials	❖ Beginning Java Data Structures and Algorithms, by James Cutajar ISBN: 9781789533750
Electronic Materials	❖ https://www.tutorialspoint.com/java/java_data_structures.htm
Other Learning Materials	NULL

2. Facilities Required

Item	Resources
Accommodation Classrooms, laboratories, (demonstration rooms/labs, etc)	❖ Classroom with 50 chairs ❖ Lab with 25 chairs
Technology Resources AV, data show, Smart Board, (software, etc)	❖ Availability of a Data Show ❖ Provides a smart board. ❖ Provide a whiteboard and colored whiteboard pens.
Other Resources Specify, e.g. if specific laboratory equipment is required, list (requirements or attach a list)	❖ Null

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching	- Students - Faculty members - Coordinator - Program Leaders	- Course exit survey - Feedback from Faculty members - Feedback from Course Coordinator - Feedback from Quality Committees
Effectiveness of assessment	- Faculty members - Coordinator - Program Leaders	- Feedback from Faculty members - Feedback from Course Coordinator - Feedback from Program Leader
Extent of course achievement	- Students - Coordinator	- Course exit survey - Curriculum Committees - Feedback from Course Coordinator - Feedback from Program Leader



Evaluation Areas/Issues	Evaluators	Evaluation Methods
	Faculty members	
Extent of course learning outcomes	- Faculty members - Coordinator - Program Leaders - Quality Committees	- Course exit survey - Curriculum Committees - Feedback from Course Coordinator - Feedback from Program Leader - Feedback from Quality Committees
Quality of learning resources	- Students - Faculty members - Coordinator	- Course exit survey - Course exit survey - Curriculum Committees - Feedback from Course Coordinator - Feedback from Program Leader

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

