Republic of Iraq
Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate
Quality Assurance and Academic Accreditation

Academic Program Specification Form
For The Academic

University: of Baghdad
College : Al_Khwarizmi College of Engineering
Number Of Departments In The College : 5
Date Of Form Completion : Oct 2023

Dean 's Name

Date :   /   /

Signature

Dean 's Assistant For Scientific Affairs

Date :   /   /
Signature

The College Quality Assurance And University Performance Manager

Date :   /   /
Signature

Quality Assurance And University Performance Manager
Date :   /   /
Signature

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAMME SPECIFICATION

This Programme Specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It is supported by a specification for each course that contributes to the programme.

1. Teaching Institution	University of Baghdad/Al_Khwarizmi College of Engineering
2. University Department/Centre	Information and Communication Engineering
3. Programme Title	Data Structure
4. Title of Final Award	BS.C
5. Modes of Attendance offered	attendance is mandatory according to the university rules in 2023-2024
6. Accreditation	Abet
7. Other external influences	
8. Date of production/revision of this specification	Oct/2023

9. Aims of the Programme

1) Understanding how the performance of a program or algorithm is measured and compared.
2) Study the basic data structure containers.
3) Study the basic use of linear and non-linear data structures.

10. Learning Outcomes, Teaching, Learning and Assessment Methods

At the completion of the course, students will be able to…

A1. Write efficient software able to process and contain data efficiently.

A2. Choose, design, or implement a computer-based algorithm.

A3. Qualified to attend the more advanced courses like operating systems and computer networks.

B. The skills goals special to the programme .

In addition to the measurable student learning outcomes listed above, students enrolled in the Data structure Course will be required to demonstrate their more in-depth knowledge of the course material by

B1. Take real-life software and apply the analysis and performance measurement methods as well as choose the proper data structure for each programming task.

Teaching and Learning Methods

Lectures, Presentations, Recitation, and Documentations

Assessment methods

homework 10%

quizzes - 10%

 midterm -20%

laboratory-10%

 final - 50%

C. Affective and value goals

C1. Ability to analyze any problem and choose the correct data structure for it.

C2. Ability to determine the hotspots program or algorithm.

C3. Ability to derive the correctness of program and data structure.

C4. The student would increase its ability to model a real-world problem into algorithm.

Teaching and Learning Methods

Lectures, Presentations, Recitation, and Documentations

Assessment methods

homework 10%

quizzes - 10%

 midterm -20%

laboratory-10%

 final - 50%

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Essential in any academic work in the direction of computer science and engineering.

D2.   Essential for any software development.

Teaching and Learning Methods

Lectures, Presentations, Recitation, and Documentations

Assessment methods

homework 10%

quizzes - 10%

midterm -20%

laboratory-10%

final - 50%

11. Programme Structure				12. Awards and Credits
Level/Year	Course or Module Code	Course or Module Title	Credit rating	
3rd class	ICE3	Data Structure	4	Bachelor Degree
				Requires (x) credits

13. Personal Development Planning

- Implement the algorithms using different OOP languages like (C++).
- Apply different applications using studied data structures.

14. Admission criteria.

According to the rules of the Ministry of Higher Education and Scientific Research in Iraq.

15. Key sources of information about the programme
1. Books 2. Trusted Internet sources related to the Program 3. Papers.

Curriculum Skills Map

please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

Year / Level	Course Code	Course Title	Core (C) Title or Option (O)	Programme Learning Outcomes															
				Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Third		Data Structure	C	■	■	■		■	■			■	■	■	■	■	■		

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad/Al_Khwarizmi College of Engineering
2. University Department/Centre	Information and Communication Engineering
3. Course title/code	Data Structure
4. Modes of Attendance offered	attendance is mandatory according to the university rules in 2023-2024
5. Semester/Year	2023 – 2024 / 1st Course
6. Number of hours tuition (total)	90
7. Date of production/revision of this specification	Oct/ 2023
9. Aims of the Course	

1) Understanding how the performance of a program or algorithm is measured and compared.
2) Study the basic data structure containers.
3) Study the basic use of linear and non-linear data structure.

9· Learning Outcomes, Teaching ,Learning and Assessment Methode
A- Knowledge and Understanding At the completion of the course, students will be able to… A1. Write efficient software able to process and contain data efficiently. A2. Choose, design, or implement computer-based algorithms. A3. Qualified to attend the more advanced courses like operating systems and computer networks.
B. Subject-specific skills In addition to the measurable student learning outcomes listed above, students enrolled in the Data structure Course will be required to demonstrate their more in-depth knowledge of the course material by B1. Take real-life software and apply the analysis and performance measurement methods as well as choose the proper data structure for each programming task.
Teaching and Learning Methods
Lectures, Presentations, Recitation, and Documentations
Assessment methods
homework 10%

quizzes - 10%

midterm -20%

laboratory-10%

final - 50%

C. Thinking Skills
  C1. Ability to analyze any problem and choose the correct data structure for it.

  C2. Ability to determine the hotspots program or algorithm.

  C3. Ability to derive the correctness of program and data structure.

  C4. The student would increase its ability to model a real-world problem into algorithm.

D. General and Transferable Skills (other skills relevant to employability and personal development)

  D1. Essential in any academic work in the direction of computer science and engineering.

  D2. Essential for any software development.

10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	6		Introduction of Programming Principles and specification and design	Classroom with whiteboard and Lab	Quizzes
2	6		Pointers and Dynamic Array	Classroom with whiteboard and Lab	Quizzes
3	6		Single Linked List	Classroom with whiteboard and Lab	Quizzes

4	6		Circular Linked List	Classroom with whiteboard and Lab	Quizzes
5	6		Double Linked List	Classroom with whiteboard and Lab	Quizzes
6	6		Stack : Static and Dynamic.	Classroom with whiteboard and Lab	Quizzes
7	6		Stack Applications	Classroom with whiteboard and Lab	Quizzes
8	6		Queue :Static and Dynamic	Classroom with whiteboard and Lab	Quizzes
9	6		Queue Applications	Classroom with whiteboard and Lab	Quizzes
10	6		Tutorial of Engineering Applications	-	-
11	6		Tree : Binary Search Tree	Classroom with whiteboard and Lab	Quizzes
12	6		Binary Heap	Classroom with whiteboard and Lab	Quizzes
13	6		Graph principles	Classroom with whiteboard and Lab	Quizzes
14	6		DFS, BFS and paths in Graph.	Classroom with whiteboard and Lab	Quizzes
15	6		Dijkstra Algorithm	Classroom with whiteboard and Lab	Quizzes

11. Infrastructure	
1. Books Required reading:	Text book 1:" Data structures and other objects using C++" by Michael Main, Walter Savitch, Addison-Wesley, 4th ed, 2011. Text book2:" Data Structures and Algorithm Analysis", by Clifford A. Shaffer, Virginia Tech, Dover Publications, Edition 3.2 (C++ Version), 2012. Text book3: "Data structures and algorithm analysis in C++", by Mark Allen Weiss, Florida International University, Addison-Wesley, Fourth edition, 2014.

	Text book4: "Data Abstraction & Problem Solving with C++", by Frank M. Carrano and Timothy Henry , Pearson Education, Inc., publishing as Addison-Wesley, 6th edition, 2013. LAB : C++ IDE Software
2. Main references (sources)	Text book 1:" Data structures and other objects using C++" by Michael Main, Walter Savitch, Addison-Wesley, 4th ed, 2011.
A- Recommended books and references (scientific journals, reports…).	C++ compiler
B-Electronic references, Internet sites…	

12. The development of the curriculum plan
● Implement the algorithms using different OOP languages like (C++). ● Apply different applications using studied data structures.