Republic of Iraq

Ministry of Higher Education & Scientific Research

Supervision and Scientific Evaluation Directorate

Quality Assurance and Academic Accreditation

International Accreditation Dept.

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

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Dean ’s Assistant For Scientific Affairs

Date : / /

Signature

The College Quality Assurance And University Performance Manager

Date : / /

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Dean ’s Name

Date : / /

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Quality Assurance And University Performance Manager

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**TEMPLATE FOR PROGRAMME SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**PROGRAMME SPECIFICATION**

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| 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. |

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

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

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| **Curriculum Skills Map** | | | | | | | | | | | | | | | | | | | |
| **please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed** | | | | | | | | | | | | | | | | | | | |
| **Programme Learning Outcomes** | | | | | | | | | | | | | | | |  | | | |
| General and Transferable Skills (or) Other skills relevant to employability and personal development | | | | Thinking Skills | | | | Subject-specific skills | | | | Knowledge and  understanding | | | | Core (C)  Title or Option  (O**)** | Course Title | Course  Code | Year / Level |
| **D4** | **D3** | **D2** | **D1** | **C4** | **C3** | **C2** | **C1** | **B4** | **B3** | **B2** | **B1** | **A4** | **A3** | **A2** | **A1** |
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**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| 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. |

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

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| 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. |

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| 10. Course Structure | | | | | |
| Assessment Method | Teaching  Method | Unit/Module or Topic Title | ILOs | Hours | Week |
| Quizzes | Classroom with whiteboard and Lab | Introduction of Programming Principles and specification and design |  | 6 | 1 |
| Quizzes | Classroom with whiteboard and Lab | Pointers and Dynamic Array |  | 6 | 2 |
| Quizzes | Classroom with whiteboard and Lab | Single Linked List |  | 6 | 3 |
| Quizzes | Classroom with whiteboard and Lab | Circular Linked List |  | 6 | 4 |
| Quizzes | Classroom with whiteboard and Lab | Double Linked List |  | 6 | 5 |
| Quizzes | Classroom with whiteboard and Lab | Stack : Static and Dynamic. |  | 6 | 6 |
| Quizzes | Classroom with whiteboard and Lab | Stack Applications |  | 6 | 7 |
| Quizzes | Classroom with whiteboard and Lab | Queue :Static and Dynamic |  | 6 | 8 |
| Quizzes | Classroom with whiteboard and Lab | Queue Applications |  | 6 | 9 |
| - | - | Tutorial of Engineering Applications |  | 6 | 10 |
| Quizzes | Classroom with whiteboard and Lab | Tree : Binary Search Tree |  | 6 | 11 |
| Quizzes | Classroom with whiteboard and Lab | Binary Heap |  | 6 | 12 |
| Quizzes | Classroom with whiteboard and Lab | Graph principles |  | 6 | 13 |
| Quizzes | Classroom with whiteboard and Lab | DFS, BFS and paths in Graph. |  | 6 | 14 |
| Quizzes | Classroom with whiteboard and Lab | Dijkstra Algorithm |  | 6 | 15 |
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| 11. Infrastructure | |
| 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 | 1. Books Required reading: |
| Text book 1:” Data structures and other objects using C++” by Michael Main, Walter Savitch, Addison-Wesley, 4th ed, 2011. | 1. Main references (sources) |
| C++ compiler | A- Recommended books and references (scientific journals, reports…). |
|  | B-Electronic references, Internet sites… |

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