**Model 2.4
Faculty member + student**

**Course syllabus for Data Structures CS212D**

**1. Faculty member information:**

**Name of faculty member responsible for the course**

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| --- |
| Lecturer ala'a shamasneh |

Office Hours

|  |
| --- |
| Sunday , Tuesday, Thursday 1:30 -2:30 |

Office Number

|  |
| --- |
| 2.501.39 |

Email

|  |
| --- |
| Shamasneh2006@yahoo.com |

**2. Course overview and general information:**
College / Department

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| --- |
| Computer and Information Sciences-Computer Science |

Course Name and code

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| --- |
| Data Structures CS212D |

Number of credit hours

|  |
| --- |
| 3 credit hours |

Program or programs that offer this course

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| Computer science, information systems, and networks and communication systems |

Year/course level

|  |
| --- |
| Second Year-term 3 |

Prerequisites for this course (if any)

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| CS110D |

Current requirements for this course (if any)

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| NON |

Site (to be given if not inside the main building of the institution)

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| NON |

**3. Objectives of the course:**

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| * Be familiar with basic techniques of algorithm analysis.
* Be familiar with the concept of recursion.
* Master the implementation of linked data structures such as linked lists, stacks, and queues.
* Be familiar with advanced data structures such as balanced search trees, graphs and hash tables.
* Master the standard data structure library of a major programming language.
* Master analyzing problems and writing program solutions to problems using the above techniques.
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**4. Course** **description**:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Assessment methods |  Intended learning outcomes | Activity | Topic | Date | Week |
| Class participation, POP quizzes, presentation given in class.Final written exam and Labs evaluation | Student should understand and how to create data type. | Student should read the assigned chapter before each class.Instructors should teach students how to study, analyze, and think attentively and critically.Instructors should teach students to think independently and engage in group discussions.Encouragement of students to be creative in their presentation. | **Introduction to Data Structures**Course overviewProblem solving  |  | **1** |
| **Arrays**1 dimensional and multidirectional arrays, Linear and binary search, Bubble sorting |  | **2** |
| Student should be able to implement recursive functionUnderstand and implement linked data structures such as linked lists, stacks, queues and trees and use them appropriatelyStudent should be able to analyze problems and write program solutions to problems using the above techniques. | **Recursion**Linear recursion and Binary recursion. |  | **3,4** |
| **Linked Lists** Insertion Deletion, Double linked list (insertion and deletion), circular linked list, and sorting linked list. |  | **5,6** |
| **Midterm1** |  | 7(1st lecture ) |
| **Stacks**Stack Abstract Data Type.A Simple Array-Based Stack Implementation.Implementing a Stack with a Generic Linked List. |  | **7,8** |
| **Queues**Queues Abstract Data Type.A Simple Array-Based Queue Implementation.Implementing a Queue with a Generic Linked List. |  | **9** |
| Students should understand and implement advanced data structures such as trees, hash tables and graphs  | **Trees**General Trees, Tree Traversal Algorithms, Binary Trees |  | **9,10** |
| **Midterm2** |  | 11(1st lec) |
| **Graphs**The Graph Abstract Data Type, Graph Traversals, Shortest Path, minimum Spanning tree |  | **11,12**  |
| **Hash Table**Bucket Arrays, Hash Functions. |  | **13,14** |
| Revision | **15** |

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| --- | --- | --- |
| Lab Topics | Date | Week |
| Introduction to Data Structures |  | **1** |
| Selected problems on Arrays  |  | **2** |
| Selected problems on Recursion |  | **3,4** |
| Selected problems on Linked List |  | **5,6** |
| Selected problems on Stacks |  | **7,8** |

|  |  |  |
| --- | --- | --- |
| Selected problems on Queues |  | 9 |
| Selected problems on Trees |  | **9,10** |
| Selected problems on Graphs |  | **11,12**  |
| Selected problems on Hash Table |  | **13,14** |
| Revision |  | **15** |

**5. Books and references:**

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| --- |
| M. Goodrich, R. Tamassia, M. Goldwasser , "*Data Structures and Algorithms in Java*", John Wiley & Sons, Inc, 2014.R. Gilberg , B. Forouzan “Data Structures A pseudocode Approach with c++”, Brooks/Cole Publishing company, 2001  |

**6. Assessment methods and the division of grades:**

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| --- | --- | --- | --- | --- |
| Comments | Percentage from overall grade | Grade | Assessment Week  | Assessment method(Write an essay - test - a collective project - a final test ...) |
|  | 20% | 20 | Week 7 | Midterm 1 |
|  | 15% | 15 | Week 12 | Midterm 2 |
|  | 10% | 10 | Weeks 3, 5, 6,7, 8,9 10, 12 | Lab assignments, quizzes and participation |
|  | 15% | 15 | Week 14 | Practical project |
|  | 40% | 40 | After Week 15 | Final exam (Theory) |

**7. Instructions (if any):**

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