

1	Course title	Data structures -2
2	Course number	1901234
3	Credit hours (theory, practical)	3 (theory+practical)
	Contact hours (theory, practical)	3 (theory+practical)
4	Prerequisites/corequisites	Data structures 1 (1941233)
5	Program title	Computer Science
6	Program code	1
7	Awarding institution	The University of Jordan
8	Faculty	King Abdullah II for Information Technology
9	Department	Computer Science Department
10	Level of course	Second Year
11	Year of study and semester (s)	Any
12	Final Qualification	Bachelor (Bsc)
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Date of production/revision	
16	Required/ Elective	Required

**16. Course Coordinator:**

*Dr. Jamal Alsakran*  
*office hours: 12:30 - 1 (Sun thru Wed)*  
*phone numbers : 00962-065355000-22634*  
*email addresses : j.alsakran@ju.edu.jo*

**17. Other instructors:**

*Bassam Kasasbeh*

**18. Course Description:**

*Data type and structures; Abstract data types and encapsulation; Stacks; Queues; Recursion; Linked Lists; Binary trees; General trees; File organization: sequential and indexed files; Graphs: representation, traversing, shortest path; Sorting: exchange, insertion, quick sort, heap and others; Searching. Weekly practice in the lab.*

**19. Course aims and outcomes:**

<p><b>A- Aims:</b> The main goal of this course is to provide concepts about object oriented design of C++ and pointers, and its practical application in different linked data structures as Stacks; Queues; Recursion; Linked Lists; Binary trees; General trees</p>	
<p><b>B- Intended Learning Outcomes (ILOs):</b> Upon successful completion of this course students will be able to ...</p>	
<p><b>A- Knowledge and Understanding: Students should ...</b></p> <p>A1) Learn the organization and manipulation of data. A2) Know the important principles of program design. A3) Learn the powerful features of C++ programming language. A4) Understand the basic concepts involved in structured problem solving. A5) Understand the advantages of object oriented programming. A6) Grasp the advantages of data abstraction and abstract data types.</p>	
<p><b>B- Intellectual skills: with the ability to ...</b></p> <p>B1) Compare and analyze algorithms as fundamental tools of program design. B2) Apply mathematical tools to algorithm verification and analysis. B3) Analytically recognize large projects as smaller problems of manageable size.</p>	
<p><b>C- Subject specific skills – with ability to ...</b></p> <p>C1) Work on case studies to show how all the tools are used together to build a complete program. C2) Develop methods to reduce program errors, verify used algorithms, and efficiently debug programs. C3) Translate abstract ideas into practice. C4) Implement and handle large projects.</p>	
<p><b>D- Transferable skills – with ability to ...</b></p> <p>D1) Possess good programming style. D2) Develop advanced structures and algorithms into complete programs. D3) Choose the appropriate data structures for a certain project. D4) Maintain the usefulness of the program, including software reusability and maintenance.</p>	

## 20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
<b>Introduction to Pointers, classes, virtual functions and abstract classes</b>	1-2	All	A1-A6 D	Practical Quiz	Reading from lecture notes + lab practice
<b>Lists</b>	3-6	All	A1 B1 C1-C4 D	Practical Quiz	Reading from Text Book(chapter 5) + lecture notes + lab practice
<b>MidTerm Exam</b>	7			Practical	
<b>Recursion</b>	7-8	All	B3,D	Practical Quiz	Reading from Text Book(chapter 6) + lecture notes + lab practice

<b>Stacks</b>	9-10	All	A1 B1 C1-C4 D	Practical Quiz	Reading from Text Book(chapter 7) + lecture notes + lab practice
<b>Queues</b>	11-12	All	A1 B1 C1-C4 D	Practical Quiz	Reading from Text Book(chapter 8) + lecture notes + lab practice
<b>Binary Trees</b>	13-14	All	A1 C1-C4 D	Practical Quiz	Reading from Text Book(chapter 11) + lecture notes + lab practice
<b>Final exam</b>	15	All			

### 21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

**Lectures, lab and presentation**

### 22. Evaluation Methods and Course Requirements:

Teaching (T) strategies: The course is delivered using different means like lectures in the lab and presentation .  
 Learning (L) Methods: Students attend classes in lab for 3 hours per week, they participate in discussions, do assignments and ask questions.  
 Assessment (A) Methods: There are several methods of evaluation as grading practical quizzes and conducting the Midterm and Final exam.

### 23. Course Policies:

A- Attendance policies:

Maximum allowable absence 15% of number of lectures per semester.

B- Absences from exams and handing in assignments on time:

Students are expected to completely adhere to the assignments strict deadlines, absolutely no exceptions are given.

It's students responsibility to inform his instructor about his absence from any exam during period not exceeding 3 days.

C- Health and safety procedures:

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Students' cheating, plagiarism and misbehavior will be transformed to special commity.

E- Grading policy:

Intended grading scale

<b>0 - 40</b>	<b>F</b>
<b>41-49</b>	<b>D-</b>
<b>50-53</b>	<b>D</b>
<b>54-57</b>	<b>D+</b>
<b>58-61</b>	<b>C-</b>
<b>62-66</b>	<b>C</b>
<b>67-70</b>	<b>C+</b>
<b>71-75</b>	<b>B-</b>
<b>76-79</b>	<b>B</b>
<b>80-84</b>	<b>B+</b>
<b>85-89</b>	<b>A-</b>
<b>90-100</b>	<b>A</b>

F- Available university services that support achievement in the course:

Equipped Computer labs.

#### **24. Required equipment:**

1. Personal computers in labs.
2. Data show.
3. Microsoft Visual Studio Software.

**25. References:**

A- Required book (s), assigned reading and audio-visuals:

DATA STRUCTURES USING C++, by D.S. Malik, Second Edition.

B- Recommended books, materials, and media:

- Data Structures and Algorithms in C++, John Wiley and Sons, Michael T. Goodrich, Roberto Tamassia, David M. Mount, 2011.
- C++ Plus Data Structures, by Nell Dale, 2011.

**26. Additional information:****Moodle:**

<http://elearning.ju.edu.jo/>

**User Name and Password** are similar to the student's Internet account at the university

**Regulations:**

- Every student is expected to completely adhere to the assignments and project strict deadlines, absolutely no exceptions will be given.
- University Regulations should be respected. <http://www.ju.edu.jo/rules/index.htm>