Course Syllabus

1	**Course title**	Data Structure-2 Lab	
2	**Course number**	1901236	
3	**Credit hours**	1	
	Contact hours (theory, practical)	3 practical	
4	**Prerequisites/corequisites**	Simultaneously with Data Structures 2 (1901234)	
5	**Program title**	Computer Science	
6	**Program code**	01	
7	**Awarding institution**	The University of Jordan	
8	**School**	King Abdullah II School of Information Technology	
9	**Department**	Computer Science	
10	**Course level**	2	
11	**Year of study and semester (s)**	Second year or later	
١٢	**Other department (s) involved in teaching the course**	-	
١٣	**Main teaching language**	English	
١٤	**Delivery method**	☒Face to face learning ☐Blended ☐Fully online	
١٥	**Online platforms(s)**	☒Moodle ☒Microsoft Teams ☐Skype ☐Zoom ☐Others…………	
١٦	**Issuing/Revision Date**	10/2022	

١٧ Course Coordinator:

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١٨ Other instructors:

Name: Aroba Bqaeen
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١٩ Course Description:

This course explores how different data structures are implemented and their main applications, so the student can analyse any problem and identify the computer requirements appropriate to its solution.

It includes implementation of Pointers and pointer operations, including pointers in objects. Implementation of Linked list: singly, doubly, circular. Practical implementation of Linked Stacks and using Stack to calculate arithmetic expressions. Practical implementation of Linked Queues. Practical implementation of recursive functions on Binary Search Trees.

The students assessment will be based on practical quizzes and exams

٢٠ Course aims and outcomes:

A- Aims:

The main goal of this course is to provide concepts about object oriented design, and its practical application in different linked data structures as Stacks; Queues; Recursion; Linked Lists; Binary trees; General trees, and its implementation in a language such as C++.

B- Students Learning Outcomes (SLOs): Upon successful completion of this course students will be able to…

A- Knowledge and Understanding: Students should …

A1)   Understand the organization and manipulation of data.

A2)   Learn the powerful features of C++ programming language.

A3)   Understand the advantages of object oriented programming.

A4)   Grasp the advantages of data abstraction and abstract data types.

A5)   Understand the basics of linked stack, queue and tree using class and pointers.

B- Intellectual skills: with the ability to …

B1)   Compare and analyse algorithms as fundamental tools of program design.

B2)   Analytically recognize large projects as smaller problems of manageable size that use stacks, queues and trees.

C- Subject specific skills – with ability to …

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 that use stacks, queues and trees.

D- Transferable skills – with ability to

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.

٢١. Topic Outline and Schedule:

Week	Lecture	Topic	SO	Teaching Methods*/platform	Evaluation Methods**	References
1	1.1	**Review of Pointers, classes.**	1,2	Face to face lecturing/meeting	in class questions + project	
2	2.1	**Lists** •Single Linked Lists application implementation	1,2	Face to face lecturing/meeting	in class questions + project	Chapter5
3	3.1	**Lists** •Double Linked Lists application implementation	1,2	Face to face lecturing/meeting	in class questions + project	Chapter5
4	4.1	**Lists** •Circular or Ordered Linked Lists application implementation	1,2	Face to face lecturing/meeting	in class questions + project	Chapter5
5	5.1	**Stacks** •Linked stacks application implementation	1,2,6	Face to face lecturing/meeting	in class questions + project	Chapter6

6	6.1	**Queues** •Linked queues application implementation	1,2,6	Face to face lecturing/meeting	in class questions + project	Chapter 7
7	7.1	**Recursion** Implementation of recursive operations on DS.	1,2	Face to face lecturing/meeting	in class questions + project	
8	8.1	**Binary Trees** •BST application implementation	1,2	Face to face lecturing/meeting	in class questions + project	Chapter 9
9	9.1	•Red-Black Trees application implementation	1,2	Face to face lecturing/meeting	in class questions + project	
10	10.1	•AVL Trees application •Segment Trees application	1,2	Face to face lecturing/meeting	in class questions + project	

	11.1		1,2,6	Face to face lecturing/meeting		Chapter 10
11		**Hashing** Hashing table implementation			in class questions + project	
12	12.1	**Graph** Adjacency matrix implementation of graph	1,2,6	Face to face lecturing/meeting	in class questions + project	Chapter 12

٢٢ Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Projects and Quizzes	100	All	All	Every week	E-learning +juexams

۲۳ Course Requirements

students should have a

- Computer
- Internet connection
- Account on MS Teams, Moodle
- MS Visual Studio (C++)

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

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

If you miss the midterm, then a makeup exam will not be provided unless you submit a valid absence excuse, within three days from the midterm, to your lecturer. This excuse must be signed and stamped from the UJ hospital in order to be valid. If your lecturer accepts the excuse then you will be able to take the makeup. You need to follow up the departmental announcements regarding the makeup date and time. Please note that the lecturer may either accept or reject your excuse based on UJ regulations.

C- Health and safety procedures:

Full safety of the computer labs.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

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

مركـز الاعتماد
وضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER

E- Grading policy + Weighting (i.e. weight assigned to exams as well as other student work)

Intended grading scale

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

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

Equipped Computer labs.

G- Statement on Students with disabilities

Students with Disabilities: Students with disabilities who need special accommodations for this class are encouraged to meet with the instructor and/or their academic advisor as soon as possible. In order to receive accommodations for academic work in this course, students must inform the course instructor and/or their academic advisor, preferably in a written format, about their needs no later than the 4th week of classes.

٢٥ References:

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

C++ Data Structures, A Laboratory Course 3rd edition. By Stefan Brandle, Jonathan Geisler, James Roberge and David Whittington.

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.

٢٦ Additional information:

ملاحظة١: في حالة التغيب عن امتحان الـ Mid Term لن يكون هناك امتحان تعويضي إلا في حالة وجود عذر وحالة طارئة من المستشفى. على الطالب إبراز العذر لمدرس المادة في فتره لا تتجاوز الثلاثة أيام من تاريخ الامتحان, وللمدرس الحق في قبول أو رفض العذر , وحسب التعليمات.

ملاحظة٢: لتفادي المشاكل والأخطاء التي تنتج, لا يجوز إجراء النقل الداخلي بأي حال من الأحوال.

For more details on University regulations please visit http://www.ju.edu.jo/rules/index.htm

Moodle:

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

Name of Course Coordinator: **Ansar Khoury**   Signature: ---------------------- Date: 10/2022
Head of Curriculum Committee/Department: ------------------------- Signature: -------------------------------
Head of Department: --- Signature: ---------------------------
Head of Curriculum Committee/Faculty: ------------------------------------ Signature: -------------------------
Dean: --- Signature: --