Syrian Arab Republic		الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالـــي
Syrian Virtual University		الجامعة الافتراضية السورية

Course Description: Data Structures and Algorithms

1- Basic Information:

Course Name	**Data Structures and Algorithms**
Course ID	**DSA**
Contact Hours (Registered Sessions)	**16**
Contact Hours (Synchronized Sessions)	**16**
Mid Term Exam	**-**
Exam	**75 min**
Registered Sessions Work Load	**16**
Synchronized Session Work Load	**16**
Credit Hours	**4**

2- Pre-Requisites:

Course	ID
Computer Programming I	CP1
Computer Programming II	CP2

3- Course General Objectives:

The main objective of the course is to teach the students how to select and design data structures and algorithms that are appropriate for problems that they might encounter. This course is also about showing algorithms design strategies including divide-and-conquer, backtracking algorithms and the correctness of algorithms and studying their computational complexities. This course offers the students a mixture of theoretical knowledge and practical experience. It introduce the student to the concept of data structures through abstract data structures including lists, sorted lists, stacks, queues.

4- Intended Learning Outcomes (ILO):

Code	Intended Learning Outcomes
ILO1	Algorithm design
ILO2	Algorithm analysis
ILO3	Divide and conquer problem solving strategy and recursive algorithm
ILO4	Geometrical application of recursion
ILO5	Backtracking problem solving strategy
ILO6	Sorting algorithm
ILO7	Linear data structures

5- Course Syllabus (18 hours of total synchronized sessions;18 hours of total Recorded Sessions)

- **RS:** Recorded Sessions**; SS:** Synchronized Sessions**;**

ILO	Course Syllabus	RS	SS	Type	Additional Notes
ILO1	General definition for problem solving and algorithm and data stucture	2	2	☐ Exercises ☐ Assignments	
ILO2	Algorithm analysis and complexity Time and space complexity Average complexity Asymptotic comparison of complexity function Asymptotic notation	4	4	☐ Exercises ☐ Assignments	
ILO3	Recursion and recursive algorithms Master theorem of recursive algorithm complexity	4	4	☐ Exercises ☐ Assignments	
ILO4	Hilbert recursive draws Serbinsky recursive draws	2	2	☐ Exercises ☐ Assignments	

ILO5	Backtracking algorithm	4	4	□ Exercises □ Assignments	
ILO6	Sorting algorithm Selection sort Bubble sort Insertion sort Quick sort	2	2	□ Exercises □ Assignments	
ILO7	Array Linked list Double linked list Stack Queue	2	2	□ Exercises □ Assignments	

6- Assessment Criteria (Related to ILOs)

ISC	Interactive Synchronized Collaboration		Ex	Exams		Rpt	Reports
PF2F	Presentations and Face-to-Face Assessments		PW	Practice Work			

ILO Code	ILO	Intended Results	Assessment Type				
			ISC	PW	Ex	PF2F	Rpt
ILO1	Algorithm design		√	□	√		□
ILO2	Algorithm analysis		√	□	√		□
ILO3	Divide and conquer problem solving strategy and recursive algorithm		√	□	√		□
ILO4	Geometrical application of recursion		√	□	√		□
ILO5	Backtracking problem solving strategy		√	□	√		□
ILO6	Sorting algorithm		√	□	√		□
ILO7	Linear data structures		√	□	√		□

7-Practice Tools:

Tool Name	Description
Course Name	Personal computer

8-Main References

Algorithm and data structure Dr. Rakan Razzouq Damascus university

9-Additional References

Thomas H. Cormen, Introduction to Algorithms, MIT Press