

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

**Computing Department, Community College Dammam
University of Dammam**

**Course Specifications
(CS)**

Data Structures

CS230

Data Structures

Course Specifications

Institution: University of Damman	Date of Report
College/Department: Dammam-Community College / Computer Science Department	

A. Course Identification and General Information

1. Course title and code: Data Structures (CS230)			
2. Credit hours: 3 (2 Theoretical + 2 Practical)			
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Information systems track			
4. Name of faculty member responsible for the course			
5. Level/year at which this course is offered: 2 nd Level - Year 1			
6. Pre-requisites for this course (if any): CS110			
7. Co-requisites for this course (if any):			
8. Location if not on main campus			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="%70"/>
b. Blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
c. e-learning	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="%30"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. Other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments:			

B Objectives

<p>1. What is the main purpose for this course?</p> <p>The student will be able to:</p> <ol style="list-style-type: none"> 1. Dealing with functions 2. How to represent the data by using the trees, stacks, and queues 3. Using the arrays and functions in software application 4. Apply the systems of the data structures (queue, stack, tree 5. The student uses one of the languages developed in the practical application
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)</p>

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

Teach the student to the abstract data types and data structures and the foundations of the basic analysis of algorithms		
1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
1. Design and analysis of algorithms.	1	2T + 2P
2. Basic data types	1	2 T + 2P
3. Internal representation of data <ul style="list-style-type: none"> • Structures • Indicators • Trees • Queues. • Stacks. • Pointers 	2	4 T + 4P
4. Basic operations on sets	1	2 T + 2P
5. Advanced set representation methods	1	2 T + 2P
6. Directed graphs	1	2 T + 2P
7. Undirected graphs	1	2 T + 2P
8. Sorting: bubble sort, heap sort, quick sort	1	2 T + 2P
9. Searching: sequential search, binary search	1	2 T + 2P
10. Algorithm analysis techniques	1	2 T + 2P
11. Algorithm design techniques	1	2 T + 2P
12. Data structures and algorithms for external storages	1	2 T + 2P
13. Dealing with files	1	2 T + 2P
14. Memory management	1	2 T + 2P

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30			30		60
Credit	30			15		45
3. Additional private study/learning hours expected for students per week.						4
4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy						

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Demonstrate an understanding of the basics of data structures.	Lectures, Class discussions	Assignment, Major exam
1.2	Describe the functionality of a data structure as an abstract data type;		
2.0	Cognitive Skills		
2.1	Apply physical data structure concepts to the implementation of abstract data types.	Lectures, Class discussions	- Assignment, Lab Activity, Major exam
2.2	Apply data structures to solve practical problems		
3.0	Interpersonal Skills & Responsibility		
3.1	Design and implement abstract data types using static or dynamic implementation	Lectures, Presentations	Assignment, Major exam
3.2	Analyze, evaluate and choose the appropriate abstract data types and algorithms to solve particular problem		
4.0	Communication, Information Technology, Numerical		
4.1	Present ideas in an appropriate manner	Lectures, Presentations	Student's Presentation, Major Examination
4.2	Work effectively as individual and team player.		
5.0	Psychomotor		
5.1	N/A	N/A	N/A
5.2			

5. Course Learning Outcomes Mapping Matrix	
Identify on the table below the Course Outcomes and Relationship to PLOs	
Course Learning Outcomes	Program Learning Outcomes
1. Knowledge	
1.1	1.1
1.2	1.2
2. Cognitive skills	
2.1	2.3
2.2	2.1 , 2.2
3. Interpersonal Skills and responsibility	
3.1	3.1, 3.2
3.2	3.3
4. Communication IT and Numeral Skills	
4.1	4.2, 4.3
4.2	4.1
5. Psychomotor Skills	
5.1	N/A

6. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Mid-term	8	%20
2	Project	12	%10
3	Lab	13	%20
4	Attendance/Participation	All weeks	%10
5	Final	17	%40

D. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- Each group of students is assigned to a member of staff who will be available for help and academic guidance office hours at specific 2 hours on daily basis.

E. Learning Resources

1. List Required Textbooks

- Simon Gray, Data Structures in Java, Addison Wesley, 2006.

2. List Essential References Materials (Journals, Reports, etc.)

- Mark A. Weiss, Data Structures and Algorithm Analysis in C++ , Addison Wesley; 3rd Edition, 2006.
- Robert Lafore, Data Structures and Algorithms in Java, Sams; 2nd Edition, 2002.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- Blackboard

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

- CDs accompanied with the text book, power point lectures and essential references

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
<p>1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)</p> <p>Classrooms:</p> <ul style="list-style-type: none"> Furnished with a large central table or multiple small tables that can be grouped into one central table Designed for up to 25 students Size the room allowing 1sq meter per seat <p>Laboratories:</p> <p>25 PC's (one for each students)</p>
<p>2. Computing resources (AV, data show, Smart Board, software, etc.)</p> <ul style="list-style-type: none"> Smart Board, projector, internet, and whiteboard.
<p>3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)</p> <ul style="list-style-type: none"> No

G Course Evaluation and Improvement Processes

<p>1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:</p> <ul style="list-style-type: none"> Student questionnaires to be assessed by independent body. Assessment of course teaching strategies by independent body.
<p>2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor:</p> <ul style="list-style-type: none"> Student questionnaires to be assessed by department.
<p>3 Processes for Improvement of Teaching:</p> <ul style="list-style-type: none"> Attending workshop, reading books, and the searching for e-resources. Revision of course contents, course specifications, and strategies every 5 years.
<p>4 Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)</p> <ul style="list-style-type: none"> Check marking by an independent member of staff of a sample of student work. Periodic exchange and remarking of a sample of assignments with a member of staff in another institution

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Reviewing student's feedback.
- Update text books.
- Consulting other top universities course specifications and contents.