ATTACHMENT 5.

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

T6. Course Specifications (CS)

Data Structures

14012401-3

Course Specifications

Institution	Umm Al Qura University	Date	April 14, 2016
College/Department	College of Computer and Information Systems		

A. Course Identification and General Information

1. Course title and code: 14012401-3 Data Structures
2. Credit hours 3
3. Program(s) in which the course is offered. Computer Science (If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course Curriculum Committee
5. Level/year at which this course is offered 2nd Year / Level 5
6. Pre-requisites for this course (if any) 14011102-4 Object Oriented Programming 14011802-3 Discrete Structures II
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	✓	What percentage?	100
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course? The objective of this course is to provide theoretical and practical knowledge of fundamental computer science structures. Topics include arrays, linked-list, stacks, queues, trees, graphs, and traversal techniques such as depth-first-search and breadth-first-search. These data structures are explained using basic sorting and searching techniques with brief overview of recursion and memory management. The course also explores the implementation of a range of data structures in the Java programming language. The knowledge and practice of these structures are of utmost importance. It will make the students able to organize, represent and manipulate the data, which is central to computing.
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) Developed by increased use of IT and wed based reference materials. Improvements are as a result of new research in the field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: Topics include arrays, linked-list, stacks, queues, trees, graphs, and traversal techniques such as depth-first-search and breadth-first-search. These data structures are explained using basic sorting and searching techniques with brief overview of recursion and memory management. The course also explores the implementation of a range of data structures in the Java programming language.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Arrays and Linked List	3	2
Stacks and Queues	3	2
Trees and Traversals	3	2
Graphs	2	2
Traversal	2	2
Recursion and Memory Management	2	2

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	30		30			60
Credit	1.8		1.2			3

3. Additional private study/learning hours expected for students per week.	3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	Understanding fundamental data structures such as: Arrays, Linked-Lists, Stack, Queues, Trees and Graphs	Lectures	Quizzes, Midterm, Final Exam
1.2	Java based implementations of fundamental data structures	Lab Practicals	Lab Exam
2.0	**Cognitive Skills**		
2.1	Designing (new) data structure to solve selected problems	Lectures, Lab Practical	Lab Assignments, Final Exam
3.0	**Interpersonal Skills & Responsibility**		
3.1			
4.0	**Communication, Information Technology, Numerical**		
4.1			
5.0	**Psychomotor**		

5.1			

5. Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.) (I = Introduction P = Proficient A = Advanced)

Course LOs #	Program Learning Outcomes (Use Program LO Code #s provided in the Program Specifications)										
	1.1	**1.2**	**1.3**	**1.4**	**2.1**	**2.2**	**2.3**	**3.1**	**3.2**	**4.1**	**4.2**
1.1		I	I	I							
1.2		I	I	I							
2.1					P						

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	Lab Task Completion and Assignments	2-6	5%
2	Class Quiz	7	5%
3	Midterm	9	25%
4	Lab Task Completion and Assignments	10-14	5%
5	Class Quiz	15	5%
6	Lab Exam	17	15%
7	Final Exam	18	40%

D. Student Academic Counseling and Support

1. 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)

Office hours between 2-4 hours per week.

E Learning Resources

1. List Required Textbooks Data Structures and Algorithms in Java by Michael T. Goodrich, Roberto Tamassia (latest edition)
2. List Essential References Materials (Journals, Reports, etc.) Data Structures and Algorithm Analysis in Java by Mark A. Weiss (latest edition)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

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.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Lecture room (max 30 students) with Multimedia Projector Computer lab (max 15 students) with Multimedia Projector
2. Computing resources (AV, data show, Smart Board, software, etc.) Java Development Environment and IDE such as Net Beans/Eclipse
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Student feedback forms distributed at the end of the course.
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department
3 Processes for Improvement of Teaching
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)
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Course Instructor _____

Program Coordinator:_____

Signature: _____ Date Received: _____