Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
الـهيئــة الوطنيــة للتقـويـم
والاعـتـمــاد الأكـاديـمــي

ATTACHMENT 5.

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The National Commission for Academic Accreditation & Assessment

T6. Course Specifications
(CS)

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Course Specifications

Institution Umm Al Qura University	Date 14-April-2016

College/Department College of Computers and Information Systems

A. Course Identification and General Information

1. Course title and code: 14012402-4 Algorithms

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 Level 6
6. Pre-requisites for this course (if any) 14012401-3 Data Structures
7. Co-requisites for this course (if any)
8. Location if not on main campus   Al-Abidiyah campus (Boys) and Al-Zaher campus (Girls), Makkah Al Mukarramah

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:

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B Objectives

1. What is the main purpose for this course? The main purpose of this course is to introduce the classic algorithms in various domains, and techniques for designing efficient algorithms. Students will be able to practice their skills on many well-known algorithms and data structures designed to solve real-life problems.	

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)   Students are given programming assignments to test the space and time complexity of various algorithms.

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

Course Description: The objective of this course is to study design and analysis of algorithms. Learning different algorithms design strategies such as divide and conquer, dynamic programming, and greedy approach. Applications involve: sorting and searching, trees/graph, geometric algorithms, and string matching algorithms. Analysis of algorithms is essential part of this course. Study worst case, average case, and amortized analysis- with an emphasis on the close connection between the time complexity of an algorithm and the underlying data structures.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Basic Concepts in Algorithmic Analysis	3	9
Searching & Sorting	2	6
Recurrence Relations and Recursion	2	6
Divide and Conquer	2	6
Dynamic Programming	2	6
Greedy Approach	2	6
String matching	2	6

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total

Kingdom of Saudi Arabia
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والاعـتـمــاد الأكـاديـمــي

Contact Hours	45	0	45			90
Credit	3	0	1			4

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	The students will be able to understand various categories of algorithms such as divide and conquer, dynamic programming, and greedy approach	Teaching using boards, PowerPoint slides, Lab sessions, selected home works, and projects relevant to content of the acquired knowledge	A combination of quizzes, exams, assignments, projects, etc.
1.2	The students will be able to design and implement efficient algorithms such as sorting and searching, string matching, etc.	Teaching using boards, PowerPoint slides, Lab sessions, selected home works, and projects relevant to content of the acquired knowledge	A combination of quizzes, exams, assignments, projects, etc.
1.3	The students will be able to compare the efficiency of various algorithms and to choose the most appropriate ones for a given application	Teaching using boards, PowerPoint slides, Lab sessions, selected home works, and projects relevant to content of the acquired knowledge	A combination of quizzes, exams, assignments, projects, etc.
2.0	**Cognitive Skills**		
2.1			
2.2			

T6._Course Specifications_1 Feb 2015

Kingdom of Saudi Arabia
National Commission for
Academic Accreditation & Assessment

المملكــة العربيــة السعوديــة
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3.0	Interpersonal Skills & Responsibility		
3.1			
3.2			
4.0	Communication, Information Technology, Numerical		
4.1	The students will be able to design and implement efficient algorithms such as sorting and searching, string matching, etc.	Teaching using boards, PowerPoint slides, Lab sessions, selected home works, and projects relevant to content of the acquired knowledge	A combination of quizzes, exams, assignments, projects, etc.
4.2			
5.0	Psychomotor		
5.1	The students will be able to design and implement efficient algorithms such as sorting and searching, string matching, etc.	Lab. demonstrations Co-operative learning	Lab. exams In-lab. evaluation
5.2			

5. Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)												
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	5.1
1.1			P	P								
1.2	I	P			I							
1.3	I	I	I		I							
4.1			P	P								
5.1												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	Attendance & class participation	1-15	5%
2	Quiz 1	3	10%

Kingdom of Saudi Arabia
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3	Quiz 2	5	10%
4	Quiz 3	9	10%
5	Midterm	7	20%
6	Labs	2-13	10%
7	Final exam	16	35%
8			

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)

Faculty member has at least 6 hours per week. In addition to that appointment by email is also available.

E Learning Resources

1. List Required Textbooks
Algorithms: Design Techniques and Analysis by M. H. Alsuwaiyel (latest edition)

2. List Essential References Materials (Journals, Reports, etc.)
Introduction to Algorithms by Thomas H. Cormen and Charles E. Leiserson (latest edition)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
Algorithms by Robert Sedgewick and Kevin Wayne

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
http://www.journals.elsevier.com/journal-of-discrete-algorithms/
http://talg.acm.org/

T6._Course Specifications_1 Feb 2015

Kingdom of Saudi Arabia
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المملكــة العربيــة السعوديــة
الـهيئــة الوطنيــة للتقويـم
والاعـتـمــاد الأكـاديـمــي

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.
MATLAB
C/C++ Compiler
Java SDK

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) Computer lab (max 15 students)
2. Computing resources (AV, data show, Smart Board, software, etc.) C/C++ and Java Development Environments APIs and IDEs
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) No

G   Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Student Survey
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department

T6._Course Specifications_1 Feb 2015

Kingdom of Saudi Arabia
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المملكــة العربيــة السعوديــة
الهيئــة الوطنيــة للتقويــم
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University Course and Instructor Survey

3 Processes for Improvement of Teaching

Review of curriculum and course. Coordination of instructors to improve the teaching quality.

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)

Course file review

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

There are curriculum committee and course committee to review the course effectiveness.

Name of Instructor: Murtaza Ali Khan

Signature: *Murtaza Ali Khan*   Date Report Completed: 15-April-2016

Name of Course Instructor Murtaza Ali Khan

Program Coordinator: _____

Signature: _____   Date Received: _____