ATTACHMENT 5.

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

T6. Course Specifications (CS)

Course Specifications

Institution Umm Al Qura University	Date April16, 2016
College/Department College of Computers and Information Systems	

A. Course Identification and General Information

1. Course title and code: 14014803-3 Theory of Computing
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: 4th year / (level 9 or 10)
6. Pre-requisites for this course (if any): 14011802-3 Discrete Structures II
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:

B Objectives

1. What is the main purpose for this course? Presents the key concepts of theory of computation. Discusses automata and their relationship to regular, context-free and phrase-structure languages. The computability theory is presented, including Turing machines, and decidability. This field addresses mathematical laws that lead towards an efficient computation, govern to design computational models for any of the real-world problems. Its applications are not only in the field of computer science/engineering, but take their part to solve problems in applied mathematics, natural, life and social sciences, as well.
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: Presents the key concepts of theory of computation. Discusses automata and their relationship to regular, context-free and phrase-structure languages. The computability theory is presented, including Turing machines, and decidability.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Finite Automata (DFA)	2	2
Non deterministic automata (NFA), Equivalence with DFA	2	2
Regular expression, Regular languages, Equivalence with DFA	2	2
Nonregular languages, Pumping Lemma	2	2
Context-free Grammar and Languages	2	2
Pushdown Automata (PDA)	2	2
Equivalence of PDA and CFG	1	2
Turing machines	1	2
Decidability and complexity	1	2

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	45					45
Credit	3					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	Students will learn basics of finite automata as a modeling tool of computational problems.	Lectures	Quizzes, Homework, Midterm and Final Exam
1.2	Learn context-free languages and their limitations.	Lectures	Quizzes, Homework, Midterm and Final Exam
1.3	Understand the basis of theory of computation, in particular the role of key problems in defining classes of equivalent problems from a computational perspective.	Lectures	Quizzes, Homework, Midterm and Final Exam
1.4	Understand the limitations of computational procedures.	Lectures	Quizzes, Homework, Midterm and Final Exam
2.0	**Cognitive Skills**		
2.1			
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**	**f**	**g**	**h**	**i**	**j**	**k**
1.1	I	I									
1.2	I	I		P							
1.3	I	I			P						
1.4				P	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	Homework 1, 2, 3 and 4	2, 5, 10, 13	15%
2	Quiz 1, 2, 3 and 4	4, 7, 12, 14	15%
3	Midterm	9	30%
4	Final	17	40%
5			

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 An Introduction to Formal Languages and Automata 2006 by Peter Linz
2. List Essential References Materials (Journals, Reports, etc.)
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 40 students) Multimedia Projector
2. Computing resources (AV, data show, Smart Board, software, etc.)
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: _____