

**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	7/7/1437
College/Department	College of Computers and Information Systems		

### A. Course Identification and General Information

1. Course title and code: 14012203-4 Operating Systems			
2. Credit hours: 4			
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Computer Science			
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): 14032205-4 Computer Organization and Architecture 14011102-4 Object Oriented Programming			
7. Co-requisites for this course (if any): None			
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	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="100"/>
b. blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
c. e-learning	<input type="checkbox"/>	What percentage?	<input type="text"/>
d. correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments:			

## B Objectives

### 1. What is the main purpose for this course?

An operating system defines an abstraction of hardware behavior with which programmers can control the hardware. It also manages resource sharing among the computer's users. The topics in this area explain the issues that influence the design of contemporary operating systems. Courses that cover this area will typically include a laboratory component to enable students to experiment with operating systems.

1. Explain the objectives and functions of modern operating systems.
2. Understand the main principles and techniques used to implement processes and threads, inter-process communication, CPU scheduling, process synchronization, and algorithms for process scheduling
3. Understand virtual memory abstractions in operating systems.
4. Have an understanding of disk organization and file system structure.

### 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)

1. Increase the use of the latest Web-based reference material and textbooks.
2. Review and update the course materials as part of preparation to teach this course.
3. Gather students' opinions about their success in achieving course objectives by the end of the semester. This is done through number of survey questions that map one-to-one with course objectives.

Review and indicate which assessment instrument(s) to be used for assessing each course outcome, and what grading rubric will be used for each instrument.

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

### Course Description:

This course provides an introduction to operating system design and implementation. It covers the major components of most operating systems, in particular process and thread management, CPU scheduling, process synchronization, deadlocks, memory management (segmentation, paging, swapping), virtual memory and file systems.

### 1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Introduction to Operating Systems	1	3
Process and thread management	2	3
CPU scheduling	2	3
Process Synchronization	2	3

Deadlocks	2	3
Memory management	2	3
Virtual Memory	2	3
File system	2	3

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

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	30	0	30	0	0	60
Credit	3	0	1	0	0	4

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

4
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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
<b>1.0</b>	<b>Knowledge</b>		
1.1	Explain the objectives and functions of modern operating systems.	Lectures	Quiz, assignment evaluation
1.2	Understand the main principles and techniques used to implement processes and threads, inter-process communication, CPU scheduling, process synchronization, and algorithms for process scheduling	Lectures, tutorial, labs, assignments	Quiz, lab evaluation, projects, assignment evaluation
1.3	Understand virtual memory abstractions in operating systems.	Lectures, tutorial, labs, assignments	Quiz, lab evaluation, projects, assignment evaluation
1.4	Have an understanding of disk organization and file system structure.	Lectures, tutorial, labs, assignments	Quiz, lab evaluation, projects, assignment evaluation
<b>2.0</b>	<b>Cognitive Skills</b>		

2.1			
2.2			
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1			
3.2			
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1			
4.2			
<b>5.0</b>	<b>Psychomotor</b>		
5.1			
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.) (I = Introduction P = Proficient A = Advanced)

Course LOs #	Program Learning Outcomes (Use Program LO Code #s provided in the Program Specifications)					
	1.2	2.1	2.3	3.1	5.1	5.2
1.1	I	I	I		I	I
1.2	A	A	A	A	A	A
1.3	A	A	A	A	A	A
1.4	P	P	P	A	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	Assignment 1	4	10
2	Assignment 2	12	10
2	Quiz 1	3	5
3	Quiz 2	11	5
4	Group Project	14	20
5	Midterm	10	20
6	Final	16	30

#### 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

Operating System Concepts, by Abraham Silberschatz, Peter Baer Galvin, and Greg Gagne, Eighth Edition, John Wiley & Sons, 2009. ISBN: 978-0-470-12872-5.

Operating Systems: Internals and Design Principles, by William Stallings, Seventh Edition, Prentice Hall, 2011. ISBN 978-0-13-230998-1.

#### 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.

[The main textbook CD](#)

### 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 \(max 40 students\)](#)

[Computer lab \(max 20 students\)](#)

[Overhead projector and internet connection](#)

2. Computing resources (AV, data show, Smart Board, software, etc.) Virtual machine that runs Linux operating system. Integrated Development Environment (e.g., NetBeans, Eclipse, JBuilder). Java Development Kit (JDK)
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 A student-feedback form is 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.

The course materials will be regularly reviewed by the course instructor and the curriculum committee in order to keep it updated.

Name of Instructor: \_\_\_\_\_

Signature: \_\_\_\_\_ Date Report Completed: \_\_\_\_\_

Name of Course Instructor \_\_\_\_\_

Program Coordinator: \_\_\_\_\_

Signature: \_\_\_\_\_ Date Received: \_\_\_\_\_