Course Specifications

Course Title:	Operating Systems
Course Code:	**BSC2370**
Program:	**Computer Science**
Department:	**Computer Science**
College:	**Hekma School of Engineering, Computing, and Informatics**
Institution:	**Dar Al-Hekma University**

Table of Contents

A. Course Identification

1. Credit hours:	
2. Course type	
a. University ☐ College ☑ Department ☐ Others ☐	
b. Required ☑ Elective ☐	
3. Level/year at which this course is offered:	
4. Pre-requisites for this course (if any)**: : BSCS 1320 Computer Architecture and Organization**	
5. Co-requisites for this course (if any)**: NA**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	45
2	Laboratory/Studio	15
3	Tutorial	
4	Others (specify)	
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces several types of operating systems (OS), including networked, client-server, distributed operating systems, and their roles, purpose, and functionalities. It also focuses on operating systems design and implementation issues: system security; synchronization and communication mechanisms; process implementation, management, scheduling, and protection; virtual machines; memory organization and management, involving virtual memory; and I/O device management, secondary storage, and file systems.

2. Course Main Objective

Understand the principles of modern operating system

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	**Demonstrate Understanding on the principle of operating systems types, purposes, and functionalities**	1
1.2	Identify the security issues of operating systems such as integrity, confidentiality and availability.	1
1.3	Describe memory management strategies and techniques	1
1...		
2	**Skills :**	
2.1	**Apply the concepts of processes and threads in programs**	2
2.2	Analyze the efficiency of process management	1
2.3	Determine the performance implications of various I/O buffering alternatives	2
2.4	**Use several techniques to solve issues with concurrency (Dekker, Peterson, semaphores)**	2
2.5	**Evaluate the different memory organizations and their management including virtual memory and secondary storage.**	2
2.6	**Assess security issues of operating systems.**	2
3	**Values:**	
3.1	**Work effectively in a team to implement OS algorithms**	5
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Course Introduction& Review of computer architecture	4
2	**Operating System Principle**	8
3	Processes and State Model	12
4	Scheduling and Dispatching	8
5	Mutual Exclusion and Synchronization	12
6	Memory Management	4
7	IO Management and Disk Operation	4
8	Operating System Security	8
Total		60

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.1	Demonstrate understanding on the principle of operating systems types, purposes, and functionalities	Lecture	Quiz, Midterm, Lab
1.2	Identify the security issues of operating systems such as integrity, confidentiality and availability.	Lecture	Quiz, Midterm
1.3	Analyze the efficiency of process management	Lecture	Midterm, Final exam
1.4	Describe memory management strategies and techniques	Lecture	Quiz, Final exam
1.5	Assess security issues of operating systems.	Lecture	Quiz, Final Exam
2.0	**Skills**		
2.1	Use several techniques to resolve issues with concurrency (Dekker, Peterson, semaphores)	Lecture	Lab report, Quiz, Final Exam
2.2	Apply the concepts of processes and threads in programs	Lecture	Lab report, Quiz, Final Exam
2.3	Determine the performance implications of various I/O buffering alternatives	Lecture	Quiz, Final Exam
3.0	**Values**		
3.1	Work effectively in a team to implement OS algorithms	Lecture	Lab report
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Lab report	1-15	20%
2	Quizzes	6,8,10	10%
3	Assignments	5,11	20%
4	Midterm	12	20%
5	Final	15	30%
6			
7			
8			

Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	William Stallings (2018). Operating Systems: Internals and Design Principles, Global Edition, 9/E. Pearson ISBN: 9781292214290
Essential References Materials	Arpaci-Dusseau, R. H., & Arpaci-Dusseau, A. C. (2014). Operating systems: Three easy pieces. Madison: Arpaci-Dusseau Books
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	
Technology Resources (AV, data show, Smart Board, software, etc.)	
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	6
Reference No.	6
Date	20/05/2021