T-104
2022

Course Specification

Course Specification

Course Title: **Operating System**	
Course Code: **2313 CIS**	
Program: **Information Systems**	
Department: **NA**	
College: **Applied College**	
Institution: **King Khalid University**	
Version: **1**	
Last Revision Date: **6 August 2023**	

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3				
2. Course type					
a.	University ☐	College ☒	Department☐	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered:		3rd Level			

4. Course general Description:

This course is designed to provide students with an overview of Operating Systems basic concepts. This course covers introduction & evolution of Operating System; Operating system structures, process management, CPU scheduling, Memory management, distributed system and security.

5. Pre-requirements for this course (if any): 1301CIS

6. Co- requirements for this course (if any):

7. Course Main Objective(s):
- This course will give Introduction to Operating systems and features
- Provide concepts of OS structures, types of operating systems, services and functions
- Describes the concepts of scheduling, process management and memory management.
- Overview of distributed operating system and operating system security

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	64	100
2.	E-learning		
3.	Hybrid • Traditional classroom • E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	32
2.	Laboratory/Studio	32
3.	Field	
4.	Tutorial	

5.	Others (specify)	4	
	Total		64

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Describe the general structure of an operating system and its functions.	k1	Lectures + Lab	Exams, Assignments, Quizzes
1.2	Define Process and their different states during programs execution.	k1	Lectures + Lab	Exams, Assignments, Quizzes
1.3	Describe process synchronization, mutual exclusion and deadlocks.	k2	Lectures + Lab	Exams, Assignments, Quizzes
1.4	Describe the major CPU scheduling techniques and scheduling applications.	k2		
2.0	Skills			
2.1	Apply new OS techniques and features.	s1	Lectures + Lab	Exams, Assignments, Quizzes
2.2	Explain memory management and security techniques.	s2	Lectures, Lab, group discussion	Exams, Assignments, Quizzes
2.3	Apply shell scripting in OS.	s3	Lectures, Lab, group discussion	Exams, Lab Assignments, Quizzes
3.0	Values, autonomy, and responsibility			
3.1	Solve problems relevant to operating systems and systems programming.	v1	Lectures, Lab, Case Study	Exams, Assignments and presentation
3.2	Communicate with others as part of a group and zeal to update knowledge.	v2 v3	Lab	Exams, Assignments and presentation

C. Course Content

No	List of Topics	Contact Hours
1	**Introduction to Operating System**, Mainframe Systems, Desktop Systems, Multiprocessor Systems, Distributed Systems, Real-Time Systems, Handheld Systems	**4**

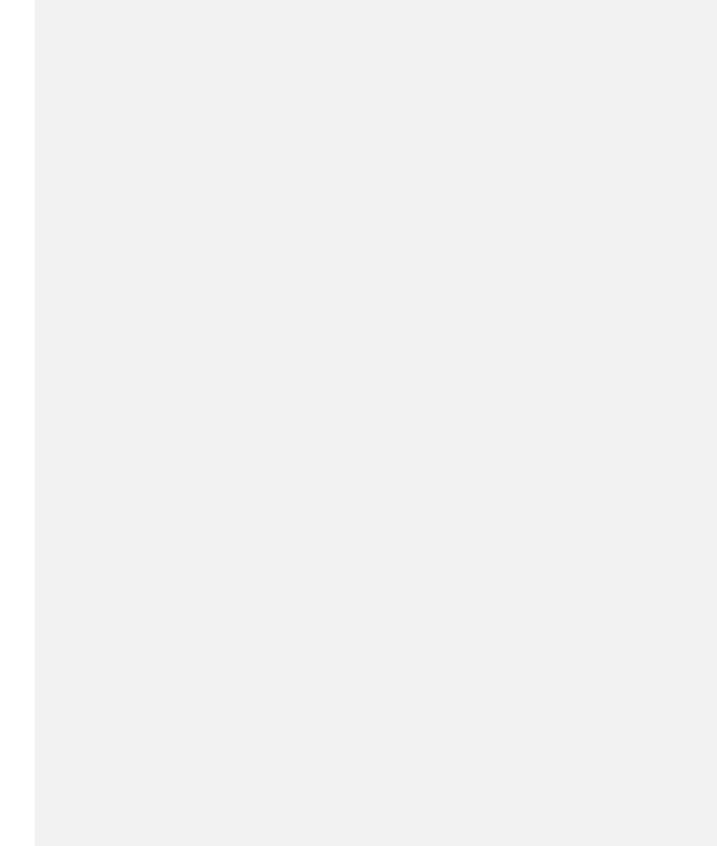| 2	Operating System Structures: System Components-Process, Memory, File and Secondary Storage Managements-Operating-System Services, Systems Calls- System Structure-Simple Structure, Layered Approach, Microkernel	4
3	**Process Management**: Process Concepts-The Process, Process State, PCB, Threads, Process Scheduling-Queues, Scheduler, Context Switch, Operations on Process-Creation & Termination. Threads: Overview, Multithreading Models, Threading Issues	4
4	**CPU Scheduling:** Basic Concepts, Scheduling Criteria, Scheduling Algorithms	3
5	**Process Synchronization:** Background, The Critical Section Problem, Semaphores, Classical Synchronization Problems, Monitors	4
6	**Deadlocks:** System Models, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock	4
7	**Distributed System Structures:** Advantages of distributed systems, Types of Distributed Operating System, Topology, Communication, Naming and Name Resolution, Routing Strategies, Packet Strategies, Communication protocol	4
8	**Security**: Protection, Authentication, Various Security Threats and Handling Methods.	3
9	**Course Review**	2
10	**Lab Topics**	32
Total		64

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz 1	4	5
2.	Midterm Exam 1	7	10
3.	Practical Assessment	1 to 16	30
4.	Midterm Exam 2	12	10
5.	Quiz 2	14	5
6.	Final Exam	After week 16	40

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities
1. References and Learning Resources

Essential References	Operating System Concepts, 8th Edition, Silberschatz, Galvin, Gagne
Supportive References	Modern Operating Systems, 3rd Edition, Andrew S. Tanenbaum, Prentice Hall Operating System in Depth, Thomas W. Doeppner, Wiley, ISBN-9780471687238
Electronic Materials	Students should be regular visitors of different websites of institutions and must have close observation on the computer based technology. . www.en.wikipedia.org/wiki/Operating_system . www.webopedia.com/TERlWo/operating_system.html
Other Learning Materials	All other materials will be made available via course's Blackboard page

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	• Lecture Room with enough capacity Chairs Projector/Screen. • Laboratories with Computers
Technology equipment (projector, smart board, software)	• Laboratories computers with internet connection. • Projectors, Computer for Theory Classes and Practical Sessions.
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Course Teacher	Direct
Quality of learning resources	Program Supervisor, Quality Unit	Direct
The extent to which CLOs have been achieved	Course Teacher	Direct
Other	Course Teacher, Quality Unit	Direct

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	