



T-104
2022

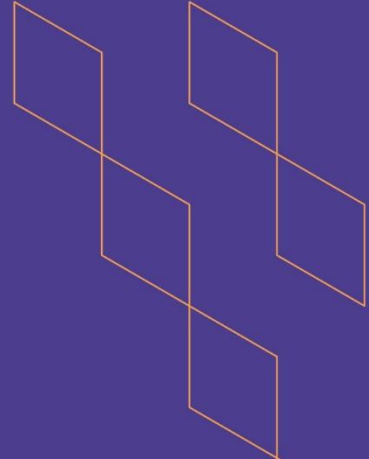
Course Specification





T-104
2022

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 |



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A. General information about the course:

| Course Identification | |
|--|--|
| 1. Credit hours: | |
| 2. Course type | |
| a. | University <input type="checkbox"/> College <input checked="" type="checkbox"/> Department <input type="checkbox"/> Track <input type="checkbox"/> Others <input type="checkbox"/> |
| b. | Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/> |
| 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): | |
| <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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) | |
| | 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 |





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|--------------|--|-----------|
| 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. Doepfner, 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/TERIWo/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.) | <ul style="list-style-type: none"> Lecture Room with enough capacity Chairs Projector/Screen. Laboratories with Computers |
| Technology equipment (projector, smart board, software) | <ul style="list-style-type: none"> 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 | |

