هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title:	**Operating Systems**
Course Code:	IT10502
Program:	**Information Technology**
Department:	**Information Technology**
College:	**Faculty of Computer Science and Information Technology**
Institution:	**Albaha University**
Version:	**version1**
Last Revision Date:	**05 - 04 – 2023**

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A. General information about the course:

Course Identification					
1. Credit hours:	3 H				
2. Course type					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered:	Fifth level / second year				
4. Course general Description Lecture: This is a first course in operating system theory and design. After successfully completing this course, students understand the core concepts of operating systems, such as processes and threads, scheduling, synchronization, memory management, file systems, input and output device management and security. Lab: The lab of this course implements concepts learned in operating system course using Linux (Ubantu) operating system. The labs of this course provide opportunity to students to hands-on experience y on Linux operating systems by learning, its installation, shell commands and scripting.					
5. Pre-requirements for this course (if any): Introduction to Computing and Algorithms CS10002					
6. Co- requirements for this course (if any):					
7. Course Main Objective(s) Upon successful completion of the course, the student will be able to: • Describe the concept of operating system and its structure • Describe process management, including processes, threads, synchronization, scheduling and deadlocks. • Describe memory management, including main memory and virtual memory. • Define storage management, including mass-storage, file system and I/O system. • Define protection and security. • Operate across different operating systems environment. • Demonstrate hands-on expertise on Linux operating system. • Practice on covered topics by solving given assignments periodically. • Communicate concepts and techniques in participation and presentations.					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	44	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	22
2.	Laboratory/Studio	22
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	44

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 fundamental concepts of process management, memory management, Storage management and inter-process communication in operating system.	K2	Lectures Multimedia Presentation Discussions/debates Practice Exercises	Assignments Quizzes Midterm exam Final exam
2.0	Skills			
2.1	Explain storage management, including mass storage, file system and I/O system	S2	Demonstrations Labs Lectures Group Discussion Group Projects Case Studies	Homework/Assignments Quizzes Midterm Exam Final Exam Lab exercises Lab exams Project Assessment Report Assessment
2.2	Discuss protection and security	S4	Demonstrations Debates/Discussions Labs Lectures Group Discussion Group Projects Case Studies	Homework/Assignments Quizzes Midterm Exam Final Exam Lab exercises Project Assessment Report Assessment
2.3	Compare across different operating systems environment	S5	Demonstrations Debates/Discussions Labs Lectures Group Discussion Group Projects Case Studies	Homework/Assignments Final Exam Lab exercises Lab exams Project Assessment Report Assessment
2.4	Implement hands-on expertise on Linux operating system information and	S6	Demonstrations Labs Lectures Group Projects	Lab exercises Lab exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	concepts in oral presentations and class discussions.		Case Studies Practical Exercises	Project Assessment Report Assessment
2.5	Communicate concepts and techniques in oral presentations	S6	Slide Presentations Multimedia Presentations Demonstrations Debates/Discussions Group Projects	Presentation Assessment
3.0	Values, autonomy, and responsibility			
3.1	Work both independently and collaboratively	V1	Presentation Debates/Discussions Group Projects Team-based Learning Case Studies Seminars	Presentation Assessment

C. Course Content

No	List of Topics	Contact Hours
1.	History of operating systems	2
2.	Introduction, an overview of operating systems	2
3.	Operating systems concepts and structure	2
4.	Processes	2
5.	Threads	2
6.	CPU Scheduling	2
7.	Synchronization (Semaphores)	2
8.	Synchronization (Deadlocks)	1
9.	Memory management	1
10.	Main memory	1
11.	File systems	1
12.	Mass-storage systems	1
13.	I/O Systems	1
14.	Multi-Processor systems	1
15.	Security and protection	1
Total		22

No	List of Topics (LAB)	Contact Hours
1	Linux/Ubantu Installation and Introduction to Linux	3
2.	Basic Linux shell commands	1
3.	More Linux shell commands and examples	2
4.	Basic scrip building	3
5.	Using structured commands in shell scripting	1
6.	More structured commands in shell scripting	2
7.	Advanced shell scripting, creating functions	2
8.	TCSH: Process system calls	3
9.	TCSH: I/O system calls	1
10.	TCSH: Process scheduling	3
11.	TCSH: Memory Management	1
Total		22

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework Assignments	Week 4, 8, 10	5%
2.	Midterm Exam	6th week	15%
3.	Quiz	10th week	15%
	Oral presentations and participation	12th week	5%
4	Lab Continuous Evaluation	Every Two Weeks	10%
	Lab Final Evaluation	12th week	10%
5	Final Exam	13th week	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	Abraham Silberschatz et al., Operating Systems Concepts (10th edition), Wiley, 2018.
Supportive References	1. William Stallings, Operating Systems: Internals and Design Principles (7th edition), Pearson , 2011. 2. Thomas W. Doeppner, Operating Systems in depth, Wiley, 2010
Electronic Materials	Access to the Saudi Digital Library (SDL). • Using the learning management system of the university – Rafid System (https://lms.bu.edu.sa/). • ACM (Association for Computer Machinery) web site - http://www.acm.org/ • ACM SIGCSE (Special Interest Group on Computer Science Education) resource web site - http://www.sigcse.org/SIGresources • IEEE Computer Society web site - http://www.computer.org/portal/web/guest/home • Intel *The Journey Inside* web site (has a collection of interactive, online lessons about technology, computers, and society) - http://educate.intel.com/en/TheJourneyInside/ • *Google Code University* Curriculum Resource web site - http://code.google.com/edu/resources/index.html
Other Learning Materials	Ubuntu Linux (Required) 2. Windows 10 (Optional) 3. MAC OS (Optional)

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	A classroom or lecture hall with whiteboard. • A laboratory with computers that have installed Windows, MAC OSX, and Linux • An instructor computer station with · High speed Internet connection; · A desktop computer with system administration software installed; · Power outlets for instructor's laptop plug-in; · A digital image projection system with connection and switches to desktop computer, laptop computer

Items	Resources
	and DVD/Blu Ray player.
Technology equipment (projector, smart board, software)	All students shall have · A computer with Microsoft Project © software installed; This software comes with the textbook. · High speed Internet connection; · Power outlets for student's laptop plug-in.
Other equipment (depending on the nature of the specialty)	A laboratory with multiple computers/servers, with a variety of operating systems: · Windows · Linux · Mac OSX - A whole IT infrastructure

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students Peer Reviewer Program Leader	Indirect: Survey Direct: Peer Review Direct: Class Visits
Effectiveness of students assessment	Exams Evaluation Committee Students	Direct: Exam Review Indirect: Survey
Quality of learning resources	Faculty	Direct: Exams
The extent to which CLOs have been achieved	Jodah Platform	Electronic
Other		

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

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	05 – 4 – 2023