

ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

**Course Specifications
(CS)**

Course Specifications

Institution Najran University	Date of Report
College/Department : Faculty of Art and Science /Computer Science Department	

A. Course Identification and General Information

1. Course title and code: Title: Operating Systems Code: 506CS-3 (٥٠٦ع-٣)			
2. Credit hours : (3)			
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Computer Science Program			
4. Name of faculty member responsible for the course Dr: Ahmed Abdu Alattab			
5. Level/year at which this course is offered: level 5 / Third Year			
6. Pre-requisites for this course (if any) 404CS-3 (Data Structures)			
7. Co-requisites for this course (if any) Non			
8. Location if not on main campus main campus			
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:			
We still teach this course using traditional methods in but there is a plan to transform all course into electronic format using E-learning			

B Objectives

1. What is the main purpose for this course?
1) Understand the basic concepts of operating systems and how the basic operating system model works. 2) Use the proper tools to explain the principle of operating system 3) Understand the basic concepts of Operating-System Structures
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)

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

Introduction to the main topics of operating systems; processes, threads, inter-process communication, process scheduling, process synchronization, deadlocks, memory management and virtual memory, file systems - interface and implementation, mass-storage structure and management, input/output systems.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Introduction What Operating Systems Do Computer-System Organization Computer-System Architecture Operating-System Operations	1	2
Operating-System Structures Operating-System Services User Operating-System Interface System Calls Types of System Calls	1	2
System Programs Operating-System Design and Implementation Operating-System Structure Virtual Machines System Boot	1	2
Process Management Process Scheduling Operations on Processes Inter-process Communication Examples of IPC Systems	2	4
CPU Scheduling Scheduling Criteria Scheduling Algorithms Thread Scheduling	2	4

Process Synchronization The Critical-Section Problem Peterson's Solution Synchronization Hardware Semaphores	2	4
Deadlock Deadlock Characterization Methods for Handling Deadlocks Deadlock Prevention Deadlock Avoidance Deadlock Detection	2	4
Memory Management Swapping Contiguous Memory Allocation Paging Structure of the Page Table	2	4
Storage Management File Management file management system, file organization and access, file directories, Secondary storage management).	1	2
I/O management I/O management and disk scheduling (I/O devices, organization of I/O function, I/O buffering, disk I/O),	1	2

1. Topics to be Covered in Lab		
List of Topics	No. of Weeks	Contact Hours
MS-DOS Commends <ul style="list-style-type: none"> System Commends TIME – DATA – MEM – CLS – VER – MODE – DEFRAG – PROMPT	4	8
<ul style="list-style-type: none"> Disk Commends (VOL – FORMAT – LABEL – DISKCOPY – CHKDSK – UNFORMAT)		
<ul style="list-style-type: none"> Folders Commends (DIR – CD – MD – RD – TREE – DELTREE)		

(COPY CON – EDIT – TYPE – REN – COPY – DEL – UNDELET – ATTRIB – XCOPY – MOVE) -		
<u>Operating System Windows</u> Introduction to Operating System Windows <ul style="list-style-type: none"> • Folders and Files Commands 	5	10
<ul style="list-style-type: none"> • System and Disk Commands 		
System tools : Disk cleanup Disk defragments System information System restores Task scheduler		
<ul style="list-style-type: none"> • Disk Formatting And Partitioning 		
<ul style="list-style-type: none"> • System Boot Process 		
Using assembly/C++ language write programs for the following : <ol style="list-style-type: none"> 1. Create folder Delete folder Rename folder 2. Create file Delete file Rename file Search file Read file Change date and time 3. CPU scheduling algorithms 4. Process Synchronization algorithms 5. The Critical-Section Problem algorithm 6. Peterson's solution algorithm 7. The Bounded-Buffer Problem 8. The Readers-Writers Problem 9. The Dining-Philosophers Problem 10. Producer-Consumer Problem 	5	10

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30		30			60
Credit	30		15			45

3. Additional private study/learning hours expected for students per week.	2 hours
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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The *National Qualification Framework* provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

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. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Remember the basics and principles of operating systems	Lecture Discussion and dialogue	Achievement test
1.2	Recall basic knowledge and theory of operating system.	Lecture Discussion and dialogue Problem Solving Laboratory method	Achievement test

2.0	Cognitive Skills		
2.1	Develop experimental programs related to algorithm of operating system, and justify the obtained result.	Lecture Discussion and dialogue Problem Solving Laboratory method	Achievement test
2.2	Explain the working principle of operating systems using proper tools		
2.3			
3.0	Interpersonal Skills & Responsibility		
3.1			
3.2			
4.0	Communication, Information Technology, Numerical		
4.1			
4.2			
5.0	Psychomotor		
5.1			

Suggested Guidelines for Learning Outcome Verb, Assessment, and Teaching

NQF Learning Domains	Suggested Verbs
Knowledge	list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write
Cognitive Skills	estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict, justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise
Interpersonal Skills & Responsibility	demonstrate, judge, choose, illustrate, modify, show, use, appraise, evaluate, justify, analyze, question, and write
Communication, Information Technology, Numerical	demonstrate, calculate, illustrate, interpret, research, question, operate, appraise, evaluate, assess, and criticize
Psychomotor	demonstrate, show, illustrate, perform, dramatize, employ, manipulate, operate, prepare, produce, draw, diagram, examine, construct, assemble, experiment, and reconstruct

Suggested **verbs not to use** when writing measurable and assessable learning outcomes are as follows:

Consider	Maximize	Continue	Review	Ensure	Enlarge	Understand
Maintain	Reflect	Examine	Strengthen	Explore	Encourage	Deepen

Some of these verbs can be used if tied to specific actions or quantification.

Suggested assessment methods and teaching strategies are:

According to research and best practices, multiple and continuous assessment methods are required to verify student learning. Current trends incorporate a wide range of rubric assessment tools; including web-based student performance systems that apply rubrics, benchmarks, KPIs, and analysis. Rubrics are especially helpful for qualitative evaluation. Differentiated assessment strategies include: exams, portfolios, long and short essays, log books, analytical reports, individual and group presentations, posters, journals, case studies, lab manuals, video analysis, group reports, lab reports, debates, speeches, learning logs, peer evaluations, self-evaluations, videos, graphs, dramatic performances, tables, demonstrations, graphic organizers, discussion forums, interviews, learning contracts, antidotal notes, artwork, KWL charts, and concept mapping.

Differentiated teaching strategies should be selected to align with the curriculum taught, the needs of students, and the intended learning outcomes. Teaching methods include: lecture, debate, small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, guest speakers, memorization, humor, individual presentation, brainstorming, and a wide variety of hands-on student learning activities.

5. 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	Mid-term exam	8	20
2	Quizzes and Assignments	During the semester	10
3	Mid-Term Lab Exam	10	10
4	Final Lab Exam	15	10
5	Final Exam	At the end of semester	40
6	Attendance	During the semester	10

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)

E. Learning Resources

1. List Required Textbooks Operating System Concepts , by Abraham Silberschatz , 8nd Edition ISBN-13: 978-1118063330 ISBN-10: 1118063333 Edition: 9 th
2. List Essential References Materials (Journals, Reports, etc.)
3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) <ul style="list-style-type: none"> Andrew S. Tanenbaum (1987), Operating Systems: Design and implementation, Prentice-Hall, ISBN 0136373313 William stalling ,2012 “ operating systems , internals and designprinciples “ seven edition ,prentice hall . Douglas Comer (1984), Operating System Design: The Xinu Approach, Prentice-Hall, ISBN 0136375545 Douglas Comer (1987), Operating System Design — Volume 2: Internetworking with Xinu, Prentice-Hall, ISBN 0136376460 Pat Villani (1996), FreeDOS Kernel, RD Books, ISBN 0879304367 Richard A. Burgess (1995), Developing your own 32-bit operating system, Sams, ISBN 0672306557 Jean J. Labrosse (1999), Micro-C/OS-II: The real-time kernel, Miller-Freeman, ISBN 0879305436
4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)
5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

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.) Classrooms for 20-30 students with data show Laboratories 20-30 students

2. Computing resources (AV, data show, Smart Board, software, etc.)
Classrooms Should include data show and also laboratories
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
None

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:
✓ distribution of a questionnaire for students to know how to achieve the goals in the theoretical and practical side.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor:
✓ Discussions with colleagues who specialize in teaching methods and means of learning.
✓ Self-evaluation of the performance of the teacher.
✓ Discussions with other colleagues who taught this course.
3 Processes for Improvement of Teaching
✓ Diagnose weaknesses and turn them into strengths.
✓ Discussions about the decision and methods of teaching
✓ Study the needs of the labor market of college graduates
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.

Faculty or Teaching Staff: Dr. Ahmed Abdu Alattab

Signature: _____ Date Report Completed: _____

Received by: _____ Dean/Department Head

Signature: _____ Date: _____