

## **Course Specifications**

**Kingdom of Saudi Arabia**

**The National Commission for Academic Accreditation & Assessment**

**Computing Department, Community College Dammam  
University of Dammam**

**Course Specifications  
(CS)**

**Operating Systems**

**CS330**

# Operating Systems

## Course Specifications

<b>Institution:</b> University of Dammam	<b>Date of Report</b>
<b>College/Department:</b> Dammam-Community College / Computer Science Department	

### A. Course Identification and General Information

1. Course title and code: Operating Systems (CS330)			
2. Credit hours: 3 (2 Theoretical + 2 Practical)			
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Computer Science and Information technology tracks			
4. Name of faculty member responsible for the course			
5. Level/year at which this course is offered: 3 <sup>rd</sup> Level / Year 2			
6. Pre-requisites for this course (if any): None			
7. Co-requisites for this course (if any):			
8. Location if not on main campus			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="%70"/>
b. Blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
c. E-learning	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="%30"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. Other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments:			

## B. Objectives

1. What is the main purpose for this course?
<ol style="list-style-type: none"> <li>1. Understand the basic concepts underlying operating systems and how a typical operating system works.</li> <li>2. Describe the functions and design of operating systems.</li> <li>3. Understand the main concept behind traditional (non-distributed) operating systems.</li> <li>4. Analyze and explain the Algorithms used in Virtual Memory Management.</li> <li>5. Discuss the algorithms used in I/O and File Management.</li> </ol>
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)

This course is a general introduction to the design and implementation of modern operating systems. An operating system such as Windows, Linux, or Mac OS X is a fundamental part of any computing system. It is responsible for managing all the running processes as well as allowing the processes to safely share system resources such as the hard drive and network. So, the student will study the basic concepts of operating systems (OS) and will learn how it works.

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
The following concepts will be studied in this course:		
1. OS overview (objectives, functions, evolution of OS, characteristics of modern OS)	1	2T + 2P
2. Process description and control (process definition, process states, process description and process control)	1	2 T + 2P
3. Threads (definition, why use thread, relationship between processes and threads)	1	2 T + 2P
4. Microkernel (benefits of microkernel organization, microkernel design)	1	2 T + 2P
5. Uni-processor scheduling (types of scheduling, short term scheduling criteria, scheduling algorithms)	1	2 T + 2P
6. Memory management (memory management requirements, loading programs into main memory -fixed partitioning, dynamic partitioning, simple paging, simple segmentation-)	2	4T + 4P
7. Virtual memory (paging, segmentation, combined paging and segmentation)	2	4T + 4P
8. Operating system software (fetch policy, placement policy, replacement policy, resident set management, cleaning policy, load control)	2	4 T + 4P
9. I/O management and disk scheduling (I/O devices, organization of I/O function, I/O buffering, disk I/O)	2	4 T + 4P

10. File management (file management system, file organization and access, file directories, secondary storage management).	2	4 T + 4P
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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.

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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
1.1	Demonstrate an understanding on the principles of operating systems ,design and implementations.	Lecture with discussion Independent learning tasks Library searches real life modeling	Board work Seatwork Assignment Major Exams
1.2	Understand the various components and functions of an operating system.		
<b>2.0</b>	<b>Cognitive Skills</b>		
2.1	Apply suitable Process Scheduling Algorithm and Memory Partition Techniques	Lecture with discussion Independent learning tasks Library searches	Board work Seatwork Assignment Major Exams
2.2	Apply appropriate techniques to avoid control problems such as mutual exclusion and deadlocks		
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	Compare appropriate process scheduling , memory management algorithm and CPU scheduling techniques.	Question and answer, Discussion, and independent study	Board work Seatwork Assignment Major Exams Problem Solving project
3.2	Implement and evaluate operating system components in Windows and Unix environments.		
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1	Present ideas in appropriate manner.	Question and answer Discussion, and independent study	Board work Seatwork Assignment Major Exams
4.2	Work effectively as an individual and team player		

<b>5.0</b>	<b>Psychomotor</b>		
5.1	N/A	N/A	N/A
5.2			

<b>5.Course Learning Outcomes Mapping Matrix</b>	
Identify on the table below the Course Outcomes and Relationship to PLOs	
Course Learning Outcomes	Program Learning Outcomes
<b>1. Knowledge</b>	
1.1	1.1
1.2	1.2
<b>2. Cognitive skills</b>	
2.1	2.3
2.2	2.1 , 2.2
<b>3. Interpersonal Skills and responsibility</b>	
3.1	3.1, 3.2
3.2	3.3
<b>4. Communication IT and Numeral Skills</b>	
4.1	4.2, 4.3
4.2	4.1
<b>5. Psychomotor Skills</b>	
5.1	N/A

<b>6. Schedule of Assessment Tasks for Students During the Semester</b>			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Mid-term	8	%20
2	Project	12	%10
3	Lab	13	%20
4	Attendance/Participation	All weeks	%10
5	Final	17	%40

## 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)

- Each group of students is assigned to a member of staff who will be available for help and academic guidance office hours at specific 2 hours on daily basis.

## E. Learning Resources

1. List Required Textbooks

- W. Stallings, “Operating Systems: Internals and Design Principles”, Prentice Hall International, 5<sup>th</sup> edition 2005, ISBN: 0-13-147954-7

2. List Essential References Materials (Journals, Reports, etc.)

- McKusick and Nevile-Neil, Design and Implementation of the FreeBSD Operating System, Addison Wesley, 2005.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- Blackboard and Social Media

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

- CDs accompanied with the text book, power point lectures and essential references

## 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:

- Furnished with a large central table or multiple small tables that can be grouped into one central table
- Designed for up to 25 students
- Size the room allowing 1sq meter per seat

Laboratories:

25 PC's (one for each students)

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| <p>2. Computing resources (AV, data show, Smart Board, software, etc.)</p> <ul style="list-style-type: none"> <li>• Smart Board, projector, internet, and whiteboard.</li> </ul> |
| <p>3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)</p> <ul style="list-style-type: none"> <li>• No</li> </ul>  |

## G. Course Evaluation and Improvement Processes

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|---|
| <p>1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:</p> <ul style="list-style-type: none"> <li>• Student questionnaires to be assessed by independent body.</li> <li>• Assessment of course teaching strategies by independent body.</li> </ul>  |
| <p>2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor:</p> <ul style="list-style-type: none"> <li>• Student questionnaires to be assessed by department.</li> </ul>   |
| <p>3 Processes for Improvement of Teaching:</p> <ul style="list-style-type: none"> <li>• Attending workshop, reading books, and the searching for e-resources.</li> <li>• Revision of course contents, course specifications, and strategies every 5 years.</li> </ul>  |
| <p>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)</p> <ul style="list-style-type: none"> <li>• Check marking by an independent member of staff of a sample of student work.</li> <li>• Periodic exchange and remarking of a sample of assignments with a member of staff in another institution</li> </ul> |
| <p>5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none"> <li>• Reviewing student's feedback.</li> <li>• Update text books.</li> <li>• Consulting other top universities course specifications and contents.</li> </ul>   |