

**Department Of Computer Science & Information Technology, University Of Sargodha, Sargodha**

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**Course Outline**

<b>Title</b>	<b>Operating System</b>							
<b>Course Code</b>	CS-3621							
<b>Credit Hours</b>	4							
<b>Prerequisite</b>	-							
<b>Prerequisite Skill/Knowledge/Understanding</b>	<b>TEACHING, LEARNING + ASSESSMENT ACTIVITIES</b>			<b>STUDY HOURS</b>				
	32 lectures			48				
	Regular student's Centered learning			96				
	Net Surfing			20				
	In course Assignment(s) + Quiz /Test + Project (practical or writing)			4+10 + 16 = 30				
	Preparation term examination + Project Schema viva			24				
Term examination + final project viva / Presentation			10					
<b>Required Study Hours</b>	32 hours							
<b>Follow Up</b>	-							
<b>Program Name</b>	BSSE							
<b>Category</b>	Core							
<b>Aims and Objectives</b>	This course provides understanding of operating systems through examination of theoretical concepts under ruling various operating Systems components algorithms and techniques used within Operating systems. A hands-on project involving design and Implementation of these components is also covered in the course							
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• To give student knowledge of working various of operating systems</li> <li>• To enable them to understand the fundamental of operating systems</li> <li>• To enable them to understand the various resource management by operating systems</li> <li>• To give concepts of program selection, execution and concurrency</li> </ul>							
<b>Text Book/s</b>	1. Operating System concepts by Silberchatz, Galvin, Gagne, (Eighth Edition)							
<b>Reference Books</b>	1. Applied Operating System Concepts, 6 <sup>th</sup> edition, P.C. 1998 2. Modern Operating Systems, 2 <sup>nd</sup> Edition, Tanenbaum A.S., 2001							
<b>Instructional Aids/Resources</b>	<b>Class Assessment</b>	<b>20%</b>	<b>Mid</b>	<b>30%</b>	<b>Final</b>	<b>50%</b>	<b>Total</b>	<b>100%</b>
	Quizzes and Test	8						
	Assignment and Presentations	9						
	Attendance and Class Participations	3						
<b>Assessment Criteria</b>								

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<b>Policies and Regulations</b>	<p><b>Class Attendance and Absenteeism</b> Students are required to attend all classes and lab meetings. Regular attendance in their class/laboratory sessions will be very helpful to maintain a satisfactory progress throughout their course. Attendance will be strictly enforced and evaluated according to the Student Attendance Control Criteria announced by the DOCSIT and UoS. Any student who exceeds the maximum allowable absence limit during the course will not be allowed to sit in the exams. The maximum allowed limit for this course is 25% which include both excused and unexcused absences.</p> <p><b>Academic Integrity</b> Cheating in any form will not be tolerated and could lead to severe consequences. Academic work submitted by the students in the form of homework, assignment, or a project must be the result of their own effort.</p> <p><b>Make-Up Exam Policy</b> A student who has missed an exam will be allowed to sit in a make-up exam only if he or she provides a medical report from a government hospital/clinic.</p> <p><b>General Behavior</b> Students must maintain a good behavior both in and outside their classes. They are required to keep their mobile phones switched off while attending their class/laboratory sessions or writing their exams. Any student who engages in a behavior that disrupts the learning environment may face disciplinary action under the UoS code. Students must also maintain a smoke free environment in all college facilities.</p>
<b>Recommendations</b>	

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<b>Framework</b>					
<b>Week</b>	<b>Lecture</b>	<b>Topic</b>	<b>Source</b> (Book-Chapter No. Article no.)	<b>Study Hours</b>	<b>Recommendations for Learning Activities</b> (Mention Assignments, Test, Quizzes, Practical, Case Study, Projects, Lab Work or Reading Assignments)
1	1	<b>Introduction:</b> Definitions, Types, OS responsibilities, operations, History: Evolution of OS, Buffering, Spooling, Batch systems	Text Ch-(1) Ref book 1	1.5	N.A.
	2	Multiprogramming, Time Sharing, Multiprocessor Systems: Loosely coupled systems, advantages of multiprocessor systems, types of multiprocessor systems, implementations	Text Ch-(1) Ref book 1	1.5	N.A.
2	3	Desktop Systems, Distributed Systems Real Time Systems, Handheld Systems, Summary	Text Ch 1	1.5	Assignment 1
	4	<b>The Process</b> , Introduction, Process Scheduling, Process Schedulers, Operations on Process	Text Ch 3	1.5	N.A
3	5	Cooperating Processes, Inter process Communication, Techniques for IPCs Summary	Text Ch 3	1.5	N.A
	6	<b>Threads:</b> Overview, advantages, Threading Models, one to one, one to many, many to many	Text Ch 4	1.5	N.A
4	7	Threading Issues, Thread creation and cancellation, Pthreads, Java Threads, Summary	Text Ch 4	1.5	N.A
	8	<b>CPU Scheduling:</b> Scheduling criteria, CPU scheduling algorithms, FCFS, SRF, SJF	Text Ch 5	1.5	N.A
5	9	Priority Scheduling, Round Robin, Virtual Round Robin, Multi-level queues, Multi-level Feed back queues.	Text Ch 5	1.5	Preparation of Pre Mid Test
	10	<b>Process Synchronization:</b> Introduction, Critical Section Problem, Synchronization hardware, Critical Section Problem using Software instruction	Text Ch 6	1.5	N.A
6	11	Critical Section Problem using Software instruction , Semaphores, Classical Critical Section Problems, Producer/ Consumer problem for bounded buffer and unbounded buffer.	Text Ch 6	1.5	Assignment 3
	12	Mid Term			
7	13	Producer/ Consumer problem for bounded buffer and unbounded buffer, Reader Writer Problem with reader priority	Text Ch 6	1.5	Quiz 3

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	14	Reader Writer Problem with writer priority, Critical regions, summary	Text Ch 6	1.5	N.A
8	15	<b>DeadLock:</b> System deadlocks, Deadlock characterization, Resource allocation graph	Text Ch 7	1.5	N.A
	16	Methods for handling deadlock, deadlock prevention, No preemption, circular wait, Deadlock avoidance	Text Ch 7	1.5	N.A
9	17	<b>Memory Management:</b> Background, address bindings, types of address bindings, dynamic loading, dynamic linking, Swapping	Text Ch 8	1.5	N.A
	18	Contagious Memory Allocation, Paging, Page Map Table Implementations	Text Ch 8	1.5	Class Quiz # 1
11	21	Structures of page map tables, Segmentation, Fragmentation issues, Paged Segmentation, Summary	Text Ch 8	1.5	N.A
	22	<b>Virtual Memory :</b> Background, Demand Paging , Process Creation, Page Replacement algorithms	Text Ch 9	1.5	N.A
12	23	Page replacement algorithms : FIFO, LRU, LFU, MFU, LRU, Implantations for LRU	Text Ch 9	1.5	N.A
	24	Page Buffering, Buddy systems, Slab allocation, Threshing	Text Ch 9	1.5	Assignment 2
13	25	Allocation of Frames, Page fault frequency, Other Considerations Summary	Text Ch 9	1.5	Class Quiz # 2
	26	File concept, File types, Access methods,	Text Ch 10	1.5	Assignment 4
14	27	Directory structure, File system mounting, File sharing, Protection	Text Ch 10	1.5	N.A
	28	File system structure, File system implementation, overviews	Text Ch 11	1.5	N.A
16	31	Presentations		1.5	
	32	Presentations		1.5	