

Institute/Department	UNIVERSITY INSTITUTE OF ENGINEERING (UIE)	Program	Bachelor of Engineering - Computer Science & Engineering (CS201)
Master Subject Coordinator Name:	Puneet Kaur	Master Subject Coordinator E-Code:	E6913
Course Name	Operating Systems	Course Code	20CST-313

Lecture	Tutorial	Practical	Self Study	Credit	Subject Type
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Course Type	Course Category	Mode of Assessment	Mode of Delivery
Program Core	Graded (GR)	Theory Examination (ET)	Theory (TH)

Mission of the Department	MD1: To provide practical knowledge using state-of-the-art technological support for the experiential learning of our students. MD2: To provide an industry-recommended curriculum and transparent assessment for quality learning experiences. MD3: To create global linkages for interdisciplinary collaborative learning and research. MD4: To nurture an advanced learning platform for research and innovation for students' profound future growth. MD5: To inculcate leadership qualities and strong ethical values through value-based education.
Vision of the Department	"To be recognized as a leading Computer Science and Engineering department through effective teaching practices and excellence in research and innovation for creating competent professionals with ethics, values, and entrepreneurial attitude to deliver service to society and to meet the current industry standards at the global level."

Program Educational Objectives(PEOs)

PEO1	PEO1 Graduates of the Computer Science and Engineering will contribute to the Nation's growth through their ability to solve diverse and complex computer science and engineering problems across a broad range of application areas. (PEO1 is focused on Problem Solving)
PEO2	PEO2 Graduates of the Computer Science and Engineering will be successful professionals, designing and implementing Products & Services of global standards in the field of Computer Science & Engineering, becoming entrepreneurs, Pursuing higher studies & research. (PEO 2 is focused on Professional Success)
PEO3	PEO3 Graduates of the Computer Science and Engineering Program will be able to adapt to changing scenario of dynamic technology with an ability to solve larger societal problems using logical and flexible approach in decision making. (PEO 3 is focused on Attaining Flexibility and Adaptability)

Program Specific OutComes(PSOs)

PSO1	PSO1 Exhibit attitude for continuous learning and deliver efficient solutions for emerging challenges in the computation domain.
PSO2	PSO2 Apply standard software engineering principles to develop viable solutions for Information Technology Enabled Services (ITES).

Program OutComes(POs)

PO1	PO1 Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2	PO2 Problem analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3	PO3 Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal, and environmental considerations.
PO4	PO4 Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO5	PO5 Modern tool usage: Create, select, and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	PO6 The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7	PO7 Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO8	PO8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	PO9 Individual or teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	PO10 Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
PO11	PO11 Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	PO12 Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context to technological change.

Text Books					
Sr No	Title of the Book	Author Name	Volume/Edition	Publish Hours	Years
1	Operating System Concepts	Galvin, Peter B., Silberchatz, A.	8th	Addison Wesley	-
2	Operating Systems	Flynn	-	Cengage Learning	-
3	Operating System: A Concept Based Approach	Dhamdhare, D.M	-	Tata Mc-Graw-Hill	-

Reference Books					
Sr No	Title of the Book	Author Name	Volume/Edition	Publish Hours	Years
1	Operating System	Madnick , Stuart E., Donovan, John J.	-	McGrawHill	-
2	Operating Systems	Stalling, William	5th	Pearson Education	-

Course OutCome	
SrNo	OutCome
CO1	Explain the structure of the operation system and illustrates the process management mechanism and applications
CO2	Identify and solve the problems of deadlocks
CO3	Student will be able to outline the various features such as memory management, device management and file management of operating system
CO4	Categorize the security threats
CO5	Apply the knowledge of distributed and Network Operating Systems on the complex problems related to computer network

Lecture Plan Preview-Theory						
Unit No	LectureNo	ChapterName	Topic	Text/ Reference Books	Pedagogical Tool**	Mapped with CO Numer (s)
1	1	Introduction to Operating System	Introduction to Operating Systems, Operating System Structure	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO1
1	2	Introduction to Operating System	Main Functions and characteristics of Operating Systems, Types of Operating Systems	,T-Operating System Concepts,R-Operating System	PPT,Simulation,Video Lecture	CO1
1	3	Introduction to Operating System	System calls, Types of system calls, System programs	,T-Operating System Concepts,R-Operating System	PPT,Simulation,Video Lecture	CO1

1	4	Process Management	Process Concept, Process Control Block, Process Scheduling	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO1
1	5	Process Management	Threads, CPU Scheduling : Preemptive/ Non Preemptive Scheduling, Scheduling Criteria, Scheduling Algorithms	,T-Operating Systems,R-Operating Systems	PPT,Video Lecture	CO1
1	6	Process Management	Scheduling Algorithms: FCFS, RR scheduling, SJF Scheduling, Priority Scheduling	,T-Operating Systems,R-Operating System	PPT,Video Lecture	CO1
1	7	Process Management	Scheduling Algorithms: FCFS, RR scheduling, SJF Scheduling, Priority Scheduling	,T-Operating System Concepts,T-Operating Systems,R-Operating Systems	PPT,Video Lecture	CO1
1	8	Process Management	Scheduling Algorithms: FCFS, RR scheduling, SJF Scheduling, Priority Scheduling	,T-Operating Systems,R-Operating Systems	PPT,Video Lecture	CO1
1	9	Process Management	Inter-process communication, remote procedure calls, Process Synchronization	,T-Operating System Concepts,R-Operating Systems	PPT,Video Lecture	CO1
1	10	Deadlocks	Deadlock characterization and conditions for deadlock, deadlock prevention, Deadlock avoidance-safe state	,T-Operating Systems,R-Operating Systems	PPT,Video Lecture	CO2
1	11	Deadlocks	Resource Allocation Graph algorithm	,T-Operating Systems,R-Operating Systems	PPT,Video Lecture	CO2
1	12	Deadlocks	Bankers Algorithm-Safety algorithm	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO2
1	13	Deadlocks	Bankers Algorithm-Safety algorithm (Example)	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO2
1	14	Deadlocks	Deadlock detection, Recovery from deadlock.	,T-Operating System Concepts,R-Operating Systems	PPT,Video Lecture	CO2
1	15	Deadlocks	Deadlock detection, Recovery from deadlock.	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO2
2	16	Memory Management	Address binding, logical versus physical address space, dynamic loading, Swapping	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3
2	17	Memory Management	contiguous memory allocation, Fragmentation, Paging	,T-Operating System Concepts,R-Operating Systems	PPT,Video Lecture	CO3
2	18	Memory Management	Segmentation, Segmentation with Paging	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3
2	19	Memory Management	Virtual Memory Concept, Demand Paging	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3
2	20	Memory Management	Page Replacement, Page Replacement Algorithms. (FIFO, LIFO, LRU, Optimal page replacement algorithm)	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3
2	21	Memory Management	Page Replacement, Page Replacement Algorithms. (FIFO, LIFO, LRU, Optimal page replacement algorithm)	,T-Operating System Concepts,R-Operating Systems	PPT,Video Lecture	CO3
2	22	Memory Management	Page Replacement, Page Replacement Algorithms. (FIFO, LIFO, LRU, Optimal page replacement algorithm)	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3
2	23	Device Management	Disk Structure, Disk formatting, Disk Scheduling Algorithms	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3
2	24	Device Management	Disk Scheduling Algorithms (FCFS,SSTF,SCAN,C-SCAN,LOOK,C-LOOK)	,T-Operating System: A Concept Ba,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3

2	25	Device Management	Disk Scheduling Algorithms (FCFS,SSTF,SCAN,C-SCAN,LOOK,C-LOOK)	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3
2	26	Device Management	Disk Scheduling Algorithms (FCFS,SSTF,SCAN,C-SCAN,LOOK,C-LOOK)	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3
2	27	File Management	File Concepts, Access Methods, Directory Structure	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO4
2	28	File Management	File allocation Methods	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3
2	29	File Management	File allocation Methods	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3
2	30	File Management	Free Space Management	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO3
3	31	System Protection and Security	System Protection and Security: Goals, principles and domain of protection	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO4
3	32	System Protection and Security	Access matrix, implementation of access matrix, the security problem	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO4
3	33	System Protection and Security	Access matrix, implementation of access matrix, the security problem	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO4
3	34	System Protection and Security	program threats, system and network threats.	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO4
3	35	System Protection and Security	program threats, system and network threats.	,T-Operating System: A Concept Ba,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO4
3	36	Distributed and Network Operating Systems	Distributed and Network Operating Systems: Overview: Topology	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO5
3	37	Distributed and Network Operating Systems	Types of Distributed Operating system	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO5
3	38	Distributed and Network Operating Systems	connection strategy	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO5
3	39	Distributed and Network Operating Systems	network operating system types: Peer to Peer & Client server	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO5
3	40	Distributed and Network Operating Systems	Revision	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO1
3	41	Distributed and Network Operating Systems	Proposed Advanced Topic: Study of a distribution of Unix System-BSD	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO5
3	42	Distributed and Network Operating Systems	Proposed Advanced Topic: Study of a Mach System	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO5
3	43	Distributed and Network Operating Systems	Proposed Advanced Topic: Study of various Influential Systems	,T-Operating System Concepts,R-Operating System	PPT,Video Lecture	CO5

3	44	Distributed and Network Operating Systems	Surprise Test	,T-Operating System: A Concept Ba,T-Operating System Concepts,T-Operating Systems,R-Operating System,R-Operating Systems	Video Lecture	CO1
3	45	Distributed and Network Operating Systems	Surprise Test	,T-Operating System: A Concept Ba,T-Operating System Concepts,T-Operating Systems,R-Operating System,R-Operating Systems	Video Lecture	CO1

Assessment Model			
Sr No	Assessment Name	Exam Name	Max Marks
1	20EU01	External Theory	60
2	20EU01	Assignment	10
3	20EU01	Attendance Marks	2
4	20EU01	Mid-Semester Test-1	40
5	20EU01	Quiz	4
6	20EU01	Surprise Test	12
7	20EU01	Mid-Semester Test-2	40

CO vs PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	NA	NA	NA	NA	NA	NA	2	1	NA	NA	NA	NA
CO2	3	3	NA	NA	NA	NA	NA	NA	2	1	NA	NA	NA	NA
CO3	3	NA	NA	3	NA	NA	NA	NA	2	1	NA	3	2	NA
CO4	3	3	NA	NA	NA	NA	NA	NA	2	1	NA	3	NA	NA
CO5	3	NA	3	NA	NA	NA	NA	NA	2	1	NA	3	NA	3
Target	3	3	3	3	NA	NA	NA	NA	2	1	NA	3	2	3

