

1. Name of the Faculty: Alok Jhaldiyal	Course Code:
2. Course : Operating System	L: 3
3. Program : B.Tech. CSE with spcl. CSF	T: 0
4. Target : Level-2	P: 0
	C: 3

COURSE PLAN

Target	50% (marks)
Level-1	40% (population)
Level-2	50% (population)
Level-3	60% (population)

1. Method of Evaluation

UG	PG
Quizzes/Tests, Assignments (30%)	Quizzes/Tests, Assignments, seminar (50%)
Mid Examination (20%)	End semester (50%)
End examination (50%)	

*may be keep as per Program (UG/PG)

2. Passing Criteria

Scale	PG	UG
Out of 10point scale	SGPA – “6.00” in each semester CGPA – “6.00” Min. Individual Course Grade – “C” Course Grade Point – “4.0”	SGPA – “5.0” in each semester CGPA – “5.0” Min. Individual Course Grade – “C” Course Grade Point – “4.0”

*may be keep as per Program (UG/PG)

3. Pedagogy : Discussion-based Learning

4. Topics introduced for the first time in the program through this course

- CPU scheduling
- Memory management
- Disk scheduling
- Deadlocks
- Process synchronization

5. References:

Text Books	Web resources	Journals	Reference books
1. SILBERSCHATZ, Galvin (2010), Operating System Concepts 8e, Wiley India.			1. Garry Nutt, “Operating Systems – A Modern perspective”, Third Edition, Pearson Education.

1. Name of the Faculty: Alok Jhaldiyal
2. Course : Operating System
3. Program : B.Tech. CSE with spcl. CSF
4. Target : Level-2

Course Code:
L: 3
T: 0
P: 0
C: 3

2. William Stallings, “Operating systems”, Pearson Education, Fifth edition. 3. D.M. Dhamdhere, “Operating Systems”, 2nd Edition, Tata McGraw- Hill.			2. Andrew S. Tanenbaum, “Modern Operating Systems”, Prentice Hall. 3. Bach, M.J., “Design of UNIX Operating System”, Prentice Hall. 4. Charles Crowley, “Operating systems – A Design Oriented Approach”, Tata Mc Grawhill, 1997. 5. Michel Palmer “Guide o Operating Systems”, Vikas Thomson Learning Publishing, NewDelhi.
---	--	--	---

Signature of HOD/Dean

Date:

Signature of Faculty

Date:

1. Name of the Faculty:	Alok Jhaldiyal	Course Code:
2. Course	: Operating System	L: 3
3. Program	: B.Tech. CSE with spcl. CSF	T: 0
4. Target	: Level-2	P: 0
		C: 3

GUIDELINES TO STUDY THE SUBJECT

Instructions to Students:

1. Go through the 'Syllabus' in the Black Board section of the web-site(<https://learn.upes.ac.in>) in order to find out the Reading List.
2. Get your schedule and try to pace your studies as close to the timeline as possible.
3. Get your on-line lecture notes (Content, videos) at Lecture Notes section. These are our lecture notes. Make sure you use them during this course.
4. Check your Learning Management System (LMS) regularly.
5. Go through study material
6. Check mails and announcements on LMS
7. Keep updated with the posts, assignments and examinations which shall be conducted on the LMS.
8. Be regular, so that you do not suffer in any way
9. **Cell Phones and other Electronic Communication Devices:** Cell phones and other electronic communication devices (such as Blackberries/Laptops) are not permitted in classes during Tests or the Mid/Final Examination. Such devices MUST be turned off in the class room.
10. **E-Mail and online learning tool:** Each student in the class should have an e-mail id and a pass word to access the LMS system regularly. Regularly, important information – Date of conducting class tests, guest lectures, via online learning tool. The best way to arrange meetings with us or ask specific questions is by email and prior appointment. All the assignments preferably should be uploaded on online learning tool. Various research papers/reference material will be mailed/uploaded on online learning platform time to time.
11. **Attendance:** Students are required to have minimum attendance of 75% in each subject. Students with less than said percentage shall NOT be allowed to appear in the end semester examination.

This much should be enough to get you organized and on your way to having a great semester! If you need us for anything, send your feedback through e-mail nchugh@ddn.upes.ac.in . Please use an appropriate subject line to indicate your message details.

There will no doubt be many more activities in the coming weeks. So, to keep up to date with all the latest developments, please keep visiting this website regularly.

1. Name of the Faculty: Alok Jhaldiyal	Course Code:
2. Course : Operating System	L: 3
3. Program : B.Tech. CSE with spcl. CSF	T: 0
4. Target : Level-2	P: 0
	C: 3

RELATED OUTCOMES

1. The expected outcomes of the Program are:

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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	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	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	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	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	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	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as

- | | |
|---|--------------|
| 1. Name of the Faculty: Alok Jhaldiyal | Course Code: |
| 2. Course : Operating System | L: 3 |
| 3. Program : B.Tech. CSE with spcl. CSF | T: 0 |
| 4. Target : Level-2 | P: 0 |
| | C: 3 |

	a member and leader in a team, to manage projects and in multidisciplinary environments.
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 of technological change.

2. The expected outcomes of the Specific Program are: (upto3)

PSO1	Perform system and application programming using computer system concepts, concepts of Data Structures, algorithm development, problem solving and optimizing techniques.
PSO2	Apply software development and project management methodologies using concepts of front-end and back-end development and emerging technologies and platforms.
PSO3	Apply computing knowledge to assess, design and propose cyber security solutions and perform forensic procedures on digital systems and cyber world using tools and technologies in the area of cyber security and cyber forensics.

3. The expected outcomes of the Course are: (minimum 3 and maximum 6)

CO 1	Explain various types of operating systems and its structure.
CO 2	Apply various process management and CPU scheduling algorithms.
CO 3	Apply various deadlock prevention, avoidance, and detection and recovery techniques.
CO 4	Discuss various memory management techniques.
CO 5	Analyze various disk-scheduling algorithms and file systems.

4. Co-Relationship Matrix

1. Name of the Faculty: Alok Jhaldiyal
2. Course : Operating System
3. Program : B.Tech. CSE with spcl. CSF
4. Target : Level-2

Course Code:
L: 3
T: 0
P: 0
C: 3

Indicate the relationships by 1- Slight (low) 2- Moderate (Medium) 3-Substantial (high)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	2	1	1	2	1						3	
CO2	2	1	2	2	1						3	
CO3	1	2	2	2	1						3	
CO4	2	2	2	2	1						3	
CO5	2		1	3	1						3	
Avg	1.8	1.5	1.6	2.2	1						3	

5. Course outcomes assessment plan:

components Course Outcomes	Assignment	Test/Quiz	Mid Semester	End Semester
CO 1	✓	✓	✓	✓
CO 2	✓	✓	✓	✓
CO 3		✓		✓
CO 4		✓		✓
CO 5		✓		✓

Internal Assessment shall be done based on the following detailed breakup and scheme of assessment:

Assignments	Marks	Percentage
Assignments-2	10*2=20	20%
Class Test- 1	20	20%
Quiz-2	30*2=60	60%
Total	100	100%

SESSION PLAN

1. Name of the Faculty: Alok Jhaldiyal
2. Course : Operating System
3. Program : B.Tech. CSE with spcl. CSF
4. Target : Level-2

Course Code:
 L: 3
 T: 0
 P: 0
 C: 3

Lecture No.	Topics to be Covered	CO Mapped
UNIT-I (Introduction To Operating System)		
1	Introduction to OS	CO1
2	Operating system need and operating system services	CO1
3	Operating system Classification –Single user, Multi user, Simple batch Processing	CO1
UNIT-II (Process Management)		
6	Process Concept	CO2
7	Inter process communication	CO2
8	Race conditions	CO2
9	Critical Sections ,Mutual Exclusion –Busy waiting	CO2
10	Sleep and Wakeup – semaphores. Event counter – Monitors	CO2
11	Message passing, Threads	CO2
12	Process scheduling & CPU scheduling – Round robin scheduling	CO2
13	Process scheduling & CPU scheduling – priority scheduling. Process scheduling & CPU scheduling – SJF.	CO2
14	Multiple queues. Process scheduling & CPU scheduling – guaranteed scheduling-two –level scheduling.	CO2
UNIT-III (Deadlock)		
15	Deadlock - conditions for deadlock.	CO3
16	Deadlock detection and recovery.	CO3
17	Deadlock avoidance - resource trajectories - safe and unsafe states.	CO3

1. Name of the Faculty: Alok Jhaladiyal
2. Course : Operating System
3. Program : B.Tech. CSE with spcl. CSF
4. Target : Level-2

Course Code:
 L: 3
 T: 0
 P: 0
 C: 3

18	Banker's algorithm.	CO3
19	Deadlock prevention.	CO3
20	Two phase locking – non-resource deadlocks –	CO3
21	Starvation, security mechanism and policy.	CO3
22	Domain of protection, access matrix.	CO3
UNIT-IV (Memory Management)		
23	Logical versus Physical Address space. Swapping.	CO4
24	Multiprogramming with fixed partition. Multiprogramming with variable partition.	CO4
25	Memory management with bit maps	CO4
26	Buddy system- allocation of swap space	CO4
27	Virtual memory- paging, page tables	CO4
28	Associative memory, inverted page tables.	CO4
29	Segmentation. Allocation algorithm	CO4
30	Page replacement algorithm, thrashing	CO4
UNIT-V (I/O Management)		
31	File systems and I/O files. (Flip Mode)	CO5
32	Directories- file system implementation	CO5
33	Security and protection mechanisms Principles of I/O hardware – I/O devices. Device controllers-DMA.	CO5
34	I/O buffering –RAID –Disk cache	CO5
35	Disk Scheduling- FCFS scheduling Disk Scheduling- SSTF scheduling ,Disk Scheduling- SCAN Scheduling	CO5

1. Name of the Faculty: Alok Jhaldiyal
2. Course : Operating System
3. Program : B.Tech. CSE with spcl. CSF
4. Target : Level-2

Course Code:

L: 3

T: 0

P: 0

C: 3

36.	Disk Scheduling- C- SCAN scheduling Selecting disk-scheduling algorithms. Case Studies.	CO5
-----	---	-----

Sessions: Total No. of Instructional periods available for the course

Signature of faculty

Date:

5. Name of the Faculty: Dr. Kaushik Ghosh
6. Course : Operating System
7. Program : BCA (IoT and BFSI)
8. Target : 50%

Course Code: CSBC 2003
L: 4
T:
P:
C: 4

INDIRECT ASSESSMENT

Sample format for Indirect Assessment of Course outcomes:

NAME:
<i>ENROLLMENT NO:</i>
SAP ID:
COURSE:
PROGRAM:

Please rate the following aspects of course outcomes of -----.

Use the scale 1-3*

course Outcomes	Statement	1	2	3
CO1				
CO2				
CO3				
CO4				
CO5				
CO6				

*

1

WEAK

2

MODERATE

3

STRONG