

**COURSE FILE**

**Advanced Operating**

**System**

**SEM V**

**2018-2019**



**FR. Conceicao Rodrigues College of Engineering**  
**Department of Computer Engineering**  
**COURSE FILE INDEX**

**SUBJECT: Advanced Operating System**  
**YEAR: 2018-19**  
**SUBJECT CODE: CSDLO5012**  
**FACULTY NAME: Prof. Mahendra Mehra**

**ACADEMIC**

**SEM: V**

1. Time table
2. Syllabus-text books, reference books, online resources
3. Course objectives
4. Course outcomes (level in blooms taxonomy-knowledge, skill, attitude)
5. CO-PO mapping , CO-PSO Mapping
6. CO attainment tools
7. CO attainment targets
8. Lecture plan (lectures, presentations, homework, videos, case study, social media)
9. Lab/assignments/mini-project plan
10. Curriculum gap (topic, action taken, mapped co or po)
11. Content beyond syllabus (topic, action taken, mapped co or po)
12. Guest lecture(invitation letter, attendance, thanks letter)
13. List of experiments
14. List of assignments/quiz/presentations
15. Rubrics for experiment/ assignment/mini project.. Tools used
16. Lab manual
17. Unit test question papers with marking scheme
18. Sample answer sheets for unit test/sample answer script
19. University question papers
20. Mini project list with some sample reports
21. Course exit survey form
22. Result analysis of previous semester (no. Of students appeared, passed, percentage, students > 60%)
23. Co attainment summary
24. Co attainment excel prints
25. Identified strong and weak students on the basis of test/assignment (>90% and <50%)
26. Assistance to weak students with remedial classes (attendance-contents)
27. Student feedback
28. Audit report

- 29. Attendance sheets
- 30. Attendance defaulters till test1/test2
- 31. Lecture notes
- 32. Proof of any claim made in SAR related to your subject like innovation in teaching learning and assignments and other pedagogical methods.(please refer final SAR)

## TIME TABLE

Prof. Mahendra Mehra						With Effect From: 16th July 2018					
	08.45 – 09.45	09.45 – 10.45	10.45 – 11.00	11.00 – 12.00	12.00 – 13.00	13.00 – 13.30	13.30 – 14.30	14.30 – 15.30	15.30 – 16.30	16.30 – 17.30	
<b>Monday</b>			Break	← WT TEC-B →		Lunch Time	AOS TEC				
<b>Tuesday</b>		AOS TEC		← WT TEC-B →			← NTAL BEC-D →		Mentori ng		
<b>Wednesday</b>	AOS TEC								← NTAL BEC-D →		
<b>Thursday</b>		AOS TEC					← NTAL BEC-B →				
<b>Friday</b>							← NTAL BEC-B →				
<b>Saturday</b>											
<b>Total load: 4hrs(Th)+12hrs(Pract)=16hrs+ Mentoring</b>											

# **FR. Conceicao Rodrigues College Of Engineering**

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

**Department of Computer Engineering**

**T.E. (Computer) (semester V) (2018-2019)**

**Course Outcomes & Assessment Plan**

**Subject: Operating Systems (CSDLO5012)**

**Credits-5**

## **Syllabus:**

<b>Module</b>	<b>Unit</b>	<b>Detailed Content</b>
<b>1.</b>		<b>Introduction</b>
		Functions of operating systems, Design approaches: layered, kernel based and virtual machine approach, types of advanced operating systems (NOS, DOS, Multiprocessor OS, Mobile OS, RTOS, Cloud OS)
<b>2</b>		<b>Unix Kernel and File Management</b>
	2.1	System Structure, User Perspective, Architecture of Unix Operating System
	2.2	Buffer cache: Header, Buffer Pool, Retrieving, Reading and Writing Buffer
	2.3	File Representation: inodes: Structure of file Directories, Path conversion to inode, superblock, inode assignment, allocation of disk blocks
<b>3</b>		<b>Unix Process and Memory management</b>
	3.1	Detailed design of Process Structure: Kernel Data structures for process, Structure of Uarea and Process table, Process states and Transitions
	3.2	Context of a Process: Static and Dynamic area of context, Saving the Context Layout of System Memory, Regions, Mapping regions with Process, page table and mapping virtual address to physical address.
<b>4</b>		<b>Distributed Operating system concepts</b>
		Goals, Distributed Computing Models, Hardware Concepts, Software Concepts, Architecture of DOS. Design Issues: Transparency, Flexibility, Scalability, Reliability, Performance, fault tolerance
<b>5</b>		<b>Multiprocessor Operating System</b>
	5.1	Introduction, Basic multiprocessor system architectures, design issues, Threads, Process synchronization: the test and set instruction, the swap instruction, implementation of the process wait

	5.2	Processor scheduling: Issues, Co-scheduling, Smart scheduling, Affinity Based scheduling
6		<b>Real Time Operating Systems and Mobile OS</b>
	6.1	Characteristics of Real Time operating Systems, Classification of Real Time Operating Systems, Scheduling in RTOS: Clock driven: cyclic, Event driven: EDF and rate monotonic scheduling
	6.2	Mobile OS: Architecture, Android OS, iOS, Virtual OS, Cloud OS and their design issues

### Objectives:

1. To understand design issues of Advanced Operating systems.
2. To understand the architecture, kernel and file management of UNIX operating system.
3. To understand basic concepts and need of Distributed operating systems.
4. To understand concepts and working of different advanced Operating systems like Multiprocessor OS, Real time OS, Mobile OS.

**Assessment: Internal Assessment:** Assessment consists of two class tests of 20 marks each. The first class test is to be conducted when approx. 40% syllabus is completed and second class test when additional 40% syllabus is completed. Duration of each test shall be one hour.

### Text Books:

1. The Design of the UNIX Operating System, PHI, by Maurice J. Bach.
2. Distributed Computing 2<sup>nd</sup> Edition, Mahajan and Seema Shah, Oxford.
3. Advanced Concepts in Operating Systems, Mukesh Singhal, Niranjana G Shivaratri.
4. Mobile Computing by Rajkamal, 1<sup>st</sup> edition, Oxford.
5. Real Time Operating System, Jane W.S. Liu, Pearson.

### Reference Books:

1. Andrew S. Tanenbaum and Maarten Van Steen, —Distributed Systems: Principles and Paradigms, 2<sup>nd</sup> edition, Pearson Education.
2. —Real-Time Systems: Theory and Practice, Rajib Mall, Pearson Education India, 2006.

## Course Outcomes:

Upon completion of this course students will be able to:

**CSDLO5012.1:** Demonstrate understanding of design issues of advanced operating systems and compare different types of operating systems. **[B2: Understanding]**

**CSDLO5012.2:** Analyse design aspects and data structures used for different subsystems of Unix OS. **[B3: Analysis]**

**CSDLO5012.3:** Demonstrate understanding of different architectures used in Distributed OS and analyze their design issues. **[B3: Analysis]**

**CSDLO5012.4:** Demonstrate understanding of different architectures used in Multiprocessor OS and analyse the design and data structures and various processor scheduling algorithms. **[B3: Analysis]**

**CSDLO5012.5:** Classify Real Time OS and analyse various real time scheduling algorithms. **[B4: Analysis]**

## Mapping of CO and PO/PSO

Relationship of course outcomes with program outcomes: Indicate 1 (low importance), 2 (Moderate Importance) or 3 (High Importance) in respective mapping cell.

	PO1 (Eng Kno w)	PO2 (Ana lysis)	PO3 (De sign )	PO4 (inve stiga tion)	PO5 (tools )	PO6 (eng g Soci)	PO7 (Env )	PO8 (Eth )	PO9 (ind Team )	PO10 (comm. )	PO1 1 (PM)	PO1 2 (life Long )
CSDLO50 12.1	3									1		
CSDLO50 12.2	3	2								1		
CSDLO50 12.3	3	2								1		
CSDLO50 12.4	3	2								1		
CSDLO50 12.5	3	2								1		
Course To PO	3	2								1		

CO	PSO1	PSO2
CSDLO5012.1	3	
CSDLO5012.2	3	
CSDLO5012.3	3	
CSDLO5012.4	3	
CSDLO5012.5	3	
Course to PSO	3	

### **Justification for CO-PO Mapping**

#### **PO1:**

All COs are mapped to PO1 because engineering graduates will be able to apply the knowledge of mathematics, Operating system and its functionalities to solve engineering problems

#### **PO2:**

CSDLO5012.2 is mapped to PO2 because students will interpret the need for various subsystems under UNIX architecture.

CSDLO5012.3 is mapped to PO2 because students will understand different architectures used in Distributed OS and analyze their design issues.

CSDLO5012.4 is mapped to PO2 because students will show understanding of different architectures used in Multiprocessor OS and analyse the design and data structures and various processor scheduling algorithms used in Multiprocessor operating systems

CSDLO5012.5 is mapped to PO2 because students will Classify Real Time OS and analyse various real time scheduling algorithms.

#### **PO10:**

CSDLO5012.1,2,3,4,5: is mapped to this PO10 because the students will write assignments on the respective topics

#### **PSO1:**

All COs are mapped to PSO1 because the graduates will be able to apply fundamental knowledge of operating system to build solutions for real world problems.

## CO Assessment Plan

<b>CSDLO501</b> <b>2.1</b>	<i>CSDLO5012.1: Demonstrate understanding of design issues of advanced operating systems and compare different types of operating systems.</i>		
<b>Delivery Methods</b>		Black Board, lecture notes and video	
<b>Target</b>		<b>2.5</b>	
Sr.no	CO Assessment Tools	Target (Tool wise)	Weightage
1.	Test 1	60% student score more than 60%	0.3
	Questions	TEST1(Q1 (a,b,c) total 10 marks)	
	Date	Test1(16/08/2018)	
2.	Assignment 1	60% student score more than 70%	0.3
	Date	10/08/2018	
3.	Quiz 1	60% students score more than 60%	0.2
	Date	10/08/2018	
4.	Semester End Exams	60% students score more than 60%	0.2
	Date		
5.	Course Exit Survey	75% student rate above average (4 & 5)	0.2
	Date	16/10/2018	

### CO Assessment Tools:

**CSDLO5012.1: Direct Methods(80%):** Test(1) , Assignment1, Quiz1, Uni\_Exam(TH)

$$\text{CO1dm} = 0.3(\text{T1}) + 0.3\text{A1} + 0.2\text{Q1} + 0.2(\text{UTh})$$

**Indirect Methods(20%):** Course exit survey

$$\text{CO1idm} = \text{Course\_Exit\_Survey}$$

$$\text{CSDLO5012.1} = 0.8 * \text{CO1dm} + 0.2 * \text{CO1idm}$$



<b>CSDLO501</b> <b>2.2</b>	<b>CSDLO5012.2:</b> Analyse design aspects and data structures used for different subsystems of Unix OS. <b>[B3: Analysis]</b>
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<b>Delivery Methods</b>	Black Board, lecture notes and video
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<b>Target</b>	<b>2.5</b>
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Sr.no	CO Assessment Tools	Target (Tool wise)	Weightage
1.	Test 1 & Test 2	60% student score more than 60%	0.3
	Questions	TEST1(Q2 (a,b,c) total 10 marks)	
	Date	Test1(16/08/2018)	
2.	Assignment 2	60% student score more than 70%	0.3
	Date	24/08/2018	
3.	Quiz 2	60% students score more than 60%	0.2
	Date	24/08/2018	
4.	Semester End Exams	60% students score more than 60%	0.2
	Date		
5.	Course Exit Survey	75% student rate above average (4 & 5)	0.2
	Date	16/10/2018	

### **CO Assessment Tools:**

**CSDLO5012.2: Direct Methods(80%):** Test(1) , Assignment2, Quiz2, Uni\_Exam(TH)

$$CO2dm = 0.3(T1) + 0.3A2 + 0.2Q2 + 0.2(UTh)$$

**Indirect Methods(20%):** Course exit survey

$$CO2idm = Course\_Exit\_Survey$$

$$CSDLO5012.2 = 0.8 * CO2dm + 0.2 * CO2idm$$

<b>CSDLO501</b> <b>2.3</b>	<b>CSDLO5012.3:</b> Demonstrate understanding of different architectures used in Distributed OS and analyze their design issues. [ <b>B3: Analysis</b> ]		
<b>Delivery Methods</b>		Black Board, lecture notes and video	
<b>Target</b>		<b>2.5</b>	
<b>Sr.no</b>	<b>CO Assessment Tools</b>	<b>Target (Tool wise)</b>	<b>Weightage</b>
1.	Test 2	60% student score more than 60%	0.3
	Questions	TEST1(Q1 (a,b) total 10 marks)	
	Date		
2.	Assignment 3	60% student score more than 70%	0.3
	Date	10/09/2018	
3.	Quiz 3	60% students score more than 60%	0.2
	Date	24/08/2018	
4.	Semester End Exams	60% students score more than 60%	0.2
	Date		
5.	Course Exit Survey	75% student rate above average (4 & 5)	0.2
	Date	16/10/2018	
<b><u>CO Assessment Tools:</u></b>			
<b><u>CSDLO5012.2:</u></b> Direct Methods(80%): Test(2) , Assignment3, Quiz3, Uni_Exam(TH)			
<b><math>CO3dm = 0.3(T2) + 0.3A3 + 0.2Q3 + 0.2(UTh)</math></b>			
<b>Indirect Methods(20%):</b> Course exit survey			
<b><math>CO3idm = Course\_Exit\_Survey</math></b>			
<b><u><math>CSDLO5012.3 = 0.8*CO3dm + 0.2* CO3idm</math></u></b>			

<b><u>CSDLO501</u></b> <b><u>2.4</u></b>	<b>CSDLO5012.4:</b> Demonstrate understanding of different architectures used in Multiprocessor OS and analyse the design and data structures and various processor scheduling algorithms. <b>[B3: Analysis]</b>		
<b>Delivery Methods</b>		Black Board, lecture notes and video	
<b>Target</b>		<b>2.5</b>	
<b>Sr.no</b>	<b>CO Assessment Tools</b>	<b>Target (Tool wise)</b>	<b>Weightage</b>
1.	Test 2	60% student score more than 60%	0.3
	Questions	TEST2(Q2 (a,b) Total 05 marks)	
	Date		
2.	Assignment 4	60% student score more than 70%	0.3
	Date	24/09/2018	
3.	Quiz 4	60% students score more than 60%	0.2
	Date	24/09/2018	
4.	Semester End Exams	60% students score more than 60%	0.2
	Date		
5.	Course Exit Survey	75% student rate above average (4 & 5)	0.2
	Date	16/10/2018	
<b><u>CO Assessment Tools:</u></b>			
<b><u>CSDLO5012.2: Direct Methods(80%):</u></b> Test(2) , Assignment4, Quiz4, Uni_Exam(TH)			
<b><u>CO4dm = 0.3(T2) + 0.3A4 +0.2Q4+ 0.2(UTh)</u></b>			
<b><u>Indirect Methods(20%):</u></b> Course exit survey			
<b><u>CO4idm =Course_Exit_Survey</u></b>			
<b><u>CSDLO5012.4 = 0.8*CO4dm + 0.2* CO4idm</u></b>			

<b>CSDLO501</b> <b>2.5</b>	<b>CSDLO5012.5: Classify Real Time OS and analyse various real time scheduling algorithms.</b> <b>[B4: Analysis]</b>		
<b>Delivery Methods</b>		Black Board, lecture notes and video	
<b>Target</b>		<b>2.5</b>	
<b>Sr.no</b>	<b>CO Assessment Tools</b>	<b>Target (Tool wise)</b>	<b>Weightage</b>
1.	Test 2	60% student score more than 60%	0.3
	Questions	TEST2(Q3 (a,b) total 05 marks)	
	Date		
2.	Assignment 5	60% student score more than 70%	0.3
	Date	4/10/2018	
3.	Quiz 5	60% students score more than 60%	0.2
	Date	4/10/2018	
4.	Semester End Exams	60% students score more than 60%	0.2
	Date		
5.	Course Exit Survey	75% student rate above average (4 & 5)	0.2
	Date	16/10/2018	
<b><u>CO Assessment Tools:</u></b>			
<b><u>CSDLO5012.2: Direct Methods(80%):</u></b> Test(1) , Assignment2, Quiz2, Uni_Exam(TH)			
<b>CO5dm = 0.3(T2) + 0.3A5 +0.2Q5+ 0.2(UTh)</b>			
<b>Indirect Methods(20%):</b> Course exit survey			
<b>CO5idm =Course_Exit_Survey</b>			
<b><u>CSDLO5012.5 = 0.8*CO5dm + 0.2* CO5idm</u></b>			

## **Course Outcomes Target:**

*Upon completion of this course students will be able to:*

- **CSDLO5012.1:** Demonstrate understanding of design issues of advanced operating systems and compare different types of operating systems. **[B2: Understanding]**

**Target level: 2.5**

- **CSDLO5012.2:** Analyse design aspects and data structures used for different subsystems of Unix OS. **[B3: Analysis]**

**Target level: 2.5**

- **CSDLO5012.3:** Demonstrate understanding of different architectures used in Distributed OS and analyze their design issues. **[B3: Analysis]**

**Target level: 2.5**

- **CSDLO5012.4:** Demonstrate understanding of different architectures used in Multiprocessor OS and analyse the design and data structures and various processor scheduling algorithms. **[B3: Analysis]**

**Target level: 2.5**

- **CSDLO5012.5:** Classify Real Time OS and analyse various real time scheduling algorithms. **[B4: Analysis]**

**Target level: 2.5**

## **Content Beyond Syllabus:**

NO

## **Curriculum Gap:**

**No gap identified**

# **FR. Conceicao Rodrigues College Of Engineering**

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

**Department of Computer Engineering**

**T.E. (Computer) (semester V)**

**(2018-2019)**

**Class : TE Computer**

**Subject Name: Operating System**

**Subject Code: CSDL05012**

<b>Experiment No:</b>	<b>Assignments (1-4)</b>
<b>Title:</b>	
<b>Date of Performance:</b>	
<b>Date of Submission:</b>	
<b>Roll No:</b>	
<b>Name of the Student:</b>	

**Evaluation:**

<b>Sr. No</b>	<b>Rubric</b>	<b>Grade</b>
<b>1</b>	<b>On time Submission (2)</b>	
<b>2</b>	<b>Organization (2)</b>	
<b>3</b>	<b>Level of content(4)</b>	
<b>4</b>	<b>Depth and breadth of discussion (2)</b>	

**Signature of the Teacher:**

## **Rubrics for the Assignments:**

Indicator	Very Poor	Poor	Average	Good	Excellent
<b>On time Submission (2)</b>	Assignment not submitted (0)	More than two session late (0.5)	Two sessions late (1)	One session late (1.5)	Early or on time (2)
<b>Organization (2)</b>	N/A	Very poor readability and not structured (0.5)	Poor readability and somewhat structured (1)	Readable with one or two mistakes and structured (1.5)	Very well written and structured without any mistakes (2)
<b>Level of content (4)</b>	N/A	Major points are omitted / addressed minimally (1)	All major topics are covered, the information is accurate. (2)	Most major and some minor criteria are included. Information is Accurate (3)	All major and minor criteria are covered and are accurate. (4)
<b>Depth and breadth of discussion (2)</b>	N/A	None in evidence; superficial at most (0.5)	Minor points/information may be missing and discussion is minimal (1)	Discussion centers on some of the points and covers them adequately (1.5)	Information is presented in depth and is accurate (2)

## **FR. Conceicao Rodrigues College Of Engineering**

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

**Department of Computer Engineering**

**T.E. (Computer) (semester V)**

**(2018-2019)**

**Lesson Plan: Advanced Operating System**

**Semester V**

**Year: 2018-19**

**Subject Incharge: Prof. Mahendra Mehra**

### **Course Outcomes:**

*Upon completion of this course students will be able to:*

**CSDLO5012.1:** Demonstrate understanding of design issues of advanced operating systems and compare different types of operating systems. **[B2: Understanding]**

**CSDLO5012.2:** Analyse design aspects and data structures used for different subsystems of Unix OS. **[B3: Analysis]**

**CSDLO5012.3:** Demonstrate understanding of different architectures used in Distributed OS and analyze their design issues. **[B3: Analysis]**

**CSDLO5012.4:** Demonstrate understanding of different architectures used in Multiprocessor OS and analyse the design and data structures and various processor scheduling algorithms used in Multiprocessor operating systems. **[B3: Analysis]**

**CSDLO5012.5:** Classify Real Time OS and analyse various real time scheduling algorithms. **[B4: Analysis]**

### **Modes of Content Delivery:**

i	Class Room Teaching	v	Self Learning Online Resources	ix	Industry Visit
ii	Tutorial	vi	Slides	X	Group Discussion
iii	Remedial Coaching	vii	Simulations/Demonstrations	xi	Seminar
iv	Lab Experiment	viii	Expert Lecture	xii	Case Study



Lect. No.	Portion to be covered	Planned date	Actual date	Content Delivery Method
1.	Functions of operating systems	04/07/2018	04/07/2018	i
2.	Design approaches: layered, kernel based	05/07/2018	05/07/2018	i
3.	Design approaches: virtual machine approach	09/07/2018	09/07/2018	i, vi
4.	types of advanced operating systems (NOS, DOS, Multiprocessor OS, Mobile OS, RTOS, Cloud OS)	10/07/2018	10/07/2018	i, iv, x

**Books:**

**Text Books:**

1. The Design of the UNIX Operating System, PHI, by Maurice J. Bach.

**Self Learning Online Resource:**

1. NPTEL VIDEOS
2. ONLINE NOTES(PPTS)

Lect. No.	Portion to be covered	Planned date	Actual date	Content Delivery Method
5.	Unix Kernel and File Management Introduction	11/07/2018	11/07/2018	i
6.	System Structure	12/07/2018	12/07/2018	i, iv
7.	User Perspective	16/07/2018	16/07/2018	i, iv
8.	Architecture of Unix Operating System	17/07/2018	17/07/2018	i, iv

9.	Buffer cache: Header	18/07/2018	18/07/2018	i, x
10.	Buffer Pool	19/07/2018	19/07/2018	i, x
11.	Retrieving data	23/07/2018	23/07/2018	i, x
12.	Reading and Writing Buffer	24/07/2018	24/07/2018	i, x
13.	File Representation: inodes	25/07/2018	25/07/2018	i, iv, x
14.	Structure of file Directories	26/07/2018	26/07/2018	i, iv, x
15.	Path conversion to inode	30/07/2018	30/07/2018	i, iv, x
16.	superblock, inode assignment	31/07/2018	31/07/2018	i, iv, x
17.	allocation of disk blocks	01/08/2018	01/08/2018	i, iv, x

**Books:**

**Text Books:**

1. The Design of the UNIX Operating System, PHI, by Maurice J. Bach.

**Self Learning Online Resource:**

1. NPTEL VIDEOS
2. ONLINE NOTES(PPTS)

Lect. No.	Portion to be covered	Planned date		Content Delivery Method
18.	Unix Process and Memory management :Introduction	02/08/2018	02/08/2018	i
17.	Detailed design of Process Structure	06/08/2018	06/08/2018	i, iv,
18.	Kernel Data structures for process,	07/08/2018	07/08/2018	i, iv,
19.	Structure of Uarea and Process table Process states and Transitions	08/08/2018	08/08/2018	i,

20.	Process states and Transitions	09/08/2018	09/08/2018	
21.	Context of a Process: Static and Dynamic area of context	20/08/2018	20/08/2018	i
22.	Saving the Context Layout of System Memory	21/08/2018	21/08/2018	i
23.	Regions with process,	22/08/2018	22/08/2018	i
24.	Mapping regions with process,	23/08/2018	23/08/2018	i
25.	page table and mapping virtual address to physical address.	27/08/2018	27/08/2018	i, iv

**Books:**

**Text Books:**

1. The Design of the UNIX Operating System, PHI, by Maurice J. Bach.

**Self Learning Online Resource:**

1. NPTEL VIDEOS  
ONLINE NOTES(PPTS)

Lect. No.	Portion to be covered	Planned date	Actual date	Content Delivery Method
26.	Distributed Operating system concepts : Goals,	28/08/2018	28/08/2018	i
21.	Distributed Computing Models	29/08/2018	29/08/2018	i, iv,
22.	Hardware Concepts, Software Concepts	30/08/2018	30/08/2018	i, iv,
23.	Architecture of DOS.	03/09/2018	03/09/2018	i, iv
24.	Design Issues: Transparency, Flexibility, Scalability	04/09/2018	04/09/2018	i, iv

25.	Design Issues : Reliability, Performance, fault tolerance	05/09/2018	05/09/2018	i, iv
<p>Text Book: Distributed Computing 2<sup>nd</sup> Edition, Mahajan and Seema Shah, Oxford. <u>Self Learning Online Resource:</u></p> <p>1. NPTEL VIDEOS ONLINE NOTES(PPTS)</p>				
Lect. No.	Portion to be covered	Planned date	Actual date	Content Delivery Method
26.	Multiprocessor Operating System	06/09/2018	06/09/2018	i, iv
27.	Basic multiprocessor system architectures	10/09/2018	10/09/2018	i, iv
28.	design issues	11/09/2018	11/09/2018	i, iv
29.	Threads,	12/09/2018	12/09/2018	i, iv,
30.	Process synchronization: the test and set instruction, the swap instruction	13/09/2018	13/09/2018	i, iv,
31.	implementation of the process wait	17/09/2018	17/09/2018	i, iv,
32.	Processor scheduling: Issues, Co-scheduling	18/09/2018	18/09/2018	i, iv
33.	Smart scheduling	19/09/2018	19/09/2018	i, iv
34.	Affinity Based scheduling	20/09/2018	20/09/2018	i, iv
<p><b>Text Books:</b> Advanced Concepts in Operating Systems, Mukesh Singhal, Niranjana G Shivaratri.</p> <p><u>Self Learning Online Resource:</u></p> <p>1. NPTEL VIDEOS ONLINE NOTES(PPTS)</p>				

Lect. No.	Portion to be covered	Planned date	Actual date	Content Delivery Method
35.	Characteristics of Real Time operating Systems	27/09/2018	27/09/2018	i, iv
36.	Classification of Real Time Operating Systems,	28/09/2018	28/09/2018	i, iv
37.	Scheduling in RTOS: Clock driven: cyclic,	29/09/2018	29/09/2018	i, iv
38.	Scheduling in RTOS: Event driven: EDF and rate monotonic scheduling	30/09/2018	30/09/2018	i, iv
39.	Mobile OS: Architecture,	01/10/2018	01/10/2018	i, iv
40.	Android OS, iOS, Virtual OS, Cloud OS and their design issues	02/10/2018	02/10/2018	i, iv,x

**Text Books:** Real Time Operating System, Jane W.S. Liu, Pearson.

**Reference book:** Real-Time Systems: Theory and Practice , Rajib Mall, Pearson Education India, 2006.

**Self Learning Online Resource:**

1. NPTEL VIDEOS  
ONLINE NOTES(PPTS)

**FR. Conceicao Rodrigues College Of Engineering**

**Department Of Computer Engineering  
OS Assignment (CSDLO5012) (2018-2019)**

**Assignments**

**Assignment no 1:**

1. Compare and contrast between various types of operating system
2. Explain the concept of virtualization with examples.

**Assignment no 2:**

1. Explain links in UNIX, demonstrate use of links using command line.
2. Explain inode and demonstrate all the UNIX commands to deal with inode.

**Assignment no 3:**

1. Configure Load Balancing with Nginx WEB SERVER on a Linux machine.

**Assignment no 4:**

1. Explain Multiprocessor scheduling algorithms :
  - a. CO-SCHEDULING
  - b. SMART SCHEDULING
  - c. AFFINITY BASED SCHEDULING

**Assignment no 5:**

1. Classify various types of RTOS and mention different scenarios of their usages.

Assignment no	Co mapped	DOA	DOS
1	CO1	15/7/2018	10/8/2018
2	CO2	11/8/2018	24/8/2018
3	CO3	23/8/2018	10/9/2018
4	CO4	11/9/2018	24/9/2018
5	CO5	23/9/2018	04/10/2018

**FR. Conceicao Rodrigues College Of Engineering**

Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50

Computer Engineering Department

**Course Exit Form**

**Operating System**

**(2018 - 2019)**

1. **I am able to** Demonstrate understanding of design issues of advanced operating systems and compare different types of operating systems
  - i. Strongly Agree
  - ii. Agree
  - iii. Neutral
  - iv. Disagree
  - v. Strongly Disagree
  
2. **I am able to** Analyse design aspects and data structures used for different subsystems of Unix OS.
  - i. Strongly Agree
  - ii. Agree
  - iii. Neutral
  - iv. Disagree
  - v. Strongly Disagree
  
3. **I am able to** Demonstrate understanding of different architectures used in Distributed OS and analyze their design issues
  - i. Strongly Agree
  - ii. Agree
  - iii. Neutral
  - iv. Disagree
  - v. Strongly Disagree
  
4. **I am able** Demonstrate understanding of different architectures used in Multiprocessor OS and analyse the design and data structures and various processor scheduling algorithms
  - i. Strongly Agree
  - ii. Agree
  - iii. Neutral
  - iv. Disagree
  - v. Strongly Disagree
  
5. **I am able to** Classify Real Time OS and analyse various real time scheduling algorithms
  - i. Strongly Agree
  - ii. Agree
  - iii. Neutral
  - iv. Disagree
  - v. Strongly Disagree

### Identification of Strong and Weak Students using Test

Test No.	Test Date	No of Students					
		Total Students	Full Marks	>80%	79%>marks>60%	less than 60%	Failed
TEST1	16/08/18	18	0	2	6	10	0
TEST2	12/10/18	18	2	5	4	7	0

Classification: Tool (Test)	Category	ROLLNO.	NAME OF STUDENTS
Strong students	TEST1>=90% AND TEST2>=90%		
Weak Students	<50%	7623	DSOUZA ORVIL HERMAN
		7932	DODHIYA SUNNY DINESH
		7951	MISHRA AAKASH AKLESH

### Identification of Strong and Weak Students using Assignment

Assig. No.	Assig. (Given Date)	No of Students					
		Assig. (Submission Date)	Full Marks	>80%	79%>marks>60%	less than 60%	Failed
1	15/7/18	10/8/18	0	8	10	0	0
2	11/8/18	24/8/18	0	9	9	0	0
3	23/8/18	10/9/18	0	8	10	0	0
4	11/9/18	24/9/18	0	9	9	0	0
5	23/9/18	04/10/18	0	10	9	0	0

Classification: Tool (Assignment)	Category	Name of student
Strong students	All students above 9	none
		none
Weak Students	All students below 6	none
		none
		none

### Strong/ Weak Students Identified and Action taken:

Sr. No	Date	Roll No	Action Planned	Remedial Assignment given
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1	02/10/18	7623	Remedial class	yes
2	02/10/18	7932	Remedial class	yes
3	02/10/18	7951	Remedial class	yes