PG DEPARTMENT OF COMPUTER SCIENCE				*CLASS: I M.Sc.* Computer Science				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours/week**	**CIA**	**Ext**	**Total**
II	Major Core - 4	21P2DMC4	Operating System Concepts	4	5	25	75	100

Nature of Course				
Knowledge and skill	✓		Employability oriented	
Skill oriented			Entrepreneurship oriented	

Course Objectives

1. To understand the fundamental concepts of operating systems and scheduling.
2. To familiar with the concepts of process and process execution.
3. To gain the knowledge on Management of memory and files.
4. To demonstrate the basic concepts of shells in Linux.
5. To apply the concepts of files in Linux.

Unit	Content	Hrs	K-Level	CLO
I	**Introduction**: Evolution of Operating System –Types of Operating system-Different design and Implementation of Operating System – **Processes**: The Process concept – The Operating System view of processes- Operating System services for Process Management-Scheduling-Scheduling Algorithms.	15	Up to K3	1
II	**Inter-process Communication:** Hardware Support for Mutual Exclusion-Classical Problems in Concurrent Programming-Critical Region and Conditional Critical Region- Monitors –Messages-Deadlocks: Reusable and Consumable Resources-Deadlock Prevention-Deadlock Avoidance –Deadlock Detection and Recovery.	15	Up to K4	2
III	**Memory Management**: Contiguous Allocation –Partitioned Memory Allocation-Static- Partitioned Memory Allocation-Dynamic-Segmentation-Non Contiguous Allocation-Paging- Virtual Memory-**File Management**:- Command Language view of File Systems-User's Programmer View of File System- Disk Organization-Operating System View of File Management.	15	Up to K3	3
IV	**Linux Programming:** Getting Started: An Introduction to UNIX, Linux, and GNU - What Is UNIX - What Is Linux- Linux Distributions - Programming Linux: Linux Programs - Text Editors - The C Compiler - Shell Programming: What Is a Shell?- Pipes and Redirection-The Shell as a Programming Language-Shell Syntax.	15	Up to K2	4
V	**Working with Files**: Linux File Structure-Library Functions-The Standard I/O Library-Formatted Input and Output-File and Directory Maintenance-Scanning Directories-Errors-**Managing Text-Based Screens with curses**: Compiling with curses-The Screen-The Keyboard-Windows-Sub windows.	15	Up to K4	5

Books for Study

1. Operating Systems Concepts And Design by Milan Milenkovic, Second Edition, Tata McGraw Hill Publishing Ltd.
2. Beginning Linux Programming by Neil Matthew, Richard Stones 4th Edition Wiley Publishing, Inc.

Chapters

Text Book: 1

Unit I: 1.1, 1.2, 1.3, 1.5, 2.1, 2.3-2.6

Unit II: 3.1, 3.3, 3.4, 3.6, 4.1, 4.2, 4.3, 4.5

Unit III**:** 5.2, 5.3, 5.4, 6.1, 6.2(6.2.1, 6.2.3, 6.2.5, 6.2.6, 6.2.7, 6.2.9, 6.2.10), 7.1- 7.3, 7.5

Text Book: 2

Unit IV: 1, 2

Unit V: 3, 6

Books for Reference

1. Operating System Concepts by Abraham Silberschatz, 8th Edition, Wiley Student Edition 2009
2. Operating system – A Design Oriented Approach by Charles Crowley, McGraw-Hill Education, 2009
3. Linux System Programming by Robert Love, O'Reily, SPD.

Web Resources

1. https://www.crectirypati.com/sites/default/files/lectur_notes/OpertingSystemsLectureNotes.pdf
2. http://www2.cs.uic.edu/~jbell/CourseNotes/OperatingSystems
3. http://www.smartzworld.com/notes/linux-programming-pdf-lp-pdf-notes/

Rationale for Nature of the course

- Help accomplish include managing inputs from users, sending output to the output devices, management of storage spaces and control of peripheral devices.

Activities on Knowledge and Skill

- Case Studies
- Quiz
- Seminar

Pedagogy

Chalk and talk Materials, PPT, Assignment, Seminar, Problem solving, Group discussion, Interaction and Demonstration.

Course Designer(s) Name

1. Mrs. S.Brindha
2. Ms. S.Saranya

Lesson Plan

Unit	Topics to be covered	Hours	Mode
I	Introduction	6	Lecture
	Processes	9	Lecture, GD
II	Hardware Support for Mutual Exclusion	5	Lecture
	Critical Region and Conditional Critical Region	3	Lecture
	Deadlocks	7	Lecture, PPT
III	Contiguous Allocation -Virtual Memory	7	Lecture
	File Management	8	Lecture, Quiz
IV	Getting Started.	2	Lecture
	Programming Linux	2	Lecture, Case Study
	Shell Programming	11	Lecture, GD
V	Linux File Structure	7	Lecture, Assignment
	Text-Based Screens with curses	8	Lecture, PPT

Course Learning Outcomes

On the completion of the course, the students will be able to

CLOs	COURSE LEARNING OUTCOMES	K - Levels
CLO 1	Describe the evolution , types, process concepts of operating system and scheduling	**Up to K3**
CLO 2	Identify the concept of inter-process communication and deadlock	**Up to K4**
CLO 3	Analyze the concepts of memory and file management.	**Up to K3**
CLO 4	Devise the code using basic commands in Linux	**Up to K2**
CLO 5	Design the code to manage files using Linux.	**Up to K4**

Mapping of CLOs with POs

CLOs / POs	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	2	2	1	-	-	-
CLO 2	2	2	2	1	-	-
CLO 3	2	2	2	2	1	1
CLO 4	2	3	3	2	2	2
CLO 5	2	3	3	2	2	1

(3 –Advanced Application, 2 – Intermediate Level, 1- Basic Level)

Continuous Internal Assessment (CIA): 25 Marks

Components	Marks	K Level
Test (Average of two tests) (Conducted for 40 marks and converted into 10 marks)	10	(Refer Next Table)
Assignment	5	K4
Seminar	5	K4
Quiz	5	K4
Total	25	

Learning Outcome Based Education & Assessment (LOBE)

Formative - Blue Print – Model for Operating System Concepts
Articulation Mapping – K Levels with Courses Learning Outcomes (CLOs)

Internal	CLOs	K- Level	Section A		Section B (Either/or Choice)	Section C (Open Choice)
			Short Answers			
			No. of Questions	K- Level		
CIA I	CLO 1	Up to K3	2	K2	2(K3&K3)	2(K3)
	CLO 2	Up to K4	3	K2	2(K4&K4)	1(K3)
CIA II	CLO 3	Up to K3	2	K3	2(K3&K3)	2(K3)
	CLO 4	Up to K2	3	K1	2(K1&K1)	1(K2)
Question Pattern (CIA I & II)	No. of Questions to be asked		5		4	3
	No. of Questions to be answered		5		2	2
	Marks for each question		2		5	10
	Total Marks for each section		**10**		**10**	**20**

- *CLO5 will be allotted for individual Assignment which carries five marks as part of CIA component.*

Distribution of Section-wise Marks with K Levels *

K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	**Total Marks**	% of Marks without choice	Consolidated %
K1	-	-	-	**-**	-	**17**
K2	10	-	-	**10**	16.67	
K3	-	10	30	**40**	66.67	**66**
K4	-	10	-	**10**	16.67	**17**
Total Marks	**10**	**20**	**30**	**60**	**100**	**100**
K Levels	Section A (No Choice)	Section B (Either/or)	Section C (Open Choice)	**Total Marks**	% of Marks without choice	Consolidated
K1	6	10	-	**16**	26.66	**43**
K2	-	-	10	**10**	16.67	
K3	4	10	20	**34**	56.67	**57**
K4	-	-	-	**-**	-	**-**
Total Marks	**10**	**20**	**30**	**60**	**100**	**100**

Learning Outcome Based Education & Assessment (LOBE)
Summative - Blue Print – Model for Operating System Concepts
Articulation Mapping – K Levels with Courses Learning Outcomes (CLOs)

UNIT	**CLOs**	**K- Level**	**Section A**		**Section B**		**Section C (Either/or Choice)**	**Section D (Open Choice)**
			MCQs		**Short Answers**			
			No of Questions	**K - Level**	**No of Questions**	**K – Level**		
1	CLO1	Up to K3	2	K2&K3	1	K2	2(K3&K3)	1(K3)
2	CLO2	Up to K4	2	K3&K4	1	K2	2(K4&K4)	1(K4)
3	CLO3	Up to K3	2	K3&K3	1	K3	2(K2&K2)	1(K3)
4	CLO4	Up to K2	2	K1&K1	1	K1	2(K1&K1)	1(K2)
5	CLO5	Up to K4	2	K2&K4	1	K1	2(K4&K4)	1(K4)
No. of Questions to be asked			10		5		10	5
No. of Questions to be answered			10		5		5	3
Marks for each question			1		2		5	10
Total Marks for each section			10		10		25	30

- K1 – Remembering and recalling facts with specific answers
- K2 – Basic understanding of facts and stating main ideas with general answers
- K3 – Application oriented – Solving Problems
- K4 – Examining, analyzing, presentation and make inferences with evidences

Distribution of Section – wise Marks with K Levels

K Levels	**Section A (No Choice)**	**Section B (No choice)**	**Section C (Either/or)**	**Section D (Open choice)**	**Total Marks**	**% of Marks without choice**	**Consolidated**
K1	2	4	10	-	**16**	13.33	**13%**
K2	2	4	10	10	**26**	21.67	**22%**
K3	4	2	10	20	**36**	30.00	**30%**
K4	2	-	20	20	**42**	35.00	**35%**
Total Marks	10	10	50	50	**120**	100	**100%**