MARIS STELLA COLLEGE (AUTONOMOUS), VIJAYAWADA- 8
(Affiliated to Krishna University, Machilipatnam)
SYLLABUS

Subject: Computer Science **Semester: IV**
Course Title: Operating Systems **Course Code:20CSCCOS43**
No. of Hours: 60 **LTP: 400** **Credits: 3**

Objectives

- To understand the basic components of a computer operating system, and the interactions among the various components.
- To emphasizes various functions of an operating system like memory management, process management, device management, etc.
- To introduce Shell scripting and Android Development Framework.

Course Outcomes

CO1: Relate the basic functions and types of operating system.
CO2: Describe different services of the operating system.
CO3: Analyse process management and scheduling algorithms.
CO4: Correlate various memory concepts.
CO5: Compile LINUX commands on UNIX/LINUX Operating System.

UNIT- I **(12 Hrs.)**

Introduction to Operating Systems:

What is an Operating System? History and Evolution of OS, Objectives and functions, Computer system architecture, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control &Real-time Systems.

UNIT- II **(12 Hrs.)**

Operating System organization:

Processor and User Modes, Kernels, System Calls and System Programs Process, Process models, Process states, Process creation, process termination, Threads, Threading Issues

Process Scheduling Algorithms-Non-Preemptive and Preemptive Scheduling Algorithms.

UNIT III **(12 Hrs.)**

Process Management: Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery.

Concurrent and Dependent Processes, Semaphores, Inter-process Communication; Process Synchronization

UNIT - IV **(12 Hrs.)**

Memory Management: Physical and Virtual Address Space; Memory Allocation Strategies– Fixed and -Variable Partitions, Paging, Segmentation, Virtual Memory.

File Management : Directory Structure, File Operations, File Allocation Methods.

UNIT - V **(12 Hrs.)**

Introduction to Shell Scripting:

What is Shell and various types of Shell, various editors present in Linux, Different modes of operations in vi editor, What is Shell Script, Writing and Executing the Shell script, Shell Variables (user defined and System variables), Pipes and Filters, De cision making in shell scripts(If else, Switch), Loops in Shell, Functions, Utility Programs (cut, paste, join, tr, uniq utilities), Pattern matching Utility(grep)- Programming Exercises.

Co-Curricular Activities

- Assignments on problem solving
- Student presentations and seminars
- Online quizzes

Prescribed Book

1. Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author) (TMH)

Reference Books

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and Greg Gagne (7 thEdition) Wiley India Edition.
2. Operating Systems: Internals and Design Principles by Stallings (Pearson)
3. Online Resources for UNIT V.

MARIS STELLA COLLEGE (AUTONOMOUS), VIJAYAWADA – 8

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Blueprint

Subject: Computer Science **Semester: IV**

Course Title: Operating Systems **Course Code: 20CSCCOS43**

Time: 3 Hrs. **Max. Marks: 100**

SECTION – A

Answer **ALL** questions **20 x 1 = 20M**

Q. No.	UNIT	Marks Weightage	RBT LEVEL
1	I	1	**No. of questions to be set** RBT1 – 8 RBT2 – 8 RBT3 – 2 RBT4 – 2
2	I	1	
3	II	1	
4	II	1	
5	III	1	
6	III	1	
7	IV	1	
8	IV	1	
9	V	1	
10	V	1	
11	I	1	
12	I	1	
13	II	1	
14	II	1	
15	III	1	
16	III	1	
17	IV	1	
18	IV	1	
19	V	1	
20	V	1	

SECTION – B

Answer any **FOUR** questions **4 x 8 = 32M**

Q. No.	UNIT	Marks Weightage	RBT LEVEL
21	I	8	**No. of questions to be set** RBT1 – 2 RBT2 – 2 RBT3 – 1 RBT4 – 1
22	II	8	
23	III	8	
24	IV	8	
25	V	8	
26	I / II / III / IV / V	8	

SECTION – C

Answer any **FOUR** questions **4 x 12 = 48M**

Q. No.	UNIT	Marks Weightage	RBT LEVEL
27	I	12	**No. of questions to be set** RBT1 – 2 RBT2 – 2 RBT3 – 1 RBT4 – 1
28	II	12	
29	III	12	
30	IV	12	
31	V	12	
32	I / II / III / IV / V	12	

MARIS STELLA COLLEGE (AUTONOMOUS), VIJAYAWADA-8
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Model Question Paper

Subject: Computer Science **Semester: IV**
Course Title: Operating Systems **Course Code: 20CSCCOS43**
Time: 3 Hrs. **Max. Marks: 100**

SECTION – A

Answer **ALL** questions **20 x 1 = 20 M**

1. The first line in any shell script begins with a _____
   A. &
   B. !
   C. $
   D. #
2. Which of the following is not an operating system?
   A. Windows
   B. Linux
   C. Oracle
   D. DOS
3. Choose the command which can display a calendar.
   A. cal
   B. calen
   C. find cal
   D. calender
4. What acts an interface between user and computer hardware?
   A. Motherboard
   B. Operating System
   C. C.CPU
   D. processor
5. Logical address also called as
   A. A.memory address
   B. virtual address
   C. physical address
   D. main memory address
6. _____ can be defined as the listing of the related files on the Disk
   A. folder
   B. directory
   C. address
   D. location
7. Choose the command which can display only your information.
   A. Who

B.who am i

C.i am whom

D.whomish

8. Which one of the following is not a valid state of a thread?

A. running

B. parsing

C. ready

D. blocked

9. Which queue maintains all the processes in the system

A. ready queue

B. I/O queue

C. waiting queue

D. job queue

10. Semaphore is an _____ variable.

A. float

B. memory

C. integer

D. numeric

11. FCFS stands for _____
12. In the vi editor(~) this symbol is called as_____
13. MMU stands for _____
14. Threads are also called as _____.
15. An improved version of 'vi' editor is called _____.
16. PCB Stands for _____
17. Vi always starts in _____ mode.
18. _____ command searches a file or files for lines that have a certain Pattern.
19. An operating system is a _____.
20. API stands for _____

SECTION – B

Answer any **FOUR** questions **4 x 8 = 32 M**

21. What is an operating system? List out the types of operating system
22. What is process scheduling? Explain about FCFS algorithm.
23. What is process synchronization and explain different states of process with a neat sketch.
24. Explain about different file operations in OS.
25. What is shell script? Write a shell script to display the multiplication table any number.
26. Explain about loops in shell script?

SECTION – C

Answer any **FOUR** questions **4 x 12 = 48 M**

27. Discuss about history and evolution of OS? And explain the functions of OS.
28. Define system call & system program and explain about different modes of OS with a neat sketch.
29. Explain the concept of deadlock in operating system.
30. Explain about different file allocation methods in operating system.
31. Illustrate different modes of operations in vi editor and Write a shell script to find the factorial of a given number.
32. What is a directory? Explain about OS directory structure.