PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY KANURU, VIJAYAWADA

Department of Computer Science and Engineering

II B.Tech – II Semester

**23CS3401** Operating Systems **(PVP23)**

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| **CO** | **Statement** | **Skill** | **Blooms** | **Units** |
| CO1 | Understand the structure and functionalities of operating systems | L2 | Understand | 1,2,3,4,5 |
| CO2 | Apply different algorithms of CPU scheduling, Page replacement and disk scheduling. | L3 | Apply,  Individual and Team Work | 2,4 |
| CO3 | Apply various concepts to solve problems related to process synchronization and deadlocks. | L3 | Apply,  Individual and Team Work | 3 |
| CO4 | Analyse and interpret the functionalities of operating system. | L4 | Analyze,  Communication Skills | 2,3,4,5 |

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| **Data Structures** | | |
| **Unit No.** |  | **Mapped CO** |
| I | **Operating Systems Overview:** Introduction, Operating system functions, Operating systems operations, Computing environments, Free and Open-Source Operating Systems  **System Structures:** Operating System Services, User and Operating-System Interface, system calls, Types of System Calls, system programs, Operating system Design and Implementation. | **CO1** |
| II | **Processes**: Process Concept, Process scheduling, Operations on processes, Inter-process communication.  **Threads and Concurrency**: Multithreading models, Thread libraries, Threading issues.  **CPU Scheduling:** Basic concepts, Scheduling criteria, Scheduling algorithms, Multiple processor scheduling. | **CO1,CO2,CO3,CO4** |
| III | **Synchronization Tools**: The Critical Section Problem, Peterson’s Solution, Mutex Locks, Semaphores, Monitors, Classic problems of Synchronization.  **Deadlocks:** system Model, Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from Deadlock. | **CO1,CO3,CO4** |
| IV | **Memory-Management Strategies:** Introduction, Contiguous memory allocation, Paging, Structure of the Page Table, Swapping.  **Virtual Memory Management**: Introduction, Demand paging, Copy-on-write, Page replacement, Allocation of frames, Thrashing  Storage Management: Overview of Mass Storage Structure, HDD Scheduling. | **CO1,CO2,**  **CO4** |
| V | **File System:** File System Interface: File concept, Access methods, Directory Structure; File system Implementation: File-system structure, File-system Operations, Directory implementation, Allocation method, Free space management; File-System Internals: File-System Mounting, Partitions and Mounting, File Sharing.  **Protection:** Goals of protection, Principles of protection, Protection Rings, Domain of protection, Access matrix. | **CO1,CO2,CO4** |

**CO-PO Mapping**

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| **Contribution of Course Outcomes towards achievement of Program Outcomes** | | | | | | | | | | | | | | |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
| **CO1** | **√** |  |  |  |  |  |  |  |  |  |  |  | **√** |  |
| **CO2** |  | **√** |  |  |  |  |  |  | **√** |  |  |  | **√** |  |
| **CO3** |  | **√** |  |  |  |  |  |  | **√** |  |  |  | **√** |  |
| **CO4** |  | **√** |  |  |  |  |  |  |  | **√** |  |  | **√** |  |
|  | **√** | **√** |  |  |  |  |  |  | **√** | **√** |  |  | **√** |  |

**Strength of Correlation**

Distribution of marks weightage to PO’s through CO’s.

* The strength of correlation levels is based on percentage of marks distribution towards PO.

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| --- | --- | --- | --- |
| CIE | **Test** | **Test Number** | **Marks** |
| Objective Exam (10) | Objective Exam -1 | 10 |
| Objective Exam -2 | 10 |
| Assignment (5) | Assignment -1 | 5 |
| Assignment – 2 | 5 |
| Descriptive Exam (15) | Descriptive Exam – 1 | 15 |
| Descriptive Exam - 2 | 15 |

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| **CO** | **Skill** | **Blooms** | **Units** | **Assessing Tools can be used to measure CO (CIE)**  **Marks** | **Assessing Tools can be used to measure CO (SEE)**  **Marks** |
| CO1 | Understand | L2 | 1,2,3,4,5 | Objective Exam – 20  Descriptive Exam – 10 | 30 |
| CO2 | Apply,  Individual and Team Work | L3 | 2,4 | Descriptive Exam – 10 | 10 |
| CO3 | Apply,  Individual and Team Work | L3 | 3 | Descriptive Exam – 10 | 10 |
| CO4 | Analyze,  Communication Skills | L4 | 2,3,4,5 | Descriptive Exam – 20 | 20 |

**Strength of Correlation**

|  |  |
| --- | --- |
| **% of questions towards PO** | **Level (Weight)** |
| >=20% of total marks | 3 |
| >=10% and <20% of total marks | 2 |
| <10% of total marks | 1 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO** | **Skill** | **Bloom's** | **Units** | **Assessing tools can be used to measure CO (CIE) Marks** | **CIE (Total)** | **Assessing tools can be used to measure CO (SEE) Marks** | **Total (CIE+SEE)** | **Percentage (%)** | **Strength of Correlation** | **PO** |
| **CO1** | Understand | L2 | 1,2,3,4,5 | Objective Exam(10)  Descriptive(2.5) | 10  2.5 | 30 | 30  12.5 | 30%  12.5% | 3  2 | PO1, PSO1 |
| **CO2** | Apply,  Individual and Team Work | L3 | 2,4 | Descriptive(5)  Assignment(1) | 5  1 | 10 | 5  1  10 | 5%  1%  10% | 1  1  2 | PO2  PO9  PSO1 |
| **CO3** | Apply,  Individual and Team Work | L3 | 3 | Descriptive(5)  Assignment(1) | 5  1 | 10 | 5  1  10 | 5%  1%  10% | 1  1  2 | PO2  PO9 PSO1 |
| **CO4** | Analyze,  Communication Skills | L4 | 2,3,  4,5 | Descriptive(2.5)  Assignment(3) | 2.5  3 | 20 | 11.5  2  12 | 11.5%  2%  12% | 2  1  2 | PO2,  PO10  PSO1 |

**Course Articulation Matrix:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of Correlations (3:Substantial, 2: Moderate, 1:Slight)** | | | | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| **CO1** | 3 |  |  |  |  |  |  |  |  |  |  |  | 2 |  |
| **CO2** |  | 1 |  |  |  |  |  |  | 1 |  |  |  | 2 |  |
| **CO3** |  | 1 |  |  |  |  |  |  | 1 |  |  |  | 2 |  |
| **CO4** |  | 2 |  |  |  |  |  |  |  | 1 |  |  | 2 |  |
| **Average** | 3 | 1.33 |  |  |  |  |  |  | 1 | 1 |  |  | 2 |  |

Course Coordinators:

1. Dr.P.Sai Kiran
2. Dr.S.Madhavi
3. D.Lokesh Sai Kumar

Module Coordinator:

Program Coordinator:

Dr. P Sai Kiran