



**Ganpat University**

॥ विद्यया समाजोत्कर्षः ॥

Faculty of  
**Computer Applications**



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| Programme                                                                                                                                                                                                    | BCA Honours (Cyber Security) |                                                                                        |                  |           |       | Branch                              | Computer Applications |           |       |
| Semester                                                                                                                                                                                                     | I                            |                                                                                        |                  |           |       | Version                             | 1.0.0.0               |           |       |
| Effective from Academic Year                                                                                                                                                                                 |                              |                                                                                        |                  | 2026-2027 |       | Effective for the batch Admitted in |                       | June 2026 |       |
| Subject Code                                                                                                                                                                                                 | U101E60S                     |                                                                                        | Subject Name     |           |       | OPERATING SYSTEM                    |                       |           |       |
| Teaching scheme                                                                                                                                                                                              |                              |                                                                                        |                  |           |       | Examination scheme (Marks)          |                       |           |       |
| (Per week)                                                                                                                                                                                                   | Lecture (DT)                 |                                                                                        | Practical (Lab.) |           | Total |                                     | CE                    | SEE       | Total |
|                                                                                                                                                                                                              | L                            | TU                                                                                     | P                | TW        |       |                                     |                       |           |       |
| Credit                                                                                                                                                                                                       | 2                            |                                                                                        | -                | -         | 2     | Theory                              | 25                    | 25        | 50    |
| Hours                                                                                                                                                                                                        | 2                            |                                                                                        | -                | -         | 2     | Practical                           | -                     | -         | -     |
| Objective:                                                                                                                                                                                                   |                              |                                                                                        |                  |           |       |                                     |                       |           |       |
| The course is designed to provide basic knowledge of computer operating system application and functioning. Compare several different approaches to memory management, process management and virtual memory |                              |                                                                                        |                  |           |       |                                     |                       |           |       |
| Pre-requisites:                                                                                                                                                                                              |                              |                                                                                        |                  |           |       |                                     |                       |           |       |
| Understanding operating system fundamentals                                                                                                                                                                  |                              |                                                                                        |                  |           |       |                                     |                       |           |       |
| Course Outcomes :                                                                                                                                                                                            |                              |                                                                                        |                  |           |       |                                     |                       |           |       |
| Name of CO                                                                                                                                                                                                   |                              | Description                                                                            |                  |           |       |                                     |                       |           |       |
| CO1                                                                                                                                                                                                          |                              | To make aware of application, characteristics and functionalities of operating systems |                  |           |       |                                     |                       |           |       |
| CO2                                                                                                                                                                                                          |                              | Identify process management concepts                                                   |                  |           |       |                                     |                       |           |       |
| CO3                                                                                                                                                                                                          |                              | To Know about scheduling algorithms and Deadlock concepts                              |                  |           |       |                                     |                       |           |       |
| CO4                                                                                                                                                                                                          |                              | Learn the concepts of memory management                                                |                  |           |       |                                     |                       |           |       |
| CO5                                                                                                                                                                                                          |                              | To know virtual memory management concepts with page replacement algorithms            |                  |           |       |                                     |                       |           |       |
| Mapping of CO and PO                                                                                                                                                                                         |                              |                                                                                        |                  |           |       |                                     |                       |           |       |
| Cos                                                                                                                                                                                                          | PO1                          | PO2                                                                                    | PO3              | PO4       | PO5   | PO6                                 | PO7                   | PO8       |       |
| CO1                                                                                                                                                                                                          | 3                            | 1                                                                                      | 1                | 1         | 1     | 1                                   | 1                     | 1         |       |
| CO2                                                                                                                                                                                                          | 3                            | 3                                                                                      | 2                | 1         | 1     | 1                                   | 1                     | 1         |       |
| CO3                                                                                                                                                                                                          | 3                            | 3                                                                                      | 2                | 1         | 1     | 1                                   | 1                     | 1         |       |
| CO4                                                                                                                                                                                                          | 3                            | 3                                                                                      | 2                | 1         | 1     | 1                                   | 1                     | 1         |       |
| CO5                                                                                                                                                                                                          | 3                            | 3                                                                                      | 3                | 2         | 1     | 1                                   | 1                     | 1         |       |
| Content:                                                                                                                                                                                                     |                              |                                                                                        |                  |           |       |                                     |                       |           |       |
| Unit                                                                                                                                                                                                         |                              |                                                                                        |                  |           |       |                                     |                       |           | Hrs   |

|                           |                                                                                                                                                                                                           |    |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 1                         | <b>Introduction</b><br>Overview of operating systems, functionality and characteristics of OS, Types of Operating Systems, buffering and spooling                                                         | 06 |
| 2                         | <b>Process Management</b><br>The concept of a process, operations on processes, process states, concurrent processes, process control block & process context                                             | 06 |
| 3                         | <b>Process Scheduling and Deadlock</b><br>Process scheduling algorithms: FCFS, SJF, Round Robin, Deadlock: Concept, Deadlock detection, prevention                                                        | 06 |
| 4                         | <b>Memory Management</b><br>Introduction, Logical versus Physical Address space, Partitioning, Fixed and Variable size partitioning, Swapping, Contiguous Allocation, Paging, Fragmentation, Segmentation | 06 |
| 5                         | <b>Virtual Memory</b><br>Introduction, Demand Paging, Page Replacement, Page Replacement Algorithms: FIFO, LRU, OPTIMAL.                                                                                  | 06 |
| <b>Practical Content:</b> |                                                                                                                                                                                                           |    |
| Not Applicable            |                                                                                                                                                                                                           |    |
| <b>Text Books:</b>        |                                                                                                                                                                                                           |    |
| 1                         | Operating System Concepts by Silberchatz, Abraham, Galvin, Peter Baer, Wiley Publication                                                                                                                  |    |
| <b>Reference Books:</b>   |                                                                                                                                                                                                           |    |

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| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Operating System by William Stallings, PHI Publication                                                                                        |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Modern Operating Systems, Tanenbaum, Fourth Edition. Pearson Publication                                                                      |
| <b>Web References / MOOC / Certification Course</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                               |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <a href="https://archive.nptel.ac.in/courses/106/105/106105214/">https://archive.nptel.ac.in/courses/106/105/106105214/.</a>                  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <a href="https://nptel.ac.in/courses/106108101">https://nptel.ac.in/courses/106108101.</a>                                                    |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <a href="https://www.scaler.com">https://www.scaler.com</a>                                                                                   |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <a href="https://www.geeksforgeeks.org/what-is-an-operating-system/">https://www.geeksforgeeks.org/what-is-an-operating-system/</a>           |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <a href="https://www.javatpoint.com/operating-system">https://www.javatpoint.com/operating-system</a>                                         |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <a href="https://www.tutorialspoint.com/operating_system/os_overview.htm">https://www.tutorialspoint.com/operating_system/os_overview.htm</a> |
| <b>Question Paper Scheme:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                               |
| <b>End Semester Examination Duration:</b> (1 Hour Theory Examination)<br><b>Note for Examiner: -</b><br>Q-1 Answer the following (Any One) (05 Marks)<br>Q-2 Answer the following (Any One) (05 Marks)<br>Q-3 Answer the following (Any One) (05 Marks)<br>Q-4 Answer the following (Any One) (05 Marks)<br>Q-5 Answer the following (Any One) (05 Marks)<br><br><i>The question paper must comprehensively address all Course Outcomes (COs), align Taxonomy levels, and ensure complete syllabus coverage.</i> |                                                                                                                                               |