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| **Learning Outcomes** | The students at the end of the paper, will have some knowledge of designing a point to point optical link for a given situation. They will also be able to choose the right type of components if an assignment of optical network design is given. The course is also useful for students who would like to join telecom industries, as many aspects of practical situation are discussed during course of study. They are also taught to monitor signal losses during course of signal transmission. The student from this course will be confident | |

**Course Code:** ELD 202 **Title of the Course:** OPERATING SYSTEM AND RTOS
**Number of Credits:** 4

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| **Prerequisites for the course:** | Should have studied digital electronics at graduate level | |
| **Objective:** | This course develops to focus on concept of highlighting the various methods of improvising speed of computing machine through the operating system organization and various entity managements. Further the subject is developed to analyse the small embedded system developments through the Real Time Operating Systems for task management efficiency. | |
| **Content:** | Introduction to Computer Organization and Architecture : hardware vs. software -the virtual machine concept, concept of von Neumann architecture, hardware components and functions, trends in hardware development, system configurations and classifications.<br><br>Process Description and Control: Processes, process states, processor modes, context switching,<br>CPU scheduling algorithms, threads.<br><br>Concurrency Control: Concurrent processes, critical section problem and solutions, mutual exclusion solution requirements, semaphores and monitors.<br><br>Deadlocks: Characterization, detection and recovery, avoidance, prevention.<br><br>Inter Process Communication: classical IPC problems and solutions, IPC techniques.<br><br>The Input/Output and File Subsystem: I/O devices, controllers and channels, bus structures, 1/0 techniques (programmed, interrupt driven and DMA), I/O subsystem layers. Concepts of files and directories, issues and techniques for efficient storage and access of data. I/O and file system support for graphics, multimedia, databases, transaction | 6 hours<br><br>5 hours<br><br>5 hours<br><br>5 hours<br><br>3 hours<br><br>6 hours |

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| | processing and networking.<br><br>The Memory Subsystem: Memory types and hierarchy, module level Organization, cache memory. Memory partitioning, swapping, paging, segmentation, virtual memory.<br><br>The Central Processing Unit: CPU components, register sets, instruction cycles, addressing modes, instruction sets, concept of micro-programming ,Basics of RISC approach, pipelined and super-scalar approaches, vector processors and parallel processors, hardware support for the OS.<br><br>µCOS case study<br><br>Tutorial<br>1. Implementing Lower Level Shell<br>2. Implementing Signal in Unix<br>3. Hard disk partitioning in Linux | 8 hours<br><br>6 hours<br><br>4 hours |
| | Total | 48 |
| **Pedagogy:** | Lectures/ tutorials/assignments/self-study | |
| **References/Readings** | 1.Operating system principles, 3rd Edition,by Willian Stallings –PHI(1998)<br>2. Operating system concepts by Silberchatz and Galvin - Addision wesley<br>3. Operating system by Tanaumbuam, PHI New Delhi | |
| **Learning Outcomes** | Will able to generalize the understanding of the computing machine and various entities associated with the enhancement of the efficiency. Will able to handle the operating system management process, memory, I/O, Secondary Disk and organizations of various. Students will able to handle any operating system for process and task managements if follows the documentations of the same. | |

**Course Code:** ELC 202 **Title of the Course:** ELECTRONICS PRACTICALS-II

**Number of Credits:** 4

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| **Prerequisites for the course:** | Should have studied microcontrollers and embedded system. | |
| **Objective:** | The students will handle experiments on processor and | |