# **Basic Information**

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| **Semester** | **:** | Fall 2025 |
| **Course Code** | **:** | CSE 362 |
| **Course Title** | **:** | Operating Systems Lab |
| **Credit** | **:** | 1.0 |
| **Pre-requisite Courses** | **:** | |  |  | | --- | --- | | **Course Code** | **Course Title** | |  |  | |  |  | |
| **Course Offering Department** | **:** | Department of Computer Science and Engineering |
| **Faculty** | **:** | APA |
| **Class Schedule** | **:** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Course Code** | **Section** | **Room Number** | **Day** | **Start Time** | **End Time** | | CSE 362 | 1, 2, 3 | SEU613 | Sunday, Wednesday | 8:00  11:30 | 10:00  13:30 | |
| **Consultation Schedule** | **:** | |  |  |  |  | | --- | --- | --- | --- | | **Day** | **Start Time** | **End Time** | **Duration** | | Thursday | 10.00 | 16:00 | 6 hours | |
| **Contact Number** | **:** | +8801521561806 |
| **Email Address** | **:** | ashraful.islamparan@seu.edu.bd |

# **Routine of Faculty**

# **Course Details**

## **Importance of the Course**

The “Operating Systems Lab” course provides an in-depth examination of the essential tools and principles required to develop modern operating systems, with a strong focus on UNIX-like environments such as GNU/Linux. The course is divided into two main parts: the first part emphasizes mastery of the GNU/Linux command-line interface, enabling students to efficiently navigate and administer systems. The second part concentrates on the GNU/Linux application programming interface (API), through which students complete practical exercises to understand process and thread creation, along with mechanisms for managing them. Via hands-on projects, learners develop skills in cooperative resource allocation among processes, process scheduling, concurrency control, memory management, and file input/output structures. More advanced concepts, such as synchronization primitives, mutual exclusion, deadlock prevention, and starvation avoidance are also covered, preparing students with a solid foundation in operating system principles for careers in software engineering, system administration, and related fields.

## **Objectives**

The primary purpose of this course is to provide students with a practical introduction to command-based operations in UNIX-like operating systems. Its key objectives include enabling learners to effectively utilize the UNIX command line for navigating and exploring open-source software within the GNU/Linux environment; developing foundational skills in shell scripting while addressing process and thread management in contemporary operating systems, including the implementation of concurrency control mechanisms, such as mutual exclusion, synchronization, deadlock prevention, and avoidance of starvation, through semaphores via the GNU/Linux POSIX API; and applying algorithmic concepts through programming in shell scripting.

## **Course Outcomes (COs)**

At the end of the course, the students will be able to:

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| --- | --- | --- | --- | --- |
| **COs** | **Description** | **POs** | **Teaching-Learning Strategy** | **Assessment Strategy** |
| **CO1** | **Interpret** the GNU/Linux GUI and command line interface. | PO5 | Lectures, Active discussion,  Solving logical problems. | **Formative**:  - Essay Questions  - Quiz  - Viva voce  **Summative**:  - Final Examination |
| **CO2** | **Demonstrate** the file Handling in GNU/Linux, Programming with Shell Scripting. | PO3 | Lectures, Practice problems | **Formative**:  - Essay Questions  - Quiz  - Viva voce  **Summative**:  - Final Examination |
| **CO3** | **Implement** technical aspects of modern operating systems. | PO3 | Lectures, Practice problems | **Formative**:  - Essay Questions  - Quiz  - Viva voce  **Summative**:  - Final Examination |
| **CO4** | **Write** an effective report on the technical solutions of modern operating systems.. | PO10 | Lectures, Practice problems | **Formative**:  - Essay Questions  - Quiz  - Viva voce  **Summative**:  - Final Examination |

## **Course Outcomes (COs) and Program Outcomes (POs) Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO** | **PO** | | | | | | | | | | | | |
| **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** |  |  |  |  | ✔ |  |  |  |  |  |  |  |
| **CO2** |  |  | ✔ |  |  |  |  |  |  |  |  |  |
| **CO3** |  |  | ✔ |  |  |  |  |  |  |  |  |  |
| **CO4** |  |  |  |  |  |  |  |  |  | ✔ |  |  |

## **Tentative Lecture Plan**

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| --- | --- | --- | --- | --- |
| **Sl no.** | **Lecture No.** | **Contents** | **Learning Outcome** | **Learning Resources** |
| 1 | Lecture 1 | Introduction to the course, Installation process, and project structure | Introduction to the course and course outline. Discussion on OBE of Operating System & System Program Lab & Introduction to Linux Operating system | Course Outline &  Class Lecture |
| 2 | Lecture 2 | Introduction to WSL | Installation: Linux Installation using Virtual Machine Platform | Class Lecture |
| 3 | Lecture 3 | Windows Vs Linux | Windows Vs Linux: Type of files, directories, users | Class Lecture |
| 4 | Lecture 4 | Commands Terminal V/s GUI | Commands Terminal V/s GUI  File Commands (ls, cd, pwd, mkdir, cp, mv, rm, rmdir, cat, more, less, touch, head, tail, ls) | Class Lecture |
| 5 | Lecture 5 | File Permissions | File Permissions (chmod), File Redirection (>, >>), vi Editor, nano editor and their functionalities | Class Lecture |
| 6 | Lecture 6 | Searching and System Information | Searching (grep, locate, find)  System Information (date, cal, w, whoami, finger, uname, cat /proc/cpuinfo) | Class Lecture |
| 7 | Lecture  7 | Unix Administration | Unix Administration (Creating a User, Deleting, disabling account, Adding users to the user groups, Finger, Linux/Unix User Management Commands | Class Lecture |
| 8 | Lecture  8 | Basic of Shell Scripting | Introduction, a brief understanding of Basic of Shell Scripting | Class Lecture |
| 9 | Lecture  9 | Conditional statement | Implement Conditional statement in shell scripting. | Class Lecture |
| 10 | Lecture  10 | Loop in shell scripting | Implement Loop in shell scripting and Implementation of the scheduling algorithm. | Class Lecture |
| 11 | Lecture  11 | File Handling | File Handling in GNU/Linux, Programming with Pipes, Sockets Programming. | Class Lecture |
| 12 | Lecture  12 | Review Class | | Class Lecture |
| **Final Exam Week** | | | | |

## **Teaching and Learning Methods**

* Online Learning Management System (Google Classroom)
* Lecture delivery in Physical Class
* Lecture materials in Google Classroom
* Discussion during class and counseling hours
* Sample codes provided during physical class and via Google Classroom

## **Assessment**

### **Tentative Assessment Schedule**

| **Serial** | **Assessment Type** | **Schedule** | **Comments** |
| --- | --- | --- | --- |
| 1. | Lab Performance Test | Week 6 | Announcements will be given ahead of time. |
| 2. | Lab Report | Week 11 | Announcements will be given ahead of time. |
| 3. | Final Exam | Week 12 | Announcements will be given ahead of time. |

### **Tentative Weight Assessment**

| **Assessment Tools** | **Percentage** |
| --- | --- |
| Attendance | 010% |
| Lab Performance | 010% |
| Lab Report | 020% |
| Viva | 020% |
| Final Examination | 040% |
| **Total** | **100%** |

### **Grading Policy**

| **Obtained Marks** | | **Letter Grade** | **Grade Point** | **Assessments** |
| --- | --- | --- | --- | --- |
| **Minimum** | **Maximum** |
| 080% | 100% | 4.00 | A+ | Outstanding |
| 075% | 079% | 3.75 | A/ | Excellent |
| 070% | 074% | 3.50 | A- | Very Good |
| 065% | 069% | 3.25 | B+ | Good |
| 060% | 064% | 3.00 | B/ | Average |
| 055% | 059% | 2.75 | B- | Below Average |
| 050% | 054% | 2.50 | C+ | Poor |
| 045% | 049% | 2.25 | C/ | Very Poor |
| 040% | 044% | 2.00 | D/ | Passing |
| 000% | 039% | 0.00 | F/ | Fail |

## **Lecture Materials**

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| --- | --- |
| Lecture Notes | As provided during class |
| Text Book(s) | 1. Richard Blum, Christine Bresnahan, Linux Command Line and Shell Scripting Bible, 4th Edition, Wiley, 2021, ISBN: 978-1118983843. |
| Reference Book(s) | 1. William Stallings, Operating Systems: Internals and Design Principles, 9th Edition, Pearson, 2015, ISBN: 978-0134670959. 2. Lab Manual |
| Online Resources | Resources as provided during class time |

## **Aiding Materials for Learning**

* + 1. Internet Connectivity
    2. SEU official email ID.
    3. Should know how to use “Google Meet” and “Google Classroom.”

## **Faculty Suggestions**

* The dates and syllabus of the lectures, class tests, midterm, and final exams are already given here; however, announcements will be made ahead of time. There is **NO** provision for make-up class tests.
* The reading materials for each class may be given before that class so that students can have a cursory look at the materials. All materials (lecture notes, supporting reading materials, etc) will be made available through Google Classroom (classroom.google.com).
* Class participation is vital for a better understanding of the subject matter. The class will be conducted in an interactive environment where the teacher and the students must pose questions and discuss solutions for better understanding.
* Mobile phones or other devices **MUST** stay silent during class and exam periods.
* A student who cheats, plagiarizes, or furnishes false, misleading information in the course is subject to disciplinary action up to and including an F grade in the course and/or suspension/expulsion from the University.
* Students must maintain the code of conduct specified by SEU.
* The goal of any assignment is to give you practice in mastering the course material. Consequently, you are encouraged to collaborate on problem sets. In fact, students who form study groups generally do better on exams than do students who work alone.
* You must write up each problem solution by yourself without assistance. It is a violation of this policy to submit a problem solution that you cannot explain verbally to the course teacher.
* No collaboration whatsoever is permitted during the examination.