**OPERATING SYSTEM**

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**Software Engineering**

**Ms. Kausar Nasreen Khattak**

**Email: kausar.nasreen@riphah.edu.pk**

**Faculty of Computing**

**Riphah International University Islamabad Gulberg Green Campus**

**SEMESTER PROJECT**

**Introduction**

The Linux Operating System (OS) Project is designed to provide students with a comprehensive understanding and practical experience in working with Linux-based systems. The project aims to foster creativity, critical thinking, and practical skills in utilizing Linux OS for various purposes. Students will have the freedom to choose their project topics within the scope of Linux OS, allowing them to explore areas of personal interest while mastering essential concepts and techniques.

**Project Objectives**

* To familiarize students with basic Linux commands and operations.
* To explore advanced topics such as system calls, shell scripting, signal handling, and threading in Linux.
* To encourage students to apply theoretical knowledge to practical scenarios through hands-on projects.
* To enhance problem-solving skills and proficiency in Linux-based environments.

**Project Guidelines**

Students are encouraged to select a project topic based on their interests and preferences within the Linux OS domain. While the projects should demonstrate proficiency in Linux, they can vary in scope and complexity. Projects may involve the development of scripts, applications, or system-level implementations that utilize Linux functionalities**.**

**Topics Covered in Lab Sessions**

1. Basic Commands: Introduction to essential Linux commands for file, directory etc.
2. Streams, Redirection, and Pipes: Understanding input/output streams, redirection techniques, and inter-process communication using pipes.
3. System Calls: Exploring system calls such as fork(), exec(), wait(), and exit() for process management and control.
4. Basic Shell Scripting: Writing simple shell scripts to automate tasks and execute commands.
5. Shell Scripting - Selection Construct: Implementing conditional statements and branching in shell scripts.
6. Shell Scripting - Iterative Construct: Utilizing loops for repetitive tasks and automation in shell scripts.
7. Signal Handling: Handling signals and responding to asynchronous events in Linux applications.
8. Threads and Threads Programming: Introduction to threading concepts in Linux environments.
9. Pointers and Arrays: Understanding the basics of pointers and arrays in C programming language, with applications in Linux development

**Project Submission Requirements**

* Projects must be implemented using Linux OS.
* Each project should demonstrate understanding and application of at least one of the topics covered in the lab sessions.
* Documentation outlining project objectives, methodology, implementation details, and results should be submitted along with the project code.
* Projects will be evaluated based on creativity, technical proficiency, adherence to project guidelines, and demonstration of Linux concepts.