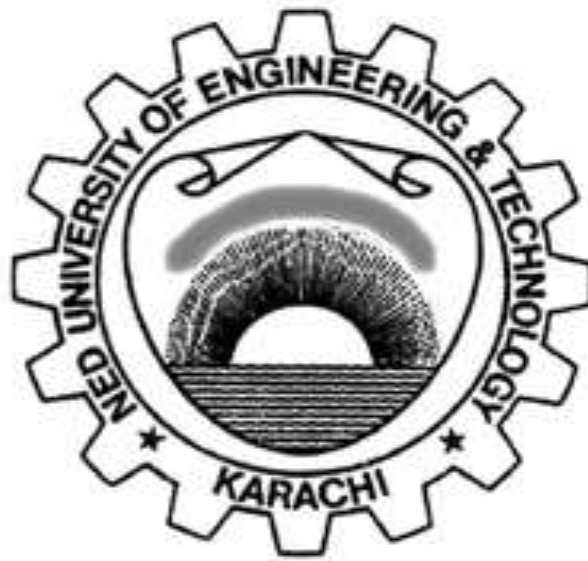


Practical Workbook  
**CS-219**  
**Computer Engineering Workshop**



Name : \_\_\_\_\_  
Year : \_\_\_\_\_  
Batch : \_\_\_\_\_  
Roll No : \_\_\_\_\_  
Department: \_\_\_\_\_

**Department of Computer & Information Systems Engineering  
NED University of Engineering & Technology**

**Practical Workbook  
CS-219  
Computer Engineering Workshop**



# INTRODUCTION

This workbook has been compiled to assist the conduct of practical classes for CS-219 Computer Engineering Workshop. Practical work relevant to this course aims to guide you through various aspects of C programming and Linux system administration. This workbook is tailored to provide hands-on experience and practical knowledge in mastering C programming fundamentals, exploring advanced topics, and delving into essential Linux system tasks.

The Course Profile of CS-219 Computer Engineering Workshop lays down the following Course Learning Outcome:

**Attain** hands-on experience with contemporary technologies of Computer Engineering (C3, PLO-5). All lab sessions of this workbook have been designed to assist the achievement of the above CLO. A rubric to evaluate student performance has been provided at the end of the workbook.

These labs cover a comprehensive range of topics in C programming and Linux system administration. Students will begin with the fundamentals of C, including syntax and data structures, progressing to advanced concepts like pointers, dynamic memory allocation, and file handling. The Linux-focused labs teach essential commands, file and directory management, and shell scripting. Additionally, participants will explore debugging tools, automation with Makefiles, and interactions with the Linux file system. The final labs concentrate on managing Linux users and groups, emphasizing security and access control. Overall, these hands-on exercises provide a well-rounded learning experience for both C programming and Linux system tasks.

# CONTENTS

Lab Session#	Title	Page#	Teacher's Signature	Date
1.	Exploring C Programming Fundamentals	01		
2.	Exploring Loop, Arrays, and Structures in C Programming	08		
3.	Exploring Pointers in C	16		
4.	Exploring Dynamic Memory Allocation and Linked list in C	23		
5.	Exploring File Handling in C	31		
6.	Exploring Header Files in C	39		
7.	Use some of the most frequently executed Linux operating system commands	46		
8.	Handle files & directories in Linux Operating System	50		
9.	Practice Shell Scripting	63		
10.	Use conditional statements, iteration statements and functions in Shell Scripting	69		
11.	Using gcc and gdb in Linux Operating System	78		
12.	Automating build processes with Makefiles in C	83		
13.	Interacting with the FileSystem using Linux System calls	89		
14.	Managing Linux users and groups	96		
	Grading Rubric Sheets	100		