Date	Lecture	Topic
Monday, January 13	Lecture 1 - Welcome to CSC362	About this Course Course Stucture How to Succeed Mark Allocation Setting Up Programming Environment - VSCode, Compilers, GitHub
Wednesday, January 15	Lecture 2 - Introduction in C	Compiled vs Interpreted Language Crash course Introduction in C preprocessor directives void - no arguments compiler - GCC and Clang Control Structures - for, while, do-while, switch case Language Facilities - continue, extern, sizeof, struct, typedef
Friday, January 17	Lecture 3 - Terminal Commands	Terminal Commands - Basic Navigation Commands - File Manipulation Commands - Environment Variables
Monday, January 20	Dr. Martin Luther King Jr. holiday. Classes dismissed.	
Wednesday, January 22	Lecture 4 - Git Workflow & Commands	Git Workflow & Commands - Authentication using SSH - Working Directory - Staging/Index - Local Repository - Remote Repository - Branching and Merging - Clone Existing Repo and Track Differences
Friday, January 24	Lecture 5 - Programming Beyond the Basics	Pointers in C var, &var, *pointerVar = &var Pointer Arithmetic Dynamic Memory Allocation Strings in C Common Bugs - Null Bytes
Monday, January 27	Quiz 1	
Wednesday, January 29	Lecture 6 - Dynamic Memory Allocation	Static vs Dynamic Memory Allocation malloc, calloc, realloc, free Memory Leaks Dangling Pointers Common Bugs - Double Free

Friday, January 31	Lecture 7 - Preprocessor Directives and Macro Concepts	Preprocessor directives - define - if - ifdef - ifndef - undef Macro Expansions - simple vs parameterized File Inclusion <header.h>, header.h
Monday, February 3	Lecture 8 - Compiling Multi-File Projects	Dependency Tracking Makefiles - Structure - Common Targets - Variables and Pattern Rules
Wednesday, February 5	Lecture 9 - Advanced Makefile Application	Common Variables Phony Targets Pattern Rules Automatic Variables Conditional Directives Recursive Make
Friday, February 7	Quiz 2	
Monday, February 10	Lecture 10 - Compilation Stages and Linking	Compilation Stages Preprocessing, Compiling, Assembling, Linking Static Linking vs Dynamic Linking Shared Libraries Dynamic Linking with - dlopen(), dlsym(), and dlclose() Shared Library Versioning
Wednesday, February 12	Lecture 11 - Static Libraries and Relocation Techniques	Static Library - ar rcs command, .a and .o files Creating archive (.a) files Relocation Static Relocation - nm command - diagnostics - type column Dynamic Relocation - position independent code, shraed library - display symbol table, vmmap command
Friday, February 14	Midterm Revision Class	
Monday, February 17	Midterm Examination	

Wednesday, February 19	Lecture 12 - Process	Process Control Block Parent-Child Relationship fork(), exec(), wait(), waitpid(), exit(), getpid(), getppid() zombie process - ps aux | grep Z Observe Process Behavior in Process Control Block Orphan Process
Friday, February 21	Lecture 13 - Inter Process Communication	Inter Process Communication Pipes - file descriptors, unidirectional & bidirectional communication Shared Memory - using mmap
Monday, February 24	Lecture 14 - Memory Layout in C	global, local, init, uninit, static variables Text Segment - unix permissions Data Segment, BSS - objdump, otool commands Heap Segment, Stack Segment - Growth Directions Stack Frames - Managing subroutines
Wednesday, February 26	Quiz 3	
Friday, February 28	Lecture 15 - Memory Management	Memory Fragmentation - Internal and External Fragmentation Memory Placement Strategies - First Fit, Best Fit, Worst Fit, Buddy Allocation
Monday, March 3	Lecture 16 - Advanced Strategies for Managing Memory	Strategies for Managing Fragmentation: - Memory Coalescing - Memory Compaction
Wednesday, March 5		Strategies for Managing Fragmentation: - Slab Allocation - Buddy System Allocation - Segregated Free List
Friday, March 7	Lecture 17 - Dynamic Memory Allocation Techniques and Free Block Management	Implicit Free List, Bidirectional Coalescing, Explicit Free List Splitting, False Fragmentation, Boundary Tags Free Block Insertion Policy - LIFO
Monday, March 10	Spring Break. Classes dismissed.	
Wednesday, March 12		
Friday, March 14		

Monday, March 17	Lecture 17 - Dynamic Memory Allocation Techniques and Free Block Management	Implicit Free List, Bidirectional Coalescing, Explicit Free List Splitting, False Fragmentation, Boundary Tags Free Block Insertion Policy - LIFO
Wednesday, March 19	Quiz 4	
Friday, March 21	Lecture 18 - Multi-Threaded Programs	Threads vs Processes Multi-threaded Programs in C pthread_create pthread_join pthread_exit pthread_cancel
Monday, March 24	Lecture 19 - Thread Synchronization and Concurrency Management	Race Conditions Critical Sections Atomic Operations Thread Synchronization Thread Safety and Basic Thread-Safe Programming Dekker's Algorithm, Condition Variables
Wednesday, March 26	Lecture 20 - Thread Synchronization Mechanisms	Mutex
Friday, March 28	Lecture 20 - Thread Synchronization Mechanisms	Sempahores
Monday, March 31	Lecture 21 - Deadlock Management: Prevention and Avoidance Strategies	Deadlock Prevention - 4 conditions of Deadlock Mutual Exclusion, No Preemption, Hold & Wait, Circular Dependencies
Wednesday, April 2	Lecture 21 - Deadlock Management: Prevention and Avoidance Strategies	Deadlock Avoidance - Banker's Algorithm
Friday, April 4	Lecture 21 - Deadlock Management: Prevention and Avoidance Strategies	Deadlock Detection - Resource Allocation Graphs and Wait for Graphs
Monday, April 7	Quiz 5	

Wednesday, April 9	Lecture 22 - Deadlock Detection Techniques	Deadlock Detection - Resource Allocation Graphs - Single Instance, Multiple Instance Wait-For Graphs
Friday, April 11	Lecture 22 - Deadlock Detection Techniques	
Monday, April 14	Lecture 23 - Network Fundamentals: Protocol Models, Data Encoding, and TCP Connections	OSI vs TCP/IP Model - 7 layers Synchronization Clock and Clock Rate Manchester Encoding TCP Connection - SYN, ACK packages TCP Client and Server Socket Programming
Wednesday, April 16	Lecture 23 - Network Fundamentals: Protocol Models, Data Encoding, and TCP Connections	
Friday, April 18	Spring Holiday. Classes dismissed.	
Monday, April 21	Lecture 24 - Cybersecurity Threats and Protection Mechanisms	Malware - WannaCry, Stuxnet, Zeus Denial of Service (DoS) Attacks Man-in-the Middle (MitM) Attacks SQL Injection, Phishing Authentication vs Authorization Encryption, Hashing Algorithms
Wednesday, April 23	Lecture 24 - Cybersecurity Threats and Protection Mechanisms	SSL/TLS Security Protocols SSH (Secure Shell) Firewalls - Access Control List Packet-Filtering Firewalls - Stateless vs Stateful IPtables Virtual Private Networks (VPNs)
Friday, April 25	Lecture 25 - Virtualization and Containers	A guide to Docker - Essential Docker commands Setting up virtual containers in VSCode, Docker Desktop, and remote container based development environments
Monday, April 28	Lecture 25 - Virtualization and Containers	
Wednesday, April 30	Final Exam Revision Class	
Friday, May 2	Final Examination	