

| Modules With Details | #Days |
|--|------------|
| 1. Advanced C | 25 |
| 1.1 Development tools and environment | |
| Introduction | 0.6 |
| Minimal usage of VI editor | 0.6 |
| 1.2 Compilation | 2.8 |
| Compilation options | 0.5 |
| First C program | 0.3 |
| Using -o | 0.2 |
| Preprocessing | 0.1 |
| Using -E | 0.1 |
| Compiling | 0.1 |
| Using -g | 0.1 |
| Linking | 0.2 |
| Using -c | 0.2 |
| Executable file format | 0.5 |
| Using nm command | 0.5 |
| Q1. What is use of -S, -i, -D options? | |
| Q2. Demonstrate Preprocessing, Compiler and linker errors | |
| Q3. Is it possible to generate executable file from a.c and b.o? | |
| 1.3 Make file utilities Introduction | 0.5 |
| Write a simple make file. | 0.5 |
| 1.4 Creating archives Introduction | 0.6 |
| Modified archives | 0.3 |
| Adding functions to archives | 0.3 |
| 1.5 Debugging | |
| Using GDB | |
| Setting break points | |
| Analyzing the stack | |
| Analyzing the registers | |
| 1.6 Source Code Control Systems | |
| What is CVS | |
| | |

| | |
|---|------------|
| 1.7 Different storage sections | 1.5 |
| Example Program | 0.5 |
| Text | 0.2 |
| Data | 0.2 |
| BSS | 0.2 |
| Heap | 0.2 |
| Stack | 0.2 |
| 1.8 Project Environment development | 0 |
| 1.8.1 Module concept | |
| 2.8.2 Interface functions | |
| 3.8.3 Unit testing of module | |
| 4.8.4 Test Driver | |
| 4.8.5 Test Stubs | |
| 1.9 Functions | 3 |
| Function declaration, Prototype, Definition, Invocation | 0.3 |
| Function return type | 0.3 |
| Output parameters | 0.3 |
| Call by value and reference | 0.3 |
| Local variables | 0.3 |
| Static variables | 0.3 |
| Recursive functions | 0.3 |
| Re-entrant functions | 0.5 |
| Pushing and popping the variables in invocation | 0.4 |
| 1.10 Pointers | 3 |
| Pointers Vs Integers | 0.3 |
| Pointer type | 0.3 |
| Pointer de-reference | 0.3 |
| Pointers and arrays | 0.2 |
| Pointer arithmetic | 0.5 |
| Array of pointers | 0.4 |
| Pointers and Dynamic memory | 0.5 |
| Function pointers | 0.5 |
| 1.11 Arrays | 2 |
| Valid Indexes to array | 0.2 |
| Addresses of elements of array | 0.2 |
| Initialization | 0.2 |
| Using pointer as an array | 0.3 |

| | |
|---|-----------|
| 7. Embedded System Programming(RTOS VxWorks/uCOS/pSOS/ucLinux) | 15 |
| 7.1 Introduction to RTOS | |
| 7.2 Difference between GPOS Vs RTOS | |
| 7.3 Embedded programming (Using VxWorks or VxWorks like OS) | |
| 7.4 Process Management in VxWorks | |
| 7.5 IPC in VxWorks | |
| | |

| | |
|---|-------------|
| RARP | 0.5 |
| Connectionless Delivery System | 0.25 |
| Purpose Of The Internet Protocol | 0.75 |
| Routing | 4 |
| Direct and Indirect Delivery | 0.25 |
| 5.4 ICMP | 1.25 |
| Internet Control Message Protocol | 0.25 |
| Error Reporting Vs Error Correction | 0.25 |
| ICMP Message delivery | 0.25 |
| ICMP Message Format | 0.25 |
| Direct and Indirect Delivery | 0.25 |
| 5.5 User Datagram Protocol | 2 |
| Format Of UDP Messages | 1 |
| UDP pseudo-Header | 1 |
| 5.6 TCP | 6 |
| Properties Of The Reliable Delivery Service | 2 |
| Sliding Windows | 2 |
| TCP Segment Format | 2 |
| 5.7 DNS Application Layer protocol | 2 |
| 5.8 RIP | 2 |
| 5.9 SMTP | 2 |
| 5.10 HTTP | 1 |
| 6. Real Life Projects | |
| 6.1 CPU Usage and Overload Detection & Action | 5 |
| 6.2 Memory Usage and Overload Detection&Action | 5 |
| 6.3 Character Driver Implementation | 5 |
| 6.4 Pseudo Driver implementation | 5 |
| 6.5 DHCP client | 15 |
| 6.6 SMTP client | 15 |
| 6.7 DNS client (UDP) | 15 |
| 6.8 WGET client | 5 |
| 6.9 FTP client | 15 |
| 6.10 POP3 Client | 15 |
| 6.11 SNTP client | 15 |
| 6.12 TFTP client | 15 |

| | |
|---|----------|
| Strings | 0.2 |
| Passing an array to a function | 0.3 |
| Two-dimensional array initialization | 0.3 |
| Two dimensional arrays and pointers | 0.3 |
| 1.12 Structures | 2 |
| Compound type | 0.2 |
| Packing of elements within a structure | 0.2 |
| Alignment and hole in the structure | 0.3 |
| Structure pointers | 0.2 |
| Accessing elements of a structure using structure pointer | 0.2 |
| Dynamic allocation of memory for structures | 0.2 |
| Self referential structures | 0.2 |
| Passing structure parameters to functions | 0.2 |
| Returning a structure or structure pointer by a function | 0.3 |
| 1.13 Unions | 1 |
| Differences between union and structure | 0.5 |
| Uses of unions | 0.5 |
| 1.14 Bitwise operations | 4 |
| Binary, Decimal and Hex conversions | 0.5 |
| Logical versus Bit wise operations | 0.5 |
| Masking a bit | 0.5 |
| Testing a bit | 0.5 |
| Setting a bit | 0.5 |
| Testing a set of bits | 0.5 |
| Setting a set of bits | 0.5 |
| Value representation in Memory | 0.5 |
| 1.15 File manipulations | 4 |
| Reading text file | 0.5 |
| Reading binary file | 0.5 |
| Writing text file | 0.5 |
| Writing binary file | 0.5 |
| Deleting file | 0.5 |
| Searching string in a file | 1 |
| Writing copy command | 0.5 |
| | |

| | |
|----------------------------------|-------------|
| 2. Data Structures | 13 |
| 2.1 Strings | 4 |
| Parsing strings | 2 |
| Building messages | 2 |
| 2.2 Arrays | 2.7 |
| Sorting | 0.9 |
| Deleting elements | 0.9 |
| Adding elements to array | 0.9 |
| 2.3 Linked list | 4 |
| Single Linked list | 1 |
| Double linked list | 1 |
| Hashed list | 1 |
| Circular list | 1 |
| 2.4 Searching | 2.3 |
| Linear search | 0.7 |
| Binary search | 0.6 |
| Hash based search | 1 |
| 3. Unix (Linux) Internals | 15 |
| 3.1 File Management | 4.25 |
| INODE | 0.5 |
| Structure of a regular file | 0.5 |
| Directories | 0.5 |
| Path name to INODE | 0.75 |
| Super Block | 1 |
| INODE assignment to a new file | 0.5 |
| Allocation of disk blocks | 0.5 |
| 3.2 Process Management | 3 |
| Process states and Transition | 0.5 |
| Layout of a system memory | 0.5 |
| Process context | 0.5 |
| Process creation | 0.5 |
| System Boot and the INIT process | 0.5 |
| Process Scheduling | 0.5 |
| 3.3 Memory Management | 2 |
| Swapping | 0.5 |
| Demand paging | 0.5 |

| | |
|--|-------------|
| Segmentation and regions | 0.5 |
| Page out and swapping | 0.5 |
| 3.4 I/O Management | 2 |
| Driver interfaces | 0.5 |
| Disk Drivers | 0.5 |
| Terminal Drivers | 0.5 |
| Streams | 0.5 |
| 3.5 IPC | 3.75 |
| Pipes and FIFOs | 0.5 |
| Message queues | 0.5 |
| Client and Server communication Using Message queues | 0.5 |
| Synchronization | 0.5 |
| Semaphores | 0.5 |
| Binary Vs Counting Vs Mutex semaphores | 0.5 |
| Shared Memory | 0.25 |
| Signals | 0.25 |
| Interrupts | 0.25 |
| 4. Network programming | 6 |
| 4.1 Client Server programming | 3 |
| TCP client | 1 |
| UDP client | 0.5 |
| TCP server | 1 |
| UDP server | 0.5 |
| 4.2 Iterative server | 2 |
| TCP Iterative server | 1 |
| UDP Iterative server | 1 |
| 4.3 Concurrent server | 1 |
| TCP concurrent server | 1 |
| 5. Datacom (TCP/IP) | 26 |
| 5.1 Types of networks | 1 |
| 5.2 Ethernet Layer | 1 |
| 5.3 Internet Protocol | 7.75 |
| IP address classes | 0.5 |
| Network And Broadcast Address | 0.5 |
| Loopback Address | 0.5 |
| ARP | 0.5 |