

Embedded Programming – 2 Months Eligibility – B.E, B.Tech, M.E, M.Tech.

Modules:

- C Programming
- Data Structures
- C++
- Linux Commands, Shell Scripting
- Linux System programming.
- Linux Device Driver

Platform:

- Ubuntu (Linux OS, with gcc compiler).
- Lpc2129, Lpc1768, Keil Micro vision.

Project Stream:

- Embedded Project development using wired/wireless technology such as GPS, GSM, BLE, Wi-Fi and sensors.
- Application development based on Data Structure (eg: Flood fund releasing data, cyber management systems, Bank management system, contact management system).
- Concurrent server to replicate a chat application using socket programming.

Modules

Section – 1 Recordings

Programming in C & Data Structures - 12 hrs

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| Introduction to C | Data types | Operators |
| Control Flow | Modular Programming | Preprocessor |
| Storage classes | Arrays & Strings - Character Arrays | Advanced C Programming: Pointers |
| Advanced Pointers : NULL pointer, Pointer to a constant , constant pointer | Dynamic memory allocation | Recursion |
| Command line arguments | Files I/O, Block I/O | Random Access - fseek , ftell , rewind |
| Data structures Introduction | Stack and Queues | Linked list introduction |
| Types of linked list | Trees Introduction | BST and Expressions |

Linux Commands – 2 hrs

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| File & Directory Commands - ls, mkdir, cd, pwd, rm, cat | Process Related Commands - Ps, fg, bg, jobs | Text Manipulation Commands - Head, tail, cut, paste, sort, diff, comm. |
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Section – 2 Live Online Sessions

C++

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| Introduction to object oriented programming | Procedural Approach in C++ | Function Overloading & Name Mangling |
| Object oriented Approach in C++ | operator overloading | Constructors & Destructors |

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| Dynamic memory allocation techniques in C++ | Static and constants | Friend: Function and class |
| Generic programming | Inheritance and "is a " relationship | Run time polymorphism |
| Shell Scripting & Linux System Programming | | |
| Shell Scripting | Conditions: if, switch, expr, test | Loops: while, for |
| Kernel Architectures | File Management related system calls | Process Management related system calls |
| IPC's | Signals | PIPE: unnamed and named pipes |
| Message Queue | Shared Memory | Semaphore Arrays |
| Introduction to Computer Networks | Categories of Networks | OSI Reference Model |
| Transmission Media | IPV4 Internet Addressing | Client - Server Paradigm |
| Network Application Software | Network Topologies : Bus, Ring, Star, Mesh | Network Layer, Transport Layer |
| Multithreading using Posix Threads | MUTEX | |
| Socket Programming | TCP/IP Protocol | UDP/IP Protocol |
| Linux Device Drivers | | |
| Introduction to Device Drivers | CHAR Drivers | Static Linking & Dynamic Linking |
| Advanced CHAR Driver operations | Linux Kernel Build | Adding a static module to the kernel |
| Interrupt Handling | Installing an interrupt handler | Implementing a Handler |