INFOSOFT IT SOLUTIONS

Firmware Development

Microcontrollers

- Overview of 8051 architecture, Stack, Queues, Pipeline, Boot loader
- Application code area
- Secondary Boot loader.

Machine Level Programming

- Binary format
- Hardware storage methods.

Assembly Level Programming

- Op codes
- Mnemonics
- Assemblers Vs Compiler's
- Instruction sets.

ANSI Standard Embedded C & Advanced C Programming

- Why C? Why Not assembly/machine languages
- Fundamentals of C
- ANSI standards
- Industry Coding standards
- Hex file generation process

- Conditional statements, Loops, Functions, Arrays, Strings, Storage classes, Structures & union
- Enumerated data types
- Bit operations, Pointers
- Dynamic memory allocations
- File handling concepts
- Data structures, Array of pointers, Pointers and dynamic memory structures
- Union and structure uses differences
- Sorting and searching techniques
- Managing data in arrays
- Operations on arrays Vs strings
- Managing data in linked lists
- Testing of modules, Test drivers, test stubs
- Single linked lists operations,
- Doubly linked lists maintaining data, Stack, queue operations using arrays
- Linked lists queue using arrays
- Circular linked list
- Linear search, Binary search, Hash-based search
- Development tools and environment
- Creating make files
- GDB debugging of programs
- Development Tools and Environments
- Debugging techniques.

Mini Project

- Project on C and data structures.

Object Oriented Programming With C++

- Overview and Characteristics
- Function overloading
- Scope resolution operator
- Class in C++, Access Specifiers, Constructor, Destructor, Static members, Functions, Friend Classes, Friend Functions, Operator Overloading, Data Conversions,
- Inheritance, Polymorphism
- Exception Handling
- Templates
- Input and Output stream.

Microcontroller Programming

- Cross compilers
- Embedded C programming
- Embedded C debugging
- Memory models
- Library reference
- #pragma directives.

On Chip Peripherals

- Ports: INPUT/OUTPUT
- Timers/counters
- Interrupts, UART, Debugger.

Module 9: Externals Interface

- LED, LCD, Switches
- Seven segment display
- Keyboard Matrix, TFT LCD, Touch Screen.

Module 10: Common Protocols

- 12C, SPI

Module 11: Industrial Protocols

- CAN
- Modbus and SMBUS
- I2S
- Zigbee Wi-Fi, Bluetooth, GPS, GPRS, USB, Memory card, Ethernet.

Module 12: ARM

- Introduction
- Core features
- Version history
- Data flow model, Registers, CPU modes
- Memory organization, Interrupts, Pipelining
- ARM assembly language programming
- Addressing modes, ARM 7 instruction set, (20% 7 instruction set), (20/80%-rule of assembly language),
- Usage of kEIL IDE
- Demonstrating ARM ISA
- Demonstrating THUMB ISA,
- ARM embedded C languages Implementation,
- Exposure to an ARM7 CPU
- Core based microcontroller
- LPC2114-ARM based Microcontroller from Philips
- Semiconductors
- On-chip system peripherals bus Structure (AMBA)
- Memory map
- Phase locked loop
- VPB divider

- On-chip user peripherals
- General purpose I/O: demo, Using switch & LED, Vector interrupt controller (VIC), External interrupts demos.

Networking And TCP/IP Applications

- Network structure
- Classifications and Topologies
- Switching and routing
- Gateway, Repeater, Hub, Bridge, OSI layers, TCP/IP layers
- Physical and logical address, ARP & RARP, Internet protocol, Routing protocol and IP datagrams
- Error and Control Messages (ICMP) UDP
- Transfer Control Protocol
- TCP networking Applications, FTP, TFTP, TELNET, DNS, DHCP, SNTP, POP3, IMAP, SNMP.

Socket Programming

- Overview
- Concurrent processing
- Programming interface
- Socket interface
- Client/server design
- Concurrent connection-oriented servers
- Socket calls for TCP and UDP
- Single process
- Concurrent servers
- Implementation of TFTP/SMTP.