

# **NANO SCIENTIFIC RESEARCH CENTRE PVT.LTD**

AN ISO 9001:2008 CERTIFIED COMPANY



**Internet of  
Things (IOT)**

VECTOR ILLUSTRATION

## **ADVANCED DIPLOMA IN INTERNET OF THINGS (IOT)**



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## SYLLABUS COPY

- Introduction to IoT
- What is IoT
- IoT Architecture
- Internet of Things – Evolution
- Difference between M2M and IoT
- IoT : People connecting with Things
- IoT : Things connecting with Things
- Unlocking the massive potential of IoT
- IoT Applications
- IoT Technologies
- IoT based 2 Real time Projects implementation

## ADVANCED C

### Introduction

What is a program?, What is a programming language?, Evolution of C language, Features of C, Structure of a C program, Compilation and execution? Keywords in C, constants, variables, data types, Comments in C, Format strings, escape sequences, Basic I/O instructions

### Classification of operators

- Arithmetic operators
- Relational operators
- Logical operators
- Assignment operators
- Increment/Decrement operators
- Bitwise operators
- Conditional operator
- Other operators

- Functions
- Arrays
- Pointers
- Strings
- Structures and Unions
- Dynamic Memory Allocation
- Files
- Preprocessor

### Flow control instructions

- Decision Control Instructions
- If, if-else, if-else-if, nested if-else
- Loop control instructions
- for loop, while loop, do while, use of break and continue
- Selection Instructions : Switch



## SYLLABUS COPY

### OBJECT ORIENTED PROGRAMMING - C++

#### Introduction to C++:

1. Intro to Object Oriented Programming
2. Procedure Oriented Vs Object Oriented
3. Difference between C and C++
4. C++ Output/ Input
5. Keywords in C++
6. New Style of header files Specification
7. Comments in C++
8. Variables in C++

#### Classes and Object:

- a. Structures in C
- b. Structure in C++
- c. Access Specifier
- d. Classes
- e. Objects in C++

#### More on Classes and Objects:

- Dynamic Memory Management
- Constructor and Destructor
- Inheritance
- Virtual Functions and Inheritance
- Operator Overloading
- Constructor- Destructor Invocation
- Templates
- Exception Handling
- Working with input and output and files
- Basic understanding of standard template library
- the string of C++
- Miscellaneous concept of C++

### ROLE OF MICROCONTROLLER in IoT

#### Introduction to Microcontroller

- What is Microcontroller?
- Types of Microcontrollers
- Characteristics of an Microcontroller
- Applications of Microcontrollers

#### (8-bit) Microcontroller Architecture & Programming

- Block diagram and Pin description
- Ports
- Timers
- Serial communication
- Interrupts

#### Lab Sessions:

- Session 1: Software Introduction (Keil Micro vision), Project Creation
- Session 2: Port programming
- Session 3: Timer programming
- Session 4: Serial Communication
- Session 5: Interrupts
- Session 6: Practice

#### 89S52 interfacing with

- Session 1: Proteus Tool Session
- 2: Seven segment display Session
- 3: LED's
- Session 4: LCD (16\*2)
- Session 5: Keypad (4\*4)
- Session 6: LCD & Keypad
- Session 7: Keypad & Serial
- Session 8: ADC (0809)
- Session 9: DC Motor
- Session 10: Stepper Motor
- Session 11: Relay



# NANO SCIENTIFIC RESEARCH CENTRE PVT.LTD

## LINUX OPERATING SYSTEM

### Operating Systems

Learning of operating system concepts will help you in understanding Desktop, Embedded & Real-time Operating Systems easily in less time.

Introduction

Processes

Threads

CPU Scheduling

Process Synchronization

Deadlocks

Memory management

Virtual Memory

File management & Disk management

### Linux System programming:

Program, Process, Process IDs,

- Processes Priorities, Process States, CPU Scheduling
- Process Management API – fork, vfork, exec, wait and exit.
- Process Synchronization Techniques
- Semaphores, Mutex, Spinlock, Memory Barriers
- pthread programming and Thread Attributes
- Process Synchronization Techniques
- Semaphores, Mutex, Spinlock, Memory Barriers
- Inter Process Communication Techniques
- Pipe, FIFO, Signals, Shared Memory
- Timer API – Jiffies, Kernel Timers, wait queues, sleeps
- Interrupt and Exception API – Task lets, Work queues
- Kernel Debugging – kgdb, printk, jprobs, kprobs.

## Linux Network Programming for IoT Interface: ARM CORTEX-A SERIES

- ARM Architecture and ARM Processor family.
- ARM Development Boards and features.
- Raspberry Pi Development Board (ARM CORTEX A-72)
- Networking Architecture in Linux
- TCP / IP defector model and Layer in Kernel
- Client – Server Programming API
- Difference between TCP, UDP, RAW, UNIX, FTP, TFTP
- Wireless Architecture and Programming
- Boot loader Configuration and Compilation for ARM
- Kernel Configuration and Compilation for ARM.
- File System Configuration and Compilation for ARM.
- Porting Linux Ubuntu / Android OS on Development Boards

## QT CREATOR : BUILDING IoT APPLICATIONS

- Installing QT Framework.
- Application Development Using QT Creator.
- Sensors and modules Programming in QT Creator.
- Wireless Protocol Programming in QT Creator.
- Interfacing Pocket Sphinx with QT Creator.
- Creating HTML and HTTP pages for ARM Board.
- Setting Cross Compiler in QT for ARM.
- Executing Cross Compiled project file on ARM Board.

Address:

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## OUR RECRUTERS



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