

# WINTER TRAINING 2018-19



## GETTING STARTED

- History & need of Python
- Application of Python
- Advantages of Python
- Disadvantages of Python
- Installing Python

## PYTHON FUNDAMENTALS

- Working With Interactive Mode
- Working With Script Mode
- Python Character Set
- Python Tokens- Keywords, Identifiers, Literals, Operators
- Variables and Assignments
- Input and Output Functions in Python

## DATA HANDLING

- **Data Types**
  - Numbers
  - Strings
  - Lists
  - Tuples
  - Dictionary
  - Mutable and Immutable Data Types
- **Operators**
  - Arithmetic Operators
  - Relational Operators
  - Logical Operators
  - Operators Precedence
  - Evaluating Expression
  - Type Casting

## CONDITIONAL AND LOOPING CONSTRUCTS

- **If Statements of Python**
  - The if Statement
  - The if-else Statement
  - The if-elif Statement
  - Nested if Statements

- **Looping and Iteration**
  - The For Loop
  - The While Loop
  - Loop Else Statement
  - Nested Loops
  - Break and Continue
- **The Range Function**

## INTRODUCTION TO FUNCTIONS AND MODULES

- Using a Functions
- Python Function Types
- Structure of Python Modules
- Importing Modules in Python Programs
- Invoking Python's Built In Functions
- Working With Random Modules
- **User Defined Functions**
  - Structure of a Python Program w.r.t. UDF
  - Invoking UDF
  - Flow of Execution
  - Arguments and Parameters
  - Default Arguments, Named Arguments
  - Scope of Variables

## RASPBERRY PI BASICS

- What is Raspberry PI
- Hardware
- Ingredients
- Preparing & Installing Raspberry PI
- Connecting The Raspberry PI
- Basic Networking
- Shutting Down

## RASPBERRY PI PROCESSOR ARCHITECTURE

- SoC
- BCM2835 Multimedia Processor

- SoC in Raspberry PI
- Connecting Peripherals to PI Board

## GETTING STARTED WITH LINUX ENVIRONMENT

- Understanding Linux File System
- **Basic Linux Commands**
  - LS,CD,PWD,MKDIR,RMDIR,RM,CP,MV,TOUCH,CAT,
  - HEAD,TAIL,CHMOD,SUDO,DF,UNZIP,TAR,PIPE,MAN
  - GREP,HOSTNAME,IFCONFIG
- **Text Editors**
  - LEAFPAD
  - IDLE
  - VI
  - GVIM
  - NANO
  - VIM
  - EMACS

## GETTING READY FOR SOFTWARE

- Introduction to NOOBS and SD Cards
- NOOBS for Raspbian
- SD Card Formatter
- Downloading & Installing NOOBS

## GETTING STARTED WITH GPIO PROGRAMMING

- Led Programming
- Switch and Led Programming
- Interfacing Relay
- Motor Interfacing
- Motor Driver ICs
- Relay Drivers ICs
- Other Peripheral Interfacing
- 2+ Projects