

# Training Course and Syllabus

**Title: Python programming for Advance Learners**

**Contact Hours: 4 hours/ week**

**Objectives:** The trainee will be able to perform Advance Level Python Programming, explore the DJANGO framework, and implement the payment/ different APIs.

**Course Outcomes:**

- i. Have the skills and understanding of Python to confidently apply for Python programming jobs.
- ii. Gain expertise in Python standard library: Modules for file I/O, networking, web scraping, and regular expressions.
- iii. Explore advanced Python libraries: NumPy, Pandas, Matplotlib, and SciPy for data manipulation and analysis.
- iv. Learn Python to develop professional web applications, Learn Database connection and operations, APIs, DJANGO frameworks.

**Description:**

An Introduction to Python, Beginning Python Basics, Python Program Flow, Functions& Modules, Exceptions Handling, File Handling, Classes In Python, Generators and iterators, Data Structures, Collections, Writing GUIs in Python (Tkinter), Python SQL Database Access, Network Programming, Date and Time, Few more topics in-detailed, Regular Expression, Threads ESSENTIAL, Accessing API ESSENTIAL, DJANGO

**Project:** A Project with DJANGO framework.

**Title: Python programming for Beginners**

**Contact Hours: 4 hours/ week**

**Objectives:** The trainee will be able to write program and develop project with Python.

**Course Outcomes:**

- i. Have a fundamental understanding of the Python programming language.
- ii. Understand how to create your own Python programs.
- iii. Learn python Object-Oriented Programming (OOP) skills.
- iv. Acquire the pre-requisite Python skills to move into specific branches - Machine Learning, Data Science, etc.

**Description:**

An Introduction to Python, Basic Python Syntax, Language Components, Collections, Functions, Modules, Input and Output, Implementing Classes and Objects, OOP + Exceptions.

**Project:** Develop a project with Python

**Title: Web Design and Development**

**Contact Hours: 4 hours/ week**

**Objectives:** After completing the course the trainee can develop dynamic website using PHP, HTML, CSS, JavaScript, jQuery and MySQL

**Course Outcomes:**

- i. Use their learned skills, knowledge and abilities to develop web sites for the internet
- ii. Apply basic design principles to present ideas, information, products, and services on websites
- iii. Apply basic programming principles to the construction of websites
- iv. Effectively manage website projects using available resources

**Description:**

Impacts of internet, Internet structure protocols and access overview, Internet protocol model overview, Internet addresses, Internet protocols, Transport layer, Upper layer protocols, Internet access & applications; Router technology: introduction, network fundamentals, internet routing & new developments, router market, Web server, from internet, intranet to extranet; WWW Works: Hyper Text Transfer Protocol (HTTP); Web Servers; Web access; Related Web capabilities; WWW proxies; Future of the web; WWW technology, Introduction to HTML, XHTML, HTML5 and CSS.

PHP Overview, Exploring Data Types, Control Structures, Looping, User-Defined Functions, Debugging, Building Web Pages development, Environment, Core JavaScript Syntax, Types and Objects, DOM, Events and Event Listeners, Debugging JavaScript, JavaScript Libraries, JavaScript and HTML5, Advanced JavaScript Features, Understanding JavaScript Exception

Handling, Object-Oriented JavaScript, Tools and Tips for Developing and Debugging, Overview of JQuery, Working with Events, JQuery Animations and Effects, JQuery: Using the JQuery UI Plug-In, AJAX: Understanding the DOM and XML Formats, XML HTTP Requests, Previewing Links with AJAX, JQuery, Information System Analysis and Design, Database Design.

**Project:** A full features website project is necessary to complete the course

**Title:** C/C++/Java Programming for Beginners

**Contact Hours:** 4 hours/ week

**Objectives:** The trainee will be able to code with C/C++/Java

**Course Outcomes:**

- i. Acquire the basics of programming using essential blocks of C/C++/Java programming
- ii. Ability to write, compile and debug programs in C/C++/Java language
- iii. Formulate problems and implement algorithms in C/C++/Java
- iv. Understand the intricacies of loops, conditional statements, concept of functions and pointers, structure, and File handling.

**Description:**

Basic of Java/ C++/ C, Class, Objects, and Types of Classes, Packages, Data Types, Variables, Constraints, and Literals, Methods/ Functions, Constructor, Modifiers, Static Keyword, Final Keyword, Inner Class, Super and this keyword, Encapsulation, Inheritance, Polymorphism, Abstraction

**Project:** A assignment/ project is recommended

**Title:** C/C++/Java Programming for Advance Learners

**Contact Hours:** 4 hours/ week

**Objectives:** The trainee will be able to write advanced level program with C/C++/Java

**Course Outcomes:**

- i. Understand and apply the concept of abstract data type to represent and implement heterogeneous data structures.
- ii. Write programs using array-based lists, linked lists.
- iii. Analyze and implement different types of sorting algorithms.
- iv. Implement data structures for graphs and approaches for searching graphs using breadth-first, depth-first, best-first search, etc.

**Description:**

Basic of Java/ C++/ C; Class, Objects, and Types of Classes; OOPs concepts; Packages; Data Types; Variables, Constraints, and Literals; Methods/ Functions; Constructor; Modifiers; Static Keyword; Final Keyword; Inner Class; Super and this keyword; Encapsulation; Inheritance; Polymorphism; Abstraction; Garbage Collection; Input-Output Stream; Collections Framework; Serialization; Exception Handling; Annotations; Reflection; Array; String, String Buffer, String Builder; Thread; JDBC; Agile; Design Pattern; Database; Different Types of Core Java Frameworks: Spring; Hibernate; Struts (The Later Version); GWT (Google Web Toolkit); JSF (JavaServer Faces).

**Project:** Advanced level assignment or project is recommended.

**Title:** Mobile Apps Development on iOS

**Contact Hours:** 4 hours/ week

**Objectives:** The trainee will be able to develop mobile apps for iOS platform.

**Course Outcomes:**

- i. Explain the fundamentals of mobile application development with an in-depth understanding of architecture and design for application on iOS platforms
- ii. Implement development best practices
- iii. Discuss design patterns used towards solving common problems in application development
- iv. Efficiently create basic mobile applications

**Description:**

Fundamentals of iOS Apps Developments; Xcode and Interface Builder; Introduction to Platform Overview and Objective-C; Cocoa Touch Foundation and Tools; Windows, Views, and View Controllers (MVC); UIControls and ViewController Containers; Memory Management; Data Persistence and Accelerometer; Parsing XML and SQLite; Integrating with Core services – Email, Contacts, Camera, Map kit etc.; Profiling and live device testing; Quality Assurance

**Project:** iOS mobile app project

**Title: Freelancing and Digital Marketing**

**Contact Hours:** 4 hours/ week

**Objectives:** The trainee will gather the basic knowledge in freelancing and digital marketing.

**Course Outcomes:**

- i. Creation of various content like videos, blogs, podcasts, or social media posts
- ii. Social media marketing strategy and planning, Email marketing campaigns
- iii. Brand marketing, Maintenance of websites, blogs, and social channels
- iv. Search engine optimization (SEO) strategy and implementation

**Description:**

Fundamentals of Internet & Information Technology; Brief on Outsourcing; Freelancing Market Places; Finding Markets; Building Your Portfolio; Ways to Increase Your Earnings; Freelance Tools and Resources; Social Networking Sites; Tools, Add-On's & Extensions: Discussion on different SEO Tools; Backlink age, authority, popularity: Discussion on Backlinks; Search engine optimization (SEO); Content marketing; Inbound marketing; Social media marketing; Pay per click (PPC); Partner marketing; Native advertising; Marketing automation; Email Marketing; Online PR

**Project:** Recommend to submit analysis report/ assignment

**Title: Database Administration for Beginners**

**Contact Hours:** 4 hours/ week

**Objectives:** The trainee will acquire the basic knowledge in Database Administration

**Course Outcomes:**

- i. Understand the basic concepts and the applications of database systems.
- ii. Master the basics of SQL and construct queries using SQL.
- iii. Understand the relational database design principles.
- iv. Familiar with the basic issues of transaction processing and concurrency control including database storage structures and access techniques

**Description:**

Database fundamentals, Database management system, Database system application, Database system versus file system, View of data, Entity relationship data model, Relational data model, Database administration, Database system structure, Data dictionary, Entity sets, Relationship sets, Mapping Cardinalities, Keys, Attributes, Weak entity sets, Database Schema, Relational Algebra and SQL. Writing Basic PL/SQL statements, Single-Row-Functions, Displaying Data from multiple tables, aggregating data using Group Functions, Sub queries, Manipulating Data, Creating and Managing Tables including constraints, Controlling User Access, Declaring Variables, writing Executable Statements.

**Project:** A Database Design Project is recommended

**Title: IT Essentials for Office Management****Contact Hours: 4 hours/ week****Objectives:** The trainee will gatherer basic ICT knowledge and computer system operation**Course Outcomes:**

- i. Apply best practices to your work.
- ii. Confidently use Microsoft Office in the workplace.
- iii. Understand the essential skills employers expect in Word, Excel, PowerPoint, Email etc.
- iv. Learn the uses of tools and software for the workplace.
- v. Learn Hardware, Software troubleshooting.
- vi. Achieve confidence and job satisfaction through practice.
- vii. IP Configuration Wireless, LANs.

**Description:**

Introduction to the Personal Computer, Computer Operation & Assembly, Windows Installation, Configuration & Management, Network Concepts, Laptops & Mobile Devices, Hardware Troubleshooting (Printer, Projector, basic Computer), Office Application Packages (basic MS Word & MS Excel), Unicode Bangla Typing, Email, Internet Browsing, Personal Profile, Downloading, Internet and Wi-Fi connectivity, IP Addressing, Web Applications, Antivirus & Security, Automation System Operation.

**Project:** Final presentation and/or quiz is recommended**Title: Office Application & Computer Troubleshooting****Contact Hours: 4 hours/ week****Objectives:** The trainee will be able to operate the office application packages operation and computer troubleshooting**Course Outcomes:**

- i. Discuss basic computer concepts and definitions including locate and manage files and folders,
- ii. Create and save files in Microsoft Word, format, change page layout, create tables to organize information, place images in a Word document
- iii. Create and save a new presentation, edit and organize a presentation, add objects, change slide transition effects, add header and footer.
- iv. Using Excel, basic Formatting and layout, use Flash Fill and AutoSum, create and modify charts.
- v. Create database tables, work with fields set table primary key, work with tables, work with datasheets, sort and filter data.

**Description:**

Windows Desktop and its various components, Word Processing (Microsoft Word), Spreadsheet Analysis (Microsoft Excel), Presentation Software (Microsoft PowerPoint), Database software (Microsoft Access), Windows Desktop and its various components, Bangla writing using Unicode, Nikosh. Computer Maintenance & Trouble Shooting

**Project:** A final Presentation is suggested

**Title: Graphic Design and Multimedia****Contact Hours: 4 hours/ week****Objectives:** The perspective of the training is to create a professional graphics designer for the industry**Course Outcomes:**

- i. Analyze, synthesize, and utilize design processes and strategy from concept to delivery to creatively solve communication problems.
- ii. Apply graphic design principles in the ideation, development, and production of visual messages.
- iii. Identify and utilize design history, theory, and criticism from a variety of perspectives, including: art history, communication/information theory, and the social/cultural use of design objects.
- iv. Confidently participate in professional design practice and management within a collaborative work environment.

**Description:**

*Adobe Photoshop CS6:* Content-Aware Collection, Adjusting Levels, Sharpening Details, Creating and Formatting Text, Drawing Shapes, Layer Effects, Paragraph, Character, and Layer Styles, Scale, Rotate, Skew, and Warp, Liquefying an Image, Converting to Black & White, Printing an Image, Saving for the Web, Shortcuts and Settings, Smart Objects, Shadows/Highlights, Using Curves, Camera Raw, Color Range and Quick Mask, The Pen Tool.

*Adobe Illustrator:* Introduction of Illustrator, Working with the Control panel, Working with Documents, Selecting and Transforming Objects, Working with Color, Working with Fills and Strokes, Working with Paths, Creating Shapes, Using the Pen Tool, Using Type in Illustrator, Adjusting Appearance, Working with Layers, Working with Images, Creating and Using Symbols, Drawing in Perspective, Printing, Saving, and Exporting, Pattern Creation, Image Tracing, File Management.

*Canva:* Introduction to Canva, free-to-use online graphic design tool, create social media posts, presentations, posters, videos, logos and more; Curved text generator, Photo effects, Image enhancer, Add frames to photos, Add text to photos, Online video recorder, Video trimmer, Convert videos to MP4.

**Project:** Final project is recommended**Title: Networking Administration and ISP Setup****Contact Hours: 4 hours/ week****Objectives:** Industrial networking and ISP setup.**Course Outcomes:**

- i. Behavior of layer approach OSI, Concepts about Data Link Layer Protocols, Understanding Network Layer Protocols and IP Addresses.
- ii. Concept about TCP and UDP and Understanding TCP/IP protocol suit, Configuring TCP/IP client & Troubleshooting using TCP/IP utilities.
- iii. Using Linux Environment and Running shell, Using Linux File systems.
- iv. Administering User accounts, Administering Group accounts, Linux File systems, Editing File, Administering File and Folder permission.
- v. Administering Linux Filesystem,
- vi. Configuring DNS,DHCP Server, Administering File sharing (NFS,SAMBA,FTP), Configuring Web and web proxy (Apache,Squid), Configuring Mail Server(sendmail, postfix, webmail).

**Description:**

Network concept, Network Accessories, Network software, Network Protocol, Network topologies, Types of Network, OSI architecture, routing and IP address, communication by networking and its application, DLL: Error detection and correction, the channel allocation problem, Multiple Access Protocols, Ethernet, Wireless LANs, Broadband Wireless, Blue tooth etc., Routing Algorithms, Congestion Control Algorithms, Quality of service, Internetworking, Network Security, Web security. IP Addressing and Routing Protocols, Introduction and Installation of Linux, Hardware requirements for installation, Partitioning of hard Disk prior to installation, Classes of Installation - Simple Installation, Custom Installation, Structure of Linux File system, File System Navigation, Changing Directories, Listing Directory Contents, Examining File Contents, Examining the Contents of a File, Directory and File access permissions, Commands and Utilities like Find, SED, AWK, GREP/EGREP, Domain name systems (DNS) - Installation & Configuration, Samba Configuration, Sharing with NFS and NIS, Apache Web Server & its configuration, Dynamic Host Configuration Protocol FTP & Telnet-Installation & Configuration, Squid Proxy Server and its configuration, Handling Electronic Mail, Setting Up An Internet Site, Working With The Kernel, Backup And Recovery Procedures, Scheduling Jobs, Shell Scripting. Network Devices and Configuration, Network Testing and Troubleshooting, Internet and Web Technologies, ISP setup. Mikrotik Router OS, Basic & Advance Configuration and Management.

**Project:** A real life project is recommended

**Title: Mobile Apps Development on Android****Contact Hours: 4 hours/ week****Objectives:** The trainee will be able to develop the android mobile apps.**Course Outcomes:**

- i. Install and configure Android application development tools.
- ii. Design and develop user Interfaces for the Android platform.
- iii. Apply Java programming concepts to Android application development.

**Description:**

Installing the SDK tools on a Windows machine, Creating an Android Virtual Device (emulator), Installing Eclipse on a Windows machine, Installing the Android Development Tools, **Installing Android Studio**, Android App Fundamentals, The User Interface and Controls, Graphics and Styling, Supporting Multiple Screens, Animation and Graphics, Menus and Dialogs, Notifications and Toast, Working with Media, Preferences and Data Storage, Locations and Maps, Creating a Home Screen Widget, Publishing Application, Creating First Mobile App, Setting Up an Android Work Environment, Building a Mobile App from Scratch, Crafting a Form for Mobile, Advanced Features.

**Project:** A android mobile app project is essential to get the certification**Title: Networking and Server Administration for Beginners****Contact Hours: 4 hours/ week****Objectives:** To produce the beginner level networking professional**Course Outcomes:**

- i. Design and manage a computer network to include installing, configuring, securing and troubleshooting network devices, protocols and services.
- ii. Apply networking skills related to server operating systems, network security, directory services and administrative network security policy making.

**Description:**

Network concept, Network Accessories, Network software, Network Protocol, Network topologies, Types of Network, OSI architecture, routing and IP address, communication by networking and its application, Multiple Access Protocols, Ethernet, Wireless LANs, Broadband Wireless, Blue tooth etc., Quality of service, Internetworking, Network Security, Web security. IP Addressing and Routing Protocols, Introduction and Installation of Linux, Hardware requirements for installation, Partitioning of hard Disk prior to installation, Classes of Installation - Simple Installation, Custom Installation, Structure of Linux File system, File System Navigation, Changing Directories, Listing Directory Contents, Examining File Contents, Examining the Contents of a File, Directory and File access permissions, Commands and Utilities like Find, SED, AWK, GREP/EGREP, Domain name systems (DNS) - Installation & Configuration, Samba Configuration, Sharing with NFS and NIS, Apache Web Server & its configuration, Dynamic Host Configuration Protocol FTP & Telnet-Installation & Configuration, Squid Proxy Server and its configuration, Handling Electronic Mail, Setting Up An Internet Site, Working With The Kernel, Backup And Recovery Procedures, Scheduling Jobs, Shell Scripting. Network Devices and Configuration, Network Testing and Troubleshooting.

**Project:** Networking project with packet tracer