

Advanced Certificate Course on Computer Training (6 Months) Syllabus



জাতীয় কম্পিউটার প্রশিক্ষণ ও গবেষণা একাডেমী (নেকটার)
National Academy for Computer Training And Research (NACTAR)

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“Advanced Certificate Course on Computer Training” Course Module

এই কোর্স মডিউলটি ৬ মাস মেয়াদী “Advanced Certificate Course on Computer Training” এর জন্য নেকটার কর্তৃক তৈরীকৃত। মডিউলটি মোট ২১টি ইউনিট এ ভাগ করা হয়েছে, যার মধ্যে ২০টি ইউনিট কম্পিউটারের উপর এবং ১টি ইউনিট English এর উপর রাখা হয়েছে। কোর্স মডিউলটির উপর সপ্তাহে ৫ দিন হিসাবে ৬ মাসে মোট ৪০০ ঘন্টার ক্লাশ(পরীক্ষাসহ) রাখা হয়েছে।

কোর্স মডিউলটি নিম্নে ছকের মাধ্যমে দেখান হলো।

Advanced Certificate Course on Computer Training Syllabus (6 Months)

Unit	Course Title	Classes Hour
1.	Introduction to Computer	06
2.	Software & Operating System	06
3.	Operating System (Windows-7 or upper version)	10
4.	Word Processing (Office-2007 or upper version)	32
5.	Type practice using word processing (Bangla & English)	20
6.	Number System and Code	14
7.	Boolean Algebra and Logic Gate, Microprocessor and Digital Logic	20
8.	Input, Output, Memory device	12
9.	Spread Sheet Analysis (MS Excel: Office-2007 or upper version)	32
10.	Database Management System, MS Access: Office-2007 or upper version, with real time Project	36
11.	Microsoft Power Point (Office-2007 or upper version), Digital Content Development, Multimedia, GIF (Graphics Interchange Format) Software	28
12.	Program Design	06
13.	“C”; Programming Language	40
14.	Data Structure and Algorithm	08
15.	Data Processing, System analysis and design	06
16.	Web page Design Using Html	20
17.	Visual Basic	30
18.	Information Technology	06
19.	Data Communication, Network and Internet	26
20.	Computer Maintenance	16
21.	English	20
22.	Evaluation and Exam.	06
	Total Hour	400

Course Outline

01. Course Title : Six Months Computer Training Course
02. Course Duration : 6 Months
03. Computer Course : 310 Hours (3 hours par day, 5 days par week)
04. English Course : 50 Hours (1 hour per day, 3 days per week)
05. Evaluation and Exam. : 06 Hours

Course Title : Six Months Computer Training Course

Duration

Total Length : 6 months

Working hr. per day : 3 hours (5 days week)

Entry Qualification : Graduation Degree

Details of Course Module

UNIT 1

Introduction to Computer

History of Computer, Importance of Computer, Generation, Types of Computer, Definition of Hardware and Software. Basic hardware organization of a Microcomputer System.

UNIT 2

Software and Operation System

Software

Introduction to Software, Software classification, System software, Application software, Customized software.

Operating System

Introduction to Operating System, Importance of Operating system, Organization and, Classification of Operating System: Serial batch processing, Multiprogramming, Time sharing, Multiprocessing, Real time and Virtual storage Operating System; Distributed processing, Utility program, Job control program, Text based and Graphical User interface (GUI) Operating System. Micro computer Operating System: Single user, Single user Multitasking, Multi-user multitasking, Networking Operating System.

UNIT 3

Operating System (Windows 7 or Upper Version)

Operating System, Importance of an operating system, Introduction the features of windows 7, desktop icon, taskbar, menu bar, Clicking and dragging, Opening and closing windows, Minimize, Maximize, Restore Windows, Tool bar, Address bar, Customizing toolbars, Introducing Start menu options, Running program from start menu

Files and Folders

Drive, File, Folder, folders in a drive/Folder, Managing files, Copying a file, One folder to another folder, File/Folder searching.

Working with programs

Starting a program, Switching between open programs, Quitting a program that is not responding quitting a program

Customizing

Adding a program to the start of program menu, Removing a program from the start of program menu task bar.

Using windows accessories

Calculator, Notepad, Media Player, Volume control, Word pad.

UNIT 4

Word processing (Office 2007)

Introduction

Word Processing software, Application of a Word-processing software, Microsoft Word as a Word- processor, Familiarization of MS Word's working environment.

Text Editing

Creating a New Document, Typing text, Cursor movement, Inserting and deleting letter/word, Cut, Copy, Paste, Undo and Redo, Searching and replacing text. Spell and Grammar checking.

File Management

Saving and retrieving a file in different location, Difference between Save and Save As.

Text formatting

Applying different Font (Including Bangla) and Font Size, Bangla key Layout, Change case, Super script, Sub script, Bold, Underline, Italic, Drop case, Indenting, Line numbering, Word searching and formatting.

Table

Creating a Table, Merging cell, Inserting and Deleting Rows and Columns Borders and shading.

Insert

Inserting object, Special symbol, Picture (Clip Art, Word Art) Text Box, Date/Time, Page breaking.

Page Formatting

Paper selection, Margin setup, Page numbering, Header/Footer.

Printing

Printer selection, Print preview, printing a Document.

UNIT 5

Type practice using standard word processor.

UNIT 6

Number Systems and Code

Number Systems: Decimal, Binary, Octal, Hexadecimal Number System, Base/Radix of a number system, Conversation of Number from one base into another Base, Binary Arithmetic: Addition, Subtraction, Multiplication, Complements, Representation of signed numbers, Subtraction Using Complements Method.

Code

BCD, ASCII, EBCDIC, UNI code.

UNIT 7

Boolean Algebra, Logic Gates, Digital Logic and Microprocessor

Fundamentals Concepts of Boolean Algebra, Boolean Constants and variables, Postulates and Boolean Theorems, De-Morgan's Theorems, Boolean Logic operations: AND, OR, NOT, Simplification of Boolean expression, Truth table, Karnaugh Maps, Boolean expression Simplification using Karnaugh map method.

LOGIC GATES

Fundamental Logic Gates : AND, OR, NOT, Compound Logic Gates:NAND, NOR, EX-OR, EX-NOR; universality of NAND and NOR Gates, Logic circuit design using logic gates. Simplify Boolean expression using K-Map/Boolean Algebra and design simplified logic circuit.

Digital Logic and Microprocessor

Half and Full Adder Circuit, Encoder, Decoder, Combinational and Sequential Circuit, Sequential Logic Circuit, Flip-Flop, SR (Set-Reset), Introduction to Counter, Up-Down Counter.

Microprocessor

Functions of Microprocessors, Organization of a Microprocessor, Arithmetic/Logic Unit, Control Unit and Its Structure, Register, Addressing Modes, Instruction Execution, Fetch-Execute Cycle. RISC & CISC Processor, Parallel Processing: Pipe line processing

UNIT 8

Input/Output and Memory Devices

Input Devices: Keyboard, Mouse, Scanner, Punch card, OMR, OCR, MICR etc.
Output Devices: Monitor, Printer: types of printer, Plotter, Speaker etc.

Memory

Memory, Memory Organization and Classification Bit, Byte, Computer word, Primary Memory RAM, ROM, Cache Memory, Register, Secondary Memory: Hard Disk, CD-ROM, DVD, pen drive Magnetic Tape etc.

UNIT 9

Spreadsheet Analysis (MS-EXCEL Office 2007)

Introduction

Basic concepts of spread sheet Analysis, working with the excel program, Excel introduction, starting excel program, the application window, the document window, row, column, cell moving around the work sheet, Work book and Work sheet, Help Menu.

Creating a Worksheet

Concepts of label, value and formula, entering labels, values and formulas, creating a work book, saving and retrieving work book, Exiting the Excel Program.

Editing Skill

Working with ranges: erasing ranges, copying, cutting and pasting, filling ranges, working with cells, rows and columns, editing cell contents, clearing or deleting cells, rows and columns, clearing contents, formats of comments from a cell, the find command, the replace command, inserting or deleting cells, rows or columns. Spell checking.

Formatting

Using the auto format command, working with manual formatting, aligning labels and values, formatting numbers, dates and times, changing Font style and sizes, creating borders and shaded cells/tables modifying column and row size, alignment, indentation, line spacing, formatting sheets, rename, hide, unhide.

UNIT-10

Database Management System, MS Access (Office 2007) With real time project

Fundamental Concepts of Database Management System, Data Models, DBMS Structure, Entity, Attribute, Relationship, Entity Relationship Diagram (ERD), Mapping Constraints, Conversion of ERD into Tables. Client server and Distributed database.

Database Languages: DDL,DML,SQL,4GL

Relational Model: Structure of Relational Databases.

Data security : Data Security, Encryption, Decryption

SQL (Structure Query Language): Basic Structure, Set Operations, Aggregate Functions, Nested Sub Queries.

Microsoft Access

Learning the Access Essentials

Basic Concepts on Database, Data Information, Filed Record, Table, Concepts of object, Property, Method, Planning the Database Structure

Understanding Access Objects

Tables, Queries, Forms, Reports, Modules, Naming Conventions of the Access Object

Creation A Database and Its Objects

Creating a Database, Database File and Table

Creating a Table

Designing Tables, Working With the Table in Design View, Working With field Propertied, Naming Fields. Data Types, Setting Data Types, Concepts of primary and Foreign Key, Setting Primary Key, Multiple Field Primary Keys Indexes, Using The Table Wizard

Creating Queries

Queries, Creating Queries, Working With The Query Design Grid. Adding Fields to the Query Design Grid. Sorting Records Using Simple Query Wizard, Working With Queries Append, Make Table, Update, Delete Etc. Queries With SQL Statement.

Creating Forms

Understanding Forms, Working in Design View, The Components of a Form in Design View, Assigning Form properties, Modifying Form Properties to Create a Dialog Box,

Running Forms, Adding Controls And Setting Properties on Forms, Bound And Unbound Control, Adding Label, Command Button Combo Box, List Box, Quickly Creating Forms With a Wizard, Auto forms.

Creating Reports

Introducing Reports, Working With Auto, Reports, Using the Report Wizard Designing A Report, Viewing Report in Design View, Setting Reporting properties standardizing Reports, Inserting A chart into a Report with the Chart Wizard Printing Reports.

Organizing Information With Databases

Creation Form, Data Entry Using Form, Sorting Data, Data Validation, finding And Extracting Records using Different Criteria.

Printing And Managing Files

Printing With Excel: Setting Print Area, Clearing Print Area, The Page Setup Command, The Print Preview Command. Managing Files With Excel: Saving/Retrieving Files in Different Locations, Handling Multiple Files, Deleting Files.

Security Modes: Understanding Security Modes, Windows Authentication, SQL Authentication, User logins: Creating user logins, Managing logins Database-level Security: Database users, database roles

UNIT-11

Microsoft Power Point (Office 2007), Digital Content Development, Multimedia, GIF Software.

Microsoft Power Point(Office-2007):

Creating a Presentation: Creating a New Blank Presentation, Choosing Slide Layout, Use of Various Templates In Creating a Presentation, Saving, Closing and Opening an Existing a Presentation. Inserting New Slides in a Presentation, Deleting a Slide, Sorting the Slides, Inserting a Picture In To a Slide, Slide Show with Slide Show Menu, Inserting a Text Box In To a Slide. Insert & Modify Word Arts In To a Slide, Rotate Or Flip a Drawn Object In To a Slide. Changing Back Ground Color of a Slide, Applying Alignments to a Paragraph. Using Animation And Effects In to a Slide

Manipulating Text, Images & Slides: Bangle Writing In To a Slide. Changing The Font, Style & Font Size Bold, Italics, Underline & Case Changes, Inserting and Modifying Bullets & Numbering. Linking a Document In To a Slide. Drawing Auto Shapes and Word Arts. Creating a Table In To A Slide, Using Header and Footer In To a Presentation, Inserting Movies And Sounds In To a Slide. Using Cut, Copy And Past, Deleting a Selected Text and Image. Changing Slide Design, Changing Slide Background, Page Setup & Printing a Slide. Creating a Presentation by Auto Content Wizard, Using the Pack and Go Wizard.

Creating Digital Content using Microsoft power point.

Multimedia

Definition, Use of Multimedia, Digital Text, Graphics, Audio, Video, Components of a Multimedia System.

Graphic Interchange Format(GIF) Software

Edit GIF Animation and manage frames, Visual layer editing, Editing Frames, Quick create, Optimize, Preview animation.

UNIT-12

Program Design

Program, , Types of Programming Languages: Machine Language, Assembly Language, High Level Language, **Translator Program:** Compiler, Interpreter, Assembler; Steps of Programming, Algorithm, Flowchart, Pseudocode, Structured Programming, Object Oriented Programming Event Driven Programming, Visual Programming.

UNIT-13

“C” Programming Language

Concept of C Programming, C Programming Characteristics, C Characteristics Set, Identifiers and Keywords, Data Types, Constants, Variable and Array, Declarations, Statements, Operators and Expressions.

Input/Output Statement: Structure of C Program, Input/Output Statement:printf(), scanf(); gets(), puts(), getchar(), putchar().

Lab session: Writing simple c programs.

Control and Loop Statements: If-else statement, Switch Statement, Break Statement, Continue Statement, Comma Operator, and Go to Statement. Loop State: While Statement, Do-While Statement, For Statement, Nested Loops,

Functions: A Brief Overview, Defining a Function, Accessing a Function, Passing Arguments to a Function, Specifying Argument Data Types, Function prototypes, Recursion.

Lab session: Writing program using function.

Arrays: Defining an Array, Processing an Array, Passing Arrays to a Function, Multidimensional Arrays, Arrays and String.

Lab session: Writing program using array.

String Function: strlen(), strcat(),strcmp(),strcpy(),atoi() etc.

Lab session: Writing program using String Function.

Pointers: Fundamentals, Pointer Declarations, Operations on Pointers.

Lab session: Writing program using pointers.

Data Files: Opening and Closing a Data File, Creating a Data File, Processing a Data File.

Lab session: Writing program using Data Files..

UNIT-14

Data Structure And Algorithm

Data Structure, Array, Queue, Record, Tree, Pointer, Linked List, Application of Data Structures:

Sub-string, Concatenation, Length,

Lab session: Writing Program using C program

Insertion, Delete, Replacing, Indexing Etc,

Lab session: Writing Program using C program

Sorting: Sorting Algorithms, Selection, Bubble, Quick, Insertion.

Lab session: Writing Program using C program

Searching: Algorithms: Linear searching, Binary Searching
Binary.

Lab session: Writing Program using C program

UNIT-15

Data Processing , System Analysis and Design

Data & Information, Data Processing, Manual Data Processing, Data Processing Using Computer, Data Coding, Data Validation, System Tools, System Development Life Cycle(SDLC), System Development Tools: Data Flow Diagram, Decision Table, Decision Tree, System Flow Chart; Optimum System Analysis and implementation (Pay Roll, Result Sheet Salary Sheet etc.)

UNIT-16

Web Page Design using HTML

Basic concept of Web : World Wide Web, The Hypertext Concept, Web links, Webpage, Website, HTTP, URL.

HTML Syntax and Rules: Components, Elements, Attributes, Entities

Basic Document Structure : Labeling Document as an HTML Page, Standard Attributes, Body of HTML Document, HTML Comments, Saving and Viewing the page.

Adding a Document Header : Page Title, Meta Tags,

Adding text : paragraphs, Line break, Text Emphasis, Headings, Math and Science Notations, practice exercise.

Linking Text and Documents : Hyperlinks, Linking to Other files; Files in the same directory, Files in the another directory, Linking Email address , Linking within the same page, Linking to an Anchor in another page, practice exercise.

Create Lists : Bulleted (Unordered) Lists, Numbered (Ordered) Lists, Setting a Start Value, Setting type, Definition lists, practice exercise.

Table : Formatting Tables, Creating row & column, Joining row & column, Practice exercise.

Graphics : Adding Image, Adding Alternate Text, Adjusting the height and width, aligning text and images, Using Images as links, practice exercise.

Frames : Adding Columns, Working with rows, columns and rows, practice exercise.

Forms : Input, Text fields, Text area, Radio Buttons, Checkbox, Drop-down option, Submit and reset button, Label, practice exercise.

Receiving Form Data : Action Method, practice exercise.

UNIT-17

Visual BASIC

Introduction

Visual Programming, Visual Basic as a Programming Tools, Concepts of Properties, Methods And Events, Discussion on Project and Form, Running Visual Basic

Identifiers, Variables & Operators

Variable, Constants and Data Types, Mathematical Operator, Relational Operator and Logical Operator, Implicit and Explicit Declaration of Variables, Scope of Variables.

Modules

Form, standard and Class Modules

Working With Tool Box Command

Working With Text Box, Label, Combo Box, List Box, Option Button, Working With, Command Button, Check Box, Frame Control, Timer, picture Box, Simple Visual Basic Statement and Program Coding

Conditional Statement

If—Then—Else Statement, If—Then—Else if Statement, Select Case Statement.

Interaction (Loop) Statement

For—Next Loop, Do—While Loop, Do—Until Loop

Procedure and Functions

Sub Procedure, Function, Their Differences, Creating User Defined Procedure and Functions, Return Value of a Function, Function's Data Types.

Working With Database

Data Control and Its properties, Creating a Database (Ms Access), simple Data Input Form Designing,

Controls, Multiple Controls and Coding for Controls, Database Connectivity With Data Control

Creating Database Program With Visual Basic Code

Data Navigating, Move First, Move last, Move Next, Move Previous, Methods

UNIT-18

Information Technology

Chronological History of Information Technology, Transmission of Text, Telex, Tele text, Videotext, Computer mail System (CMMS) Voice Mail System (VMS), Electronic Mail, Transmission of Pictures. Teleconferencing, Videoconferencing, Facsimile Transmission, Micro-Graphics, Bulletin Board, Expert System, Voice Processing, artificial Intelligent, Effect of Information Technology in the Society.

UNIT-19

Data Communication, Computer Network and Internet.

Fundamentals of Data Transmission, Metallic Transmission Media, Optical Fiber, Unguided Transmission Techniques, Transmission System, MODEM and its Application.

Computer Network: Basic Concepts Types of Computer Networks Network Topology, Protocols the OSI Model, LAN, MAN, WAN,

Lab session: Cross & Street Cabling

PROTOCOLS:

Introduction to UDP, Remote Procedure Call, The Real-Time Transport Protocol

Introduction to TCP, The TCP Service Model, TCP Connection Establishment, Modeling TCP Connection Management, TCP Transmission Policy, TCP Timer Management, Wireless TCP and UDP, Transactional TCP

Lab session: Transmission Policy, TCP Timer Management

Internetworking: Internet Protocols, Routing Protocols

Intranet, xtranet, WIFI WIMAX, Cyber Security.

NETWORK SECURITY: Introduction to Cryptography, Substitution Ciphers, Transposition Ciphers, Two Fundamental Cryptographic Principles, DES--The Data Encryption Standard, AES--The Advanced Encryption Standard, SSL (Secure Socket Layer)

Lab session: DES, AES

PUBLIC-KEY: RSA

Lab session: RSA

DIGITAL SIGNATURES: Symmetric-Key Signatures, Public-Key Signatures, Message Digests

MANAGEMENT OF PUBLIC KEYS: Certificates, X.509, Public Key Infrastructures

COMMUNICATION SECURITY: IPsec, Firewalls, Virtual Private Networks, Wireless Security-SSID

Lab session: IPsec, Firewalls, Virtual Private Networks, Wireless Security

E-MAIL SECURITY: PGP—Pretty Good Privacy, PEM—Privacy Enhanced Mail, S/MIME

Lab session: PGP—Pretty Good Privacy, PEM—Privacy Enhanced Mail, S/MIME

WEB SECURITY: Threats, Secure Naming, SSL—Secure Sockets Layer, Mobile Code Security

Lab session: Threats, Secure Naming, SSL—Secure Sockets Layer

SOCIAL ISSUES: Privacy, Freedom of Speech, Copyright

UNIT-20

Micro Computer Maintenance and Troubleshooting

Basic Parts of a Microcomputer System, Main Boars and Multifunction Boards, Connection Procedure Among the Various Parts of a Micro-Computer System, stabilizer, UPS, Power noise: Spikes; Sugs, Surges, Over Voltage, Under Voltage Preventive Maintenance From the Power Noise, Heart Thermal Shock and dust, Virus and Virus Protection, Software Problem: Booting Problem, Device Driver Installation (Mouse, AGP, Printer), Configuring CMOS, HDD Maintenance, Common Faults diagnosis (Both Hardware & Software)

UNIT-21

English