SYLLABUS

For the trade of

COMPUTER OPERATOR AND PROGRAMMING ASSISTANT

Trade skill – I

Under

CRAFTS INSTRUCTOR TRAINING SCHEME

2012

Government of India
Ministry of Labour and Employment
Directorate General of Employment and Training
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
Salt Lake City, Kolkata

General Information

Objective of the course:

Objective of the Course is to create skilled work force for software developer and programmer. After successful completion of training program the following skills would be acquired:

- Acquired Knowledge on operation of computers and Internet Application.
- Database Management
- Front Office Management
- System Administration
- Assisting Programmer
- Network Administration
- Database Administration
- Computer Trainer

Training Methodology

- Interactive Pedagogy
- Class Room Training
- Practical Training
- Audio-Visual
- Role Play

Trade Skill-I

Entry Qualification

Pass in 12th standard with Science/Commerce/Arts only under 10+2 system and pass in COPA Trade under NCVT

Or

Recognized Diploma in Engineering of 3 years duration awarded by AICTE.

Unit strength

20 trainee

Space Norms

70 Sq. mtrs.

Power Norms

3.45 kW (Combined for Trade Skill-I and Trade Skill-II)

Duration of Training

3 months(12 weeks)-(40 hours/week)

Qualification for Training Officer

Passed 3 years Diploma in Computer Science / Engineering / Technology from recognized board or institution and CTI certificate with 2 years working experience in the relevant field.

OR

Passed MCA/ B-TECH/BE (Computer Science or IT or Computer Technology) / Msc in (Computer Science/ IT) from recognized university with 1 year working experience in the relevant field.

OR

Pass in Bsc Computer Science/ BCA / DoEACC A Level from recognized university with 2 years working experience in the relevant field.

Desirable

Preference to be given for CTI Certificate holders in related trade

SCHEME OF EXAMINATION

Subject	Maximum marks		Minimum marks	
Theory	100		60	
Practical	250		150	
Sessional	Theory(20)	Practical(30)	Theory(12)	Practical(18)
	50		30	
Total	**400**		**240**	

COPA CITS

Trade Skill-1 : 3 Months(12 Weeks)

Week	Theory	Practical
1	<u>Data Structure Through C</u> SORTING AND SEARCHING TECHNIQUES Bubble, Selection, Insertion, Shell sorts and Sequential, Binary, Indexed Sequential Searches,	Practicals on Data Structure On sorting & searching
1	Interpolation, Binary Search Tree Sort, Heap sort, Radix sort Analysis of Algorithms Algorithm, Pseudo code for expressing algorithms, time complexity and space complexity, O-notation, Omega notation and theta notation.	Practicals on Data Structure On sorting & searching
1	Stacks: LIFO structure, create, POP, PUSH, delete stack • Queues: FIFO structure Priority Queues, Circular Queues, operations on Queues	Practicals on Data Structure On Stack, Queue
2	Linear List Concept • List v/s Array, Internal pointer & External pointer, head, tail of a list, Null list, length of a list • Linked Lists o Nodes, Linked List Data Structure • Linked Lists algorithms o Create List o Insert Node (empty list, beginning, Middle, end) o Delete node(First, general case) o Search list o Retrieve Node, add node, Remove node, Print List o Append Linked List, array of Linked Lists	Practicals on Data Structure On Linked List Revision & Sessional Exam
2	Binary Trees o Travesals (breadth-first, depth-first) • Expression Trees o (Infix, Prefix, Postfix Traversals) • General Trees • Search Trees • Binary Search Trees	Practicals on Data Structure On Binary Tree
2	Terminology • Operations (Add vertex, Delete Vertex, Add Edge, Delete Edge, Find Vertex) • Traverse Graph (Depth-First, Breadth-First)	Revision on Data Structure programs

	• Graph Storage Structures (Adjacency Matrix, Adjacency List)	
3	Object Oriented Programming with Core Java Java Programming: Introduction to object oriented programming, Difference between C & Java, Java features., JVM. Simple Java program. Command line argument. Data type, type casting, operators (Arithmetic, increment, decrement. relalional, logical, bit wise, conditional) and expressions, Mathematical functions	Simple Programming on JAVA
4	Decision making and branching (if…else, else if, switch), looping, classes, class hierarchies, objects and methods, constructors, wrapper classes, nesting of methods, overriding methods. final class, visibility control,	Programming on JAVA on Control Structure Revision & Sessional Exam
5	Arrays, strings and vectors, Inheritance, interfaces, packages;	Programming on JAVA on Arrays
6	Multithreaded programming, extending thread, life cycle of thread, using thread methods, thread priority. Synchronization Exception-Handling fundamentals. Exception types. try, catch. throw, finally, user defined exception. Java applet	Programming on JAVA on Threading Programming on JAVA on Exception Handling
7	AWT controls (Button. Labels, Combo box, list and other Listeners), string handling (only main functions), graphic programming (line, rectangles , Circle. and ellipses).	Programming on JAVA on Applet and Frames using AWT Control
8	ASP.NET starting with Visual Basic .NET, Visual Basic.NET Fundamentals.	Creating Forms and Application of Theory part (On Initial Stage)
9	Working with Code and Forms, Variables and Procedures, Working with Controls	Creating Forms and Application of Theory part on a project (On Initial

		Stage)
10	Controlling Program Execution, Input Validation (and Testing of software Data Access using the ADO.NET data Control, Debugging, Error Trapping	Creating Forms and Application of Theory part on a project (On Initial Stage)
11	Application performance, Application Hosting and Application Security	Creating Forms and Application of Theory part on a project (On Initial Stage to be carried forward to next Module-II)
12	Revision & Final Test	Revision & Final Test

NOTE: THE PROJECT CAN BE DONE IN C OR JAVA OR ASP.NET / VB.NET

LIST OF TOOLS AND EQUIPMENTS

COMPUTER ORERATOR & PROGRAMMING ASSISTANT

(TS-I&II)

SNo	Tools and Equipments	Quantity
	HARDWARE	
1	Laptop: With i770 Intel Processor, 8 GB RAM, 1 TB HDD, WI-FI with license Operating or Higher System and Antivirus - 01 Nos.	1
2	3. WORKSTATION/NODES – i700 (i7) PROCESSOR or Higher 8 GB RAM or Higher 1 Terabyte HDD or Higher 22" TFT Monitor101 With wireless LAN Card DVD OR BLU-RAY WRITER KEYBORD/INTERNET USB Optical Mouse, USB Keyboard with latest license of OS and Antivirus - Professional/Ultimate Edition	20
3	WORKSTATION FOR MULTIMEDIA - 01 Nos. i700 (i7) PROCESSOR or Higher 8 GB RAM or Higher 1 Terabyte HDD or Higher With wireless LAN Card 22" TFT Monitor101 DVD OR BLU-RAY WRITER KEYBORD/INTERNET USB Optical Mouse, USB Keyboard with latest license of OS with Antivirus - Professional/Ultimate Edition	2
4	24 PORT SWITCH WITH WIRELESS CONNECTIVITY	As required
5	LAB should have Structured cabling	As required
7	Internet or Intranet Connectivity	As required
8	RJ 45 CONNECTORS	As required
9	CAT-6 CABLE FOR LAN	As required
10	500 VA or higher off – line UPS FOR NODES	22 No's
11	COLOUR LASER PRINTER	1 No
12	Network MONOCHROME LASER PRINTER	1 No
13	OPTICAL SCANNER (DESK TOP TYPE)	1 No
14	WEB CAM (DIGITAL CAMERA)	
15	DVD OR BLU-RAY WRITER	2 Nos
16	Standalone HARDDISKS	4 Nos

17	LCD PROJECTOR	1 No
18	Network Rack	2 Nos
19	LAN Setup	As required
20	Data Recovery Software	As required
21	DSL Wireless Router	01 No
22	Wireless Router	01 No
SOFTWARE		
	Software: OS, VISUAL STUDIO, Linux or any Open Source Software., Turbo C , JVM Antivirus for - clients / workstations in profile with validity of a year or more that can be procured on expiry. NOTE- LATEST VERSION OF HARDWARE AND SOFTWARE should be provided NOTE: ALL ABOVE WILL BE ACADEMIC VERSIONS EXCEPT FOR ANTIVIRUS	
LIST OF OTHER ITEMS/ FURNITURE		
1	Vacuum cleaner	01 No
2	Pigeon hole cabinet : 20 compartments	01 No
3	Chair and table for the instructor - 01 each (for class room & laboratory)	
4	Dual Desk or Chair and Tables for Trainees	10 Nos
5	Computer table sunmica top 150X650X750 mm with sliding tray for key board and one shelf of storage	22 Nos
6	Operators chair (without arms mounted on castor wheels, adjustable height	22 Nos
7	Wall clock	01 Nos
8	Printer table 650X500X750mm can be varied as per local specifications	03Nos
9	Window or Split type Air conditioners 1.5 tons	03Nos
10	Storage cabinet 60X700X450mm	01Nos
11	Inter active Board.	1 No.
12	2D Bar Code Reader	1 No.

For the trade of

COMPUTER OPERATOR AND PROGRAMMING ASSISTANT

Trade skill – II

Under

CRAFTS INSTRUCTOR TRAINING SCHEME

General Information

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Objective of the Course is to create skilled work force for software developer and programmer .After successful completion of training program the following skills would be acquired:

- Acquired Knowledge on operation of computers and Internet Application.
- Database Management
- Front Office Management
- System Administration
- Assisting Programmer
- Network Administration
- Database Administration
- Computer Trainer

Training Methodology

- Interactive Pedagogy
- Class Room Training
- Practical Training
- Audio-Visual
- Role Play

Trade Skill-II

Entry Qualification

Pass in 12th standard with Science/Commerce/Arts only under 10+2 system and pass in COPA Trade under NCVT and completion of Module – I of CITS

Or

Recognized Diploma in Engineering of 3 years duration awarded by AICTE.

Unit strength

20 trainee

Space Norms

70 Sq. mtrs.

Power Norms

3.45 Kw

Duration of Training

3 months(12 weeks)-(40 hours/week)

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Pass in Bsc Computer Science/ BCA / DoEACC A Level from recognized university with 2 years working experience in the relevant field.

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SCHEME OF EXAMINATION

Subject	Maximum marks		Minimum marks	
Theory	100		60	
Practical	150		90	
Project / Viva	100		60	
Sessional	Theory(20)	Practical(30)	Theory(12)	Practical(18)
	50		30	
Total	**400**		**240**	

COPA CITS

Trade Skill-2 : 3 Months (12 Weeks)

Week	Theory	Practical
1	NETWORK ARCHITECTURE: Layering & Protocols - OSI & Internet Architecture, Network topology - Link & Medium Access protocols, IEEE 802 standards, Performance issues Network Adaptors.	Practicals on Straight Cable, Cross cable & Network Interface card(NIC).
2	Circuit switching - packet switching - Internetworking - bridges - Internet protocol - Addressing - Routing Protocols. UDP - TCP- Congestion Control - Presentation aspects	Practicals on Switch, Router Configuration, LAN and WAN setup. Practicals on TCP/IP, CIDR.
3	APPLICATIONS: Telnet, FTP – e-mail - DNS - Multimedia Applications – Security NETWORK MANAGEMENT: Monitoring & Control - SNMP,V2,V3,RMON,RMON2	Practicals on Network Monitoring and Control (SNMP,V2,V3,RMON,RMON2).
4	INTERNETWORKING WITH ATM LAN - IP over ATM - Multiprotocol over ATM Frame Relay over ATM.	Practicals on LAN - IP over ATM, Frame Relay over ATM.
5	WIRELESS NETWORKS The wireless channel - Link level design - Channel access Network design - Standards. Optical Networks - Cross connects - LANS - Voice Over IP – Multimedia Networks.	Practicals on wireless Networking design , Voice over IP.
6	NETWORK SECURITY Authentication, Applications - Electronic Mail	Practicals on Network Security

	Security - IP Security - Web Security. SYSTEM SECURITY Firewalls - Current Standards.	(Authentication, Applications - Electronic Mail Security - IP Security - Web Security.)
7	Concept of System Analysis and Design, Testing	Manual Testing and Debugging Phases of Software development life cycle.
8	DATA BASE SYSTEM CONCEPT File systems - Database systems - Database systems architecture - Data models - Relational model - Hierarchical model - Network model - Entity-Relationship model - Data Dictionary - Database Administration and control.	Practicals on Introduction to DBMS & MSAccess ,Creating a new Database in Access Introduction to table structure Creating tables in Access (Through Wizard, Entering data and Design View). Start to make Project
9	RELATIONAL DATABASES Codd's rules - Base tables - Views - Domains and key concept - Integrity rules - Relational Algebra - Relational calculus - Commercial query languages. SQL ,PL/SQL Language.	Practicals on SQL ,PL/SQL in Oracle 11i / SQLServer RDBMS. SQL , PL/SQL Basic structure, simple & complex select statements. SQL * Plus Commands and Functions. DDL, DML commands, Group Functions, Sub queries, Joins. Project to be Continued
10	DATABASE SYSTEM DESIGN File and storage structures - Indexing and Hashing - Query processing - Database recovery – Concurrency control - Transaction processing - Security and Integrity.	Practicals on DATABASE SYSTEM DESIGN, Relational database design concepts, decomposition and normalization, integrity constraints. Project to be Continued
11	Presentation of the Project	Demonstration of the Project Note:- *All trainees are to store the works in a systematic and user friendly manner in the DVD for presentation.*
12	Revision & Final Test	Revision & Final Test

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9	Window or Split type Air conditioners 1.5 tons	03Nos
10	Storage cabinet 60X700X450mm	01Nos
11	Inter active Board.	1 No.
12	2D Bar Code Reader	1 No.

Note :- Tools and Equipment is common for both Modules I and II. Procurement be made only for One Module