



Mainframe Application Programming

Mainframe Application Programming Training Curriculum

Overview

The SkillZPro program offers training on Mainframe Application Programming. This comprehensive and intensive training program provides hands on experience on Live Mainframe Servers and covers from basic fundamentals of Mainframe to sufficiently advanced concept to make a person industry ready to enter the world of Mainframe.

Name of the Module	Duration
LSO	1 Day
TSO/ISPF	2 Days
JCL & UTILITIES	6 Days
COBOL	8 Days
VSAM & Access Methods	6 Days
DB2 Fundamentals	2 Days
SQL Workshop	3 Days
DB2 Application Programming	5 Days
CICS Fundamentals	2 Days
CICS Application Programming	5 Days
Project Case Study	5 Days
Total No. of Days	45 Days

LSO/TSO/ISPF

Overview:

Learn how to use Interactive System Productivity Facility (ISPF) for a z/OS environment. Receive an introduction and overview of using ISPF functions, and then reinforce the topics covered in lecture with hands-on lab exercises. Lab projects may be done in teams depending on the number of attendees and location.

Who Should Take This Course:

New users of Time Sharing Option (TSO) ISPF, application programmers, and individuals planning to use ISPF.

Objectives:

- Log on to TSO and invoke the ISPF/Program Development Facility (PDF) dialogs
- Use ISPF to allocate, rename, and delete datasets
- Use ISPF/PDF to edit, view, and browse datasets
- Use ISPF to create datasets
- Change/modify individual sessions
- Use System Display and Search Facility (SDSF) to review output from TSO batch-submitted jobs
- Use ISPF/PDF to compress datasets and move, or copy members between datasets

Prerequisites:

You should have the ability to:

- Identify the main hardware components of a computing system
- Identify the interconnection of the components of a computing system

Topics Include:

- Using TSO/Extensions (TSO/E)
- ISPF Browse, View, Edit
- ISPF Utilities
- Batch Job Processing
- ISPF Facilities

JCL and UTILITIES

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JCL and UTILITIES

Module 3: - Exec Statement

Parameters in Exec statement

Module 4: - DD Statement

Parameters in DD statement

Module 5: - Utilities

IEFBR14

IEBGENER

IEHPRGM

IEBCOPY

IEBUPDTE

SORT

MERGE

IDCAMS

Module 6: - Procedures

Instream procedure

Catalog procedure

Symbolic parameters

Overriding parameters

Module 7: - Condition

If-Else

Even

Only

Module 8: - Generation Data Group

Creation of Base GDG

Creation of Generations

Types of GDG

COBOL

Overview

This course presents the advanced features of COBOL. Topics include redefines, file update logic, table handling, copy libraries, control breaks, sort procedures, external subroutines, compiler options, passing parameters, and linkage editor.

Objectives

After completing this Course, the student will be able to -

- Construct Arrays
- Sort files
- Use embedded and external sub-programs
- Character Handling

Prerequisites

A Basic knowledge of Computing Concepts and a good working knowledge of any Programming Language.

Course Content:

Module 1: - Introduction to COBOL

Basic functions of COBOL

Module 2: - FILE HANDLING

Operations on files.

The sort instruction

Input-Output Procedures

Module3: - ARRAYS

The construction of single and multi-dimensional arrays

Searching and Sorting

Using Arrays for Translation

Module 4: - Sub Programming

Use of embedded and external sub program

Linkage Section

Parameter Passing

MVS VSAM & ACCESS METHODS

Overview:

Learn how to manage data sets by coding and using Access Method Services (IDCAMS) commands and by using the functions and features in Virtual Storage Access Method (VSAM). Hands-on lab projects may be done in teams depending on the number of attendees and location.

Who Should Take This Course:

Individuals responsible for managing data set using IDCAMS and VSAM.

Objectives:

Describe the organization and structure of VSAM clusters

Interpret and code IDCAMS commands

Code the Job Control Language (JCL) for use with IDCAMS and application programs which process VSAM clusters

Use IDCAMS and JCL options to improve the performance of a VSAM application job stream

Reorganize, back up, and recover VSAM and non-VSAM data sets

Prerequisite

You should complete:

Job Control Language and Utilities

Course Content

Module 1: - Introduction to VSAM files

KSDS

ESDS

RRDS

LDS

Module 2: - Using IDCAMS Utilities

Using IDCAMS utility to do all the operations in VSAM files

Module 3: - Alternate index

Creating Alternate Index & Using in Application Programs

MVS VSAM & ACCESS METHODS

Module 4: - Backup & Recovery

Using utilities to take backup and recovery
Parameters under Export and Import

Module 5: - Introduction to Buffers

Using buffers in an application program

DB2 FUNDAMENTALS

Overview:

This course provides you with information about the functions of Database 2 (DB2), IBM's relational database manager and addresses the DB2 family across the MVS and Universal Database platforms. This course includes a discussion of what services the DB2 products provide. It provides entry-level information to prepare you for the further courses in the DB2 curriculum.

Who Should Take This Course:

Anyone who needs introductory knowledge about DB2 functions.

Objectives:

List and describe the major elements of IBM's relational databases most components apply to all of the RDBMSs but technical details will be focused on DB2 for z/OS and DB2 UDB for Windows, UNIX, and OS/2

Describe the concepts involved in distributed data and some implementation considerations

Describe data warehousing and some of the products involved

Establish a base for more specialized DB2 education

Topics Include:

Module 1: - Introduction to database

Objects of DB2

Module 2: - Compilation Process

Components of DB2

Compilation process of COBOL-DB2 Programs

Module 3: - Introduction to SQL Queries

Creating a Table

Sub queries

Co-related Subqueries

Module 4: - Optimizer

Functions of Optimizer

Need for Optimizer

DB2 SQL WORKSHOP

Overview:

This course provides an introduction to the SQL language.

Who Should Take This Course:

Anyone who needs to perform SQL queries in practice, including end-users, programmers, application designers, database administrators, and system administrators who do not have knowledge of the SQL Data Manipulation Language (DML).

Objectives:

- Code simple and complex SELECT statements
- Code INSERT, DELETE, and UPDATE statements

Prerequisites:

None. However, if your database management system is DB2, you may want to attend DB2 Family Fundamentals before taking this course.

Topics Include:

- Basics of SQL - the Relational Language
- SQL Queries
- Comparison operators and multiple conditions
- Null data characteristics and selecting null data
- IN, BETWEEN, LIKE and negation in WHERE clauses
- ORDER BY and SELECT DISTINCT clauses
- Using calculated values in a SELECT and WHERE clause
- GROUP BY and HAVING clauses
- Column functions
- Scalar functions
- Joins
- UNION and UNION ALL
- Sub select
- Using arithmetic with time and date data
- INSERT, DELETE and UPDATE statements
- Creation of View, Synonym and Alias

DB2 APPLICATION PROGRAMMING

Overview:

Learn how to write an application program that incorporates SQL statements in a DB2 for z/OS environment and set up an application program test data environment.

Who Should Take This Course:

Programmers responsible for producing application programs that manipulate DB2 databases and future DB2 for z/OS application developers.

Objectives:

Embedded SQL statements in an application program in DB2 for z/OS

Prepare an application program for execution in DB2 for z/OS

Create TABLES, VIEWS, SYNONYMS, and INDEXES

Define TABLE CONSTRAINTS

Understand the concepts of STORED PROCEDURES

Prerequisites:

You should be able to code a program in COBOL or similar programming language. You should also take:

- DB2 Family Fundamentals
- DB2 SQL Workshop

Equivalent experience may be substituted for these courses.

Course content:

- DB2 for z/OS overview of the application program environment
- DB2 OBJECTS (create TABLE, SYNONYM, VIEW)
- Program Preparation
- CURSOR processing
- DB2 OBJECTS (Referential Integrity, INDEXES)
- Dynamic SQL
- STORED PROCEDURES concepts
- DB2 for z/OS Security for application programmers
- DB2 for z/OS Performance for the application programmer

CICS FUNDAMENTALS

Overview:

Learn how to describe major CICS concepts and facilities that are family of products. You will learn how CICS uses management functions and tables for transaction processing and on-line system management. This course also introduces the CICS Application Programming Interface (API) along with general guidelines and programming aids that supports application development. Hands-on lab exercises reinforce the lecture material.

Who Should Take This Course:

Information systems personnel with little or no CICS experience. This includes CICS application designers, application programmers, system programmers or operators. This course also provides the basic prerequisites to the CICS application and systems programming courses.

Objectives:

- Describe the role of CICS in a business transaction environment
- Explain the processing flow of a user transaction in terms of CICS management functions and their tables
- Describe the processes that support a CICS application program, including program preparation, map preparation, resource definition, and debugging
- Identify the purpose of selected CICS supplied transactions
- Describe the facilities that CICS provides for maintaining the integrity of data associated with CICS programs
- Describe the facilities available in CICS for intercommunication
- Describe CICS' role in a client/server environment
- Use selected CICS supplied transactions to modify the status of CICS resources

Prerequisites:

A basic knowledge of data processing. Applicable to the entire CICS.

Course content:

- CICS Introduction
- CICS Supplied Transactions
- Designing Maps
- Application Programming
- Recovery/Restart
- File and Database Facilities
- Data Queuing Facilities
- CICS Intercommunication
- CICS and the Client/Server Environment
- CICS Platforms
- Queuing Facilities of CICS

CICS APPLICATION PROGRAMMING

Overview:

Learn to design, code and debug modern Customer Information Control programs for e-business or traditional Information Technology (IT) environments. The course applies to the entire CICS family of products and provides extensive computer exercises in COBOL or PL/I.

Who Should Take This Course:

Application programmers and analysts, who design, code and debug CICS applications.

Objectives:

- Design and develop application programs for CICS environments
- Design applications with presentation logic separate from business logic
- Discuss the purpose of the CICS Clients
- Code CICS commands
- Pass and receive control to and from other program modules
- Prepare programs and run tests, including problem determination and resolution, using messages, and online interactive debugging tools
- Access and modify Virtual Storage Access Method (VSAM) files, DB2 databases, temporary storage and transient data queues
- Respond to normal and exception conditions from CICS commands
- Send and receive maps

Prerequisites:

A basic knowledge of CICS, which can be obtained by completing:
Introduction to CICS or
CICS Fundamentals.

Topics Include:

- CICS application programming environments
- Designing CICS applications
- Presentation logic alternatives
- Basic CICS commands
- LINK/DPL/ECI/EXCI commands for program to program control
- Map definition and usage
- CEDF/CEDX/CMAC/CECI/CEBR
- Reading and updating VSAM files and DB2 tables
- Creating and using TD and TS queues.

PROJECT and CASE STUDY

Participants will be doing any one projects & case study on the below modules.

Banking

Healthcare

Employee Maintenance System

For more information

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