fit for mainframe

COBOL Application Development for

- **System Programmers**
- **System-Related Staff**

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Content

1 Training Module Objectives

Upon completion of this module participants will know about the origins and importance of the COBOL programming language. They will be able to independently develop and test programmes within a mainframe environment using the programming language COBOL.

A skilful handling of TSO/ISPF will be required. TSO/ISPF is also one of the EMA blended learning module and can be booked as a package deal together with the COBOL module.

Further requirements are a good knowledge of programming logic and of algorithms. Participants already know how to programme and have some practical experience of at least one other programming language.

2 Information on EMA Blended Learning

There are two groups of training modules: mandatory and elective ones. Mandatory subjects are relevant for examination. Hence, in order to receive a certificate at the end of the training module, there has to be sufficient command of the knowledge imparted to be evaluated in tests, examinations and practical work.

Elective subjects can be studied on a voluntary basis and of course there will be qualified staff to answer corresponding questions. The average study workload for mandatory subjects is about ten hours a week, amounting to about 140 hours for a three-month module:

- Presence workshops ca. 15 hours
- Virtual classroom ca. 25 hours
- E-Learning ca. 60 hours
- Exercises ca. 40 hours

3 Content

Below the individual modules are described in detail. Numbers in brackets relate to the average amount of time needed for study.

3.1 Kick-off Workshop (1 day)

Presence Workshop
This one-day workshop serves as the basis for a successful cooperation during the entire training period. Depending on the participants' country of origin in takes place in Germany, Switzerland or Austria.

Duration **1 day**

Date **TBA**

Place **TBD**

Workshop Objectives

The presence workshop aims at three things:

- Participants and key-lecturers
- Participants get to know the most important e-learning tools, especially the virtual classroom.
- Participants get an initial overview of the seminar content.

Content

Introduction
Introducing participants
Introduction to the topic

Learning Efficiency
Learning and neurobiology research
Efficient learning

E-Learning & Blended Learning
Significance of e-learning
Advantages of Blended Learning
Integration of Web 2.0
Overview e-learning tools

Moodle Learning Platform
Learning platform overview
Structure of learning platform

Virtual Classroom
VC-Session objectives
How VC differs from traditional classrooms
Using the virtual classroom

Access to the Mainframe
EMA infrastructure
Accessing the IBM Computer

COBOL History and Background
How COBOL was developed
Significance of COBOL
Comparison with other languages
COBOL on the EMA-System under z/OS

Basic Structure and COBOL Programme Structure
Divisions, Sections, Paragraphs, Sentences
Hello World with COBOL

3.2 COBOL Data Declarations and Programme Constructs (ca. xx hours)

Sub-Module Objectives
Participants will know the basic structure of the COBOL Programme. They know how to define variables literals and constants, and they know the essential data types in COBOL. They know how to deal with the programme constructs in COBOL and they know the opportunities for applying selections und iterations.

Content

Review COBOL Basic Structure
Divisions, sections, paragraphs, sentences and statements

Data Declaration in COBOL (Basics)
Variables, literals and constants
Data types
Picture clause

Programme Constructs
Simple in/outputs in COBOL
Assignments with MOVE
Arithmetic in COBOL

Control Structures
Selection in COBOL
Iterations with COBOL

3.3 Handling of Files and Extended Declarations (ca. xx hours)

Sub-Module Objectives
Participants already know the possibilities to access sequential data. They know how to effectively use extended declarations. They know the possibilities VSAM offers, especially the processing of indexed-sequential file formats. They know how to create tables and search table content by programming. They identify and make use of the advantages in structuring programmes and they can integrate internal and external subroutines.

Content

Handling Sequential Files
Introduction to sequential files
Processing sequential data files

Data Declaration in COBOL (Advanced)
Edited pictures
USAGE clause
Writing into sequential files

Direct and Indexed File Access
Introduction to VSAM
Handling KSDS and RRDS Files

Tables
Handling tables
Creating tables
Searching in tables

Structured Programming
Handling subroutines (internal / external)

3.4 COBOL and the Access to DB2 Database (ca. xx hours)

Sub-Module Objectives
Participants can describe the most essential DB2 for z/OS key functions in connection with applications. They know the SQL basics and are able to set up a database environment interactively with SPUFI. They are able to access, retrieve and change DB2 data using COBOL programmes.

Content

DB2 Database Applications
Introduction to DB2

Introduction to SQL
Historical development
SQL Syntax
SELECT, INSERT, UPDATE, DELETE

Interactive SQL
Handling and using DB2I
SQL Processing Using File Input (SPUFI)
RDBMS interfaces
Static vs. dynamic SQL
Embedded SQL

Embedded SQL in COBOL
DB2 API for COBOL Programme
EXEC SQL and END-EXEC
Host variables in SQL statements
Host structures in COBOL
Handling DCLGEN
Preparing DB2 applications
(precompile, bind, compile)
Executing DB2 applications

Stored Procedures
Stored procedures concepts
SPs definition and execution

3.5 COBOL and Transactions with CICS (ca. xx hours)

Sub-Module Objectives
Participants will know how to plan and create CICS transactions using COBOL Programmes CICS. Thea are able to access DB2 databases with CICS transactions.

Content

Transaction Monitors
What are Transaction Monitors?
Market survey

Customer Information Control System (CICS)
Significance of CICS
CICS under z/OS
CICS components
CICS internal transaction
Resource definitions

CICS Applications
Applications and CICS
Basic mapping support
CICS and COBOL
CICS programme preparation
Test and debug

CICS und DB2
CICS-DB2 interfaces
Working with databases

3.6 Final Workshop (1 day)

Presence Workshop
During this one-day workshop we summarize results and answer open questions.

Duration **1 day**

Date **TBA**

Location **TBD**

Workshop Objectives

- Essential subjects and focal points are summarised.
- Participants answer comprehension questions asked by coaches / instructors in order to determine the current state of knowledge.
- Participants ask questions that came up during training.

