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Work Process Schedule and Related Instruction Outline

Overview

The following section contains work process, training outline, and related instruction for the **Mainframe System Administrator Apprenticeship**. The criteria are segregated into three distinct parts.

- **Part I: Work Process** – This section delineates the general outline of basic, high-level requirements that each participant will need to satisfy including projects, coaching, job shadowing, and training.
- **Part II: Outline of Related Instruction** – This section outlines specific formal training that each participant will be required to complete or demonstrate mastery.
- **Part III: Competencies and Performance Criteria** – In support of this competency-based apprenticeship model, this section identifies what technical knowledge and professional behaviors will be evident as a product of achieving proficiency in these areas.

Work Processes

Work Process
Orientation to the Work Environment. The apprentice will be introduced to leadership personnel. He/she will become aware of mission and business objectives. He/she will also gain exposure to required processes as well as business conduct, safety and security policies. Tips for succeeding in the workplace will be reviewed with him/her. Any system access will be given. The mentor will meet with the apprentice to assess prior learning and experience and determine specific training requirements for apprentice.
Specific Business Area Knowledge. The manager will provide the apprentice with a detailed overview of the organization's work process and how it relates to other organizations within the company.
Professional Development (Onboarding and Soft Skills Training)
Technical Foundational Training
Technical System Administrator Training
Job Shadowing/Mentoring
Formal/Informal Briefings
Performance Evaluations
On the Job Training:
1. Deploy and manage operating systems
2. Deploy and maintain other system software or products running on the mainframe
3. Implement monitoring, configuration management and reporting functions
4. Define and document best practices and support procedures; complete required documentation
5. Execute change management procedures including risk identification, test plans and back-out procedures
6. Implement system security procedures
7. Assist with capacity management and workload balancing
8. Code JCL
9. Write Simple REXX programs
10. Assist with disaster recovery plans
11. Assist with problem solving
12. Perform other duties as assigned

Competencies and Performance Criteria

Competencies

#	Type: Knowledge/ Skill/ Behavior	Description
1.0	B	Demonstrate key teamwork and collaborative behaviors
2.0	B	Demonstrate strong communication skills
3.0	K / B	Understand and model good feedback behaviors
4.0	B	Demonstrate a willingness to learn from mentors
5.0	K/B	Demonstrate a methodical approach to implementing change, adopting a risk mitigation approach
6.0	K/B	Demonstrate an ability to follow process and procedures with accurate and complete documentation
7.0	K	Demonstrate knowledge of key computer programming fundamentals including structured programming design and its relationship to data structures
8.0	K	Understand mainframe terminology and basic concepts
9.0	K	Understand mainframe hardware components and the structured nature of the mainframe I/O architecture
10.0	K	Understand access method concepts in MVS and the structure and design of VSAM files
11.0	K	Understand the associated software and system components that comprise a z/OS System, their purpose and how they interact
12.0	K	Understand the concepts and facilities of TSO and IBM's Interactive System Productivity (ISPF), including familiarization with the Editors
13.0	K	Understand the structure of ICF catalogs and the related VTOC and index VTOC
14.0	K	Understand hierarchical and relational DBMS
15.0	K	Understand the concepts, functions and facilities of CICS
16.0	K	Understand how security is implemented on the mainframe
17.0	K	Understand File Transfer tools, concepts and configuration
18.0	K	Understand how to use and exploit the additional utilities/ facilities/ program products widely utilized within an enterprise mainframe environment
19.0	K	Understand what can go wrong in a mainframe environment

20.0	S	Be able to code job control statements with sound syntax to execute Mainframe programs and access datasets following best practices and standards
21.0	S	Be able to create and use programs written in the REXX language
22.0	S	Be able to exploit utilities/ facilities/ program products widely utilized within an enterprise mainframe environment such as IEBGENER, IDCAMS etc.
23.0	S	Be able to define an HCD definition to create a z/OS LPAR and connect peripheral devices.
24.0	S	Demonstrate the use of SMP/E to manage the deployment and lifecycle of mainframe software products
25.0	S	Perform and upgrade of a major product in a production like environment, evaluating any risks and taking actions to mitigate/ minimize these risks via proven back-out plan and knowledge of what could wrong including effective testing.

Evidence Types

Evidence Code	Description
O	Observation
Q&A	Questions and answers
P	Learner products
RA	Reflective accounts / personal statements
S	Simulation
PD	Professional discussion
A	Assignments, projects, case studies
MT	Mentor testimony
EW	Expert witness evidence
RPL	Recognition of prior learning

Principles and Practices Performance Criteria

Job Role	z System Mainframe Administrator		
O*NET Code	15-1142.00 (Network and Computer Systems Administrators)		
Apprenticeship Level	Foundation		
Guided Learning Hours	320		
Experiential Hours	1680		
Competency Outcomes	Assessment Criteria	Evidence Type	Education Module Reference
1.0 Demonstrate teamwork and collaborative behaviors	1.1 Examples of teamwork and collaboration 1.2 Feedback from team members and mentors	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	
2.0 Demonstrate good communication skills	2.1 Examples of ability to present technical information clearly in both oral and written communications 2.2 Feedback from team members and mentors on ability to ask relevant questions	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	
3.0 Understand and model good feedback behaviors	3.1 Examples of giving and receiving feedback 3.2 Feedback from team members and mentors	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input type="checkbox"/> PD <input checked="" type="checkbox"/> A	

		<input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	
4.0 Demonstrate a willingness to learn from mentors	4.1 Feedback from mentors during progress reviews and “learning moments”	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	
5.0 Demonstrate the importance of using a standard approach to implementing change, adopting a risk mitigation approach	5.1 Evidence of following formal/informal change management procedures 5.2 Evidence of assessing risk when implementing changes and having risk effective mitigation plans for assigned projects 5.3 Evidence of developing a back-out plan for assigned projects 5.4 Evidence of a test plan when implementing new software/hardware changes	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input checked="" type="checkbox"/> RPL	
6.0 Demonstrate an ability to follow process and procedures with accurate and complete documentation	6.1 Evidence of knowledge of processes and procedures and know where to locate documented procedures as required 6.2 Create documentation related to implementation of processes and procedures for new or existing implementations 6.3 Evidence of documentation of technical procedures for internal users or clients	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input checked="" type="checkbox"/> RPL	

Knowledge Performance Criteria

Competency Outcomes	Assessment Criteria	Evidence Type	Education Module Reference
7.0 Demonstrate basic understanding of structured programming design and its relationship to data structures	7.1 Demonstrate an understanding of pseudocode. 7.2 Demonstrate an understanding of variables, operators, constants and data types. 7.3 Demonstrate an understanding of functions, parameters and recursion. 7.4 Demonstrate an understanding of arrays. 7.5 Demonstrate an understanding of APIs.	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	AP Computer Science Principles
8.0 Demonstrate basic understanding of Mainframe terminology and basic concepts	8.1 Describe and compare various System z components: 8.1.1 Frame layout and cage usage 8.1.2 Server models, books, memory, and cache structure 8.1.3 Performance and millions of service units (MSUs)	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	IBM z/OS Mainframe Practitioner
9.0 Demonstrate basic understanding of mainframe hardware components and the structured nature of the Mainframe I/O architecture	9.1 Describe what IBM Z physical components are used when processing instructions and performing an I/O operation 9.2 Describe the CoD provisioning architecture and which servers can use it 9.3 Describe how logical partitioning is used, resource assignments 9.4 Describe mainframe channels, usage, and CHPID assignments 9.5 Describe the purpose and use of HCD 9.6 Identify mainframe operating systems and their supported	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	IBM z/OS Mainframe Practitioner

	<p>mainframe servers</p> <p>9.7 Describe the various queues that are used to dispatch work</p> <p>9.8 Describe the difference between a base and Parallel Sysplex</p> <p>9.9 List Parallel Sysplex main characteristics</p> <p>9.10 Describe the purpose and use of the coupling facility</p> <p>9.11 Identify processor architectural modes and their supported addressing implementations:</p> <p>9.11.1 Address spaces</p> <p>9.11.2 Virtual addressing</p> <p>9.11.3 Storage usage</p> <p>9.12 Use system commands to display active address spaces and identify their current status</p> <p>9.13 Describe the high level interaction between z/OS, CSS, and I/O devices during I/O processing</p> <p>9.14 Describe the role of the HMC and SE for System z servers</p> <p>9.15 Identify and change the HMC user interface style</p> <p>9.16 Identify CPC and image objects usage on the HMC</p> <p>9.17 Locate the documentation that List program management services that z/OS provides</p> <p>9.18 Locate the documentation that List main elements and optional features of the z/OS system</p> <p>9.19 Explain system libraries, their use, and methods for managing their content</p> <p>9.20 Describe the responsibilities of JES</p> <p>9.21 Describe the use of traditional DB/DC applications like CICS, IMS, and DB2 on z/OS</p> <p>9.22 Describe the purpose of the Language Environment</p> <p>9.23 Describe the support provided for object-oriented application development on z/OS</p> <p>9.24 Explain the differences between authorization and authentication</p> <p>9.25 Describe the Lightweight Directory Access Protocol (LDAP)</p> <p>9.26 Describe the purpose and benefit of z/OS Management Facility</p>		
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	<p>9.27 List SDSF commands used to display jobs, active users, and tasks</p> <p>9.28 Demonstrate knowledge of how to filter SDSF output based on DEST, PREFIX, OWNER and SYSNAME</p> <p>9.29 Describe the main features of UNIX System Services (USS) in z/OS</p> <p>9.30 Describe briefly the UNIX shell and utilities</p> <p>9.31 Describe the hierarchical file system Describe the application services provided in USS</p> <p>9.32 Describe how to start and manage a process in USS</p>		
10.0 Demonstrate basic understanding of access method concepts in MVS and the structure and design of VSAM files	<p>10.1 Discuss VSAM data set creation through JCL</p> <p>10.2 Describe the following data sets and how they are used and accessed (random or sequential):</p> <p>10.2.1 KSDS</p> <p>10.2.2 ESDS</p> <p>10.2.3 RRDS</p> <p>10.2.4 LDS</p>	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	IBM z/OS Mainframe Practitioner
11.0 Demonstrate basic understanding of the associated software and system components that comprise a z/OS System, their purpose and how they interact	<p>11.1 Demonstrate example of how z/OS provides support for On Demand Business</p> <p>11.2 Describe how security is ensured in a z/OS environment</p> <p>11.3 Characterize the major products and facilities that support z/OS systems</p> <p>11.4 Describe z/OS connectivity, communication facilities, and interfaces</p> <p>11.5 Describe how zEnterprise creates a single system of systems</p> <p>11.6 Describe the concept, strategy, and benefits of the z/OS environment</p> <p>11.7 Describe security support provided by z/OS</p> <p>11.8 Describe the different types of Systems Management support (SMP/E, SMF, and RMF)</p> <p>11.9 Describe the scalability, availability, backup, and recovery features in z/OS</p>	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	IBM z/OS Mainframe Practitioner

	11.10 Describe System Services support (storage management, job management, work management, data sets, and data set management)		
12.0 Demonstrate basic understanding and application of the concepts and facilities of TSO and IBM's Interactive System Productivity (ISPF), including familiarization with the Editors	12.1 Log on to TSO and navigate through ISPF/PDF dialogs and use the basic ISPF/PDF functions and the ISPF Editor 12.2 Use ISPF/PDF to allocate data sets and edit data sets (including hierarchical file system replace with ZFS as previously stated bfiles) using the ISPF Editor primary and line commands 12.3 Use ISPF to create and manipulate (copy, rename, delete, list, sort, and merge) data sets 12.4 List attributes of TSO/E 12.5 Name the three data set types 12.6 Describe the attributes of data set names 12.7 Use line and prefix commands while editing data set 12.8 Describe and use TSO/E commands 12.9 Invoke a REXX exec and TSO CLIST 12.10 Invoke UNIX processes 12.11 Manipulate HFS directories and file systems using the UNIX SystemServices ISHELL	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input checked="" type="checkbox"/> S <input type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	IBM z/OS Mainframe Practitioner
13.0 Demonstrate basic understanding of the structure of ICF catalogs and the related VTOC and index VTOC	13.1 Describe the classical z/OS data management 13.1.1 DASD init: VTOC, VTOC index 13.1.2 ICF catalog creation: BCS, VVDS 13.1.3 MCAT/UCAT 13.1.4 IDCAMS utility 13.1.5 DFSMS: DFSMSdss, DFSMSHsm 13.1.6 Data, storage, and management classes 13.1.7 Define a zFS file system	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	IBM z/OS Mainframe Practitioner
14.0 Demonstrate basic understanding of the hierarchical and relational DBMS	14.1 Explain how databases are used in a typical online business. 14.2 Describe two models for network connectivity for large systems 14.3 Explain the role of DB2 in online transaction processing 14.4 List common DB2 data structures 14.5 Describe how SQL works on z/OS	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A	Db2 Fundamentals V11 Introduction to IMS

	14.6 Give an overview of application programming with DB2 14.7 Explain what the IMS components are 14.8 Describe the structure of the IMS DB subsystem	<input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	
15.0 Demonstrate basic understanding of the concepts, functions and facilities of CICS	15.1 Describe the role of large systems in a typical online business 15.2 List the attributes common to most transaction systems 15.3 Explain the role of CICS in online transaction processing 15.4 Describe CICS programs, CICS transactions, and CICS tasks 15.5 Discuss the CICS IMS components	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	IBM CICS Video Course Series
16.0 Demonstrate basic understanding of how security is implemented on the mainframe	16.1 List and describe the basic features and concepts of zSeries architecture and of the z/OS operating system as they relate to security administration 16.2 Identify the security requirements of a system 16.3 Describe the components of network security 16.4 Describe how security is handled in USS 16.5 Use the basic facilities and features of the implemented security product 16.6 Use the security product to define users and protect resources	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input checked="" type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	IBM z/OS Mainframe Practitioner
17.0 Knowledge: Have a basic understanding of file transfer tools, concepts and configurations	17.1 Connect to a remote host to get/put files 17.2 Describe Managed File Transfer including auditability, security, recoverability and platform connectivity.	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	IBM z/OS Mainframe Practitioner
18.0 Have a basic understanding of how to use and exploit the additional utilities/ facilities/	18.1 Describe the system initialization process of the z/OS operating systems 18.2 State the differences between an address space, data space,	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA	IBM z/OS Mainframe Practitioner

<p>program products widely utilized within an enterprise mainframe environment</p>	<p>and hyperspace</p> <p>18.3 Describe the basic process of translating a virtual address to a real address</p> <p>18.4 Explain the difference between paging and swapping</p> <p>18.5 Describe how a z/OS task is created</p> <p>18.6 Describe dispatching, interrupt processing, supervisor calls, cross memory services, and serialization</p> <p>18.7 Describe the purpose of the Job Entry Subsystem (JES)</p> <p>18.8 Illustrate the flow of a job through the z/OS environment</p> <p>18.9 Describe the allocation process for data sets in the z/OS environments</p> <p>18.10 Illustrate how an I/O request is processed in a z/OS environment</p> <p>18.11 Describe how workload management is accomplished in a z/OS environment</p> <p>18.12 Explain the z/OS recovery processes and list available Problem Determination Tools</p> <p>18.13 Describe z/OS storage management concepts</p> <p>18.14 Describe the UNIX System Services functions provided in the z/OS environments</p> <p>18.15 Explain the network topologies and protocol support provided in z/OS</p>	<p><input type="checkbox"/>S</p> <p><input type="checkbox"/>PD</p> <p><input checked="" type="checkbox"/>A</p> <p><input checked="" type="checkbox"/>MT</p> <p><input checked="" type="checkbox"/>EW</p> <p><input type="checkbox"/>RPL</p>	
<p>19.0 Demonstrate basic understanding of what can go wrong in a mainframe environment</p>	<p>19.1 Select the appropriate IBM publication to provide further technical information (SRLs, Technical Bulletins, Self-study and other z/OS courses)</p>	<p><input checked="" type="checkbox"/>O</p> <p><input checked="" type="checkbox"/>Q&A</p> <p><input type="checkbox"/>P</p> <p><input checked="" type="checkbox"/>RA</p> <p><input type="checkbox"/>S</p> <p><input checked="" type="checkbox"/>PD</p> <p><input checked="" type="checkbox"/>A</p> <p><input checked="" type="checkbox"/>MT</p> <p><input checked="" type="checkbox"/>EW</p> <p><input type="checkbox"/>RPL</p>	<p>IBM z/OS Mainframe Practitioner</p>

Skills Performance Criteria

Competency Outcomes	Assessment Criteria	Evidence Type	Education Module Reference
20.0 Demonstrate basic understanding and ability of how to code or update job control statements with sound syntax to execute mainframe programs and access datasets following local practices and standards	20.1 Use JOB, EXEC, DD and COMMENT statements in a multistep job 20.2 Explain JCL errors, return codes, and ABENDs 20.3 Use the functions of system and data set utility programs 20.4 Use the COND parameter and conditional execution of job steps 20.5 Use various record formats supported by z/OS 20.6 Use blocked and unblocked data sets 20.7 Discuss system-determined block size 20.8 Awareness of SMS-managed data sets Differentiate between PDS and PDSE data sets 20.9 Describe a procedure 20.10 Differentiate between a cataloged procedure and in-stream procedure 20.11 Describe procedure modifications through overriding, adding, or nullifying parameters 20.12 Compare the PROC and EXEC statements for supplying symbolic parameters 20.13 Code or identify and describe basic JCL statements using proper syntax and coding rules, including JCL for: 20.13.1 Creating new data sets 20.13.2 Referencing existing data sets 20.13.3 Condition code testing 20.13.4 IF/THEN/ELSE/ENDIF constructs 20.13.5 Generation data groups 20.13.6 Output routing	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	IBM z/OS Mainframe Practitioner

	<p>20.13.7 Invoking a program and passing PARM parameters 20.13.8 Using the DISP parameter</p> <p>20.14 Identify Storage Management Subsystem requirements and: code or identify and describe in an existing job: 20.14.1 instream and cataloged procedures 20.14.2 symbolic parameters in procedures 20.14.3 procedure overrides and additions super 20.14.4 selected utility programs 20.14.5 tape processing facilities</p> <p>20.15 Code or identify the sort and merge control statements and associated JCL statements</p> <p>20.16 Tailor existing JCL and submit batch jobs</p> <p>20.17 Use symbolic parameters to modify procedures</p> <p>20.18</p>		
21.0 Demonstrate basic understanding of and ability on how - to create and use programs written in the REXX language	<p>21.1 Write and execute a program using the REXX language using various data parsing techniques and built-in REXX functions</p> <p>21.2 Create user-defined internal and external functions and subroutines</p> <p>21.3 Issue host commands from within REXX execs</p> <p>21.4 Code programs that read and write data sets</p> <p>21.5 Use instructions and commands that manipulate the data stack</p> <p>21.6 Explain how a CLIST differs from a REXX exec</p>	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	z/OS REXX Programming Workshop
22.0 Demonstrate basic understanding to know when to exploit IBM utility programs such as IEBGENER, IDCAMS etc.	<p>22.1 Demonstrate an understanding of the utility control statements appropriate for: 22.1.1 IEBGENER 22.1.2 IEBTPCH 22.1.3 IEHLIST 22.1.4 IDCAMS</p>	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	IBM z/OS Mainframe Practitioner
23.0 Demonstrate basic knowledge of HCD	<p>23.1 Identify and discuss the HCD definition process sequence</p> <p>23.2 Demonstrate how the HCD dialogs are used to define a configuration</p>	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P	z/OS System Services Structure

	<p>23.3 Demonstrate knowledge in how to connect peripheral devices</p> <p>23.4 Assist with the connection of peripheral devices when possible</p>	<input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	
24.0 Demonstrate basic understanding of the use of SMP/E to manage the deployment and lifecycle of mainframe software products	<p>24.1 Use the SMP/E dialogs to install a product and its related service</p> <p>24.2 Manage exception SYSMOD data</p> <p>24.3 Use primary and secondary data sets as required by SMP/E</p> <p>24.4 Analyze output from SMP/E processing and resolve commonly encountered problems</p> <p>24.5 Use the REPORT command to determine software dependencies between zones</p> <p>24.6 Use the BUILDMCS process to create a function SYSMOD from an installed product and its service</p> <p>24.7 Use SMP/E functions to install software service automatically over the internet</p> <p>24.8 Implement support for communication server FTP client</p> <p>24.9 Use the RECEIVE ORDER command to order and install z/OS maintenance automatically over the Internet</p>	<input checked="" type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input checked="" type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	SMP/E for z/OS Workshop
25.0 Demonstrate basic understanding of how to Perform and upgrade a major product in a production	<p>Demonstrate basic knowledge of:</p> <p>25.1 Implementation plans</p> <p>25.2 Risk assessments</p> <p>25.3 Back out plans</p> <p>25.4 Test plans</p> <p>25.5 Change management processes to execute the implementation plan</p>	<input type="checkbox"/> O <input checked="" type="checkbox"/> Q&A <input type="checkbox"/> P <input type="checkbox"/> RA <input type="checkbox"/> S <input checked="" type="checkbox"/> PD <input type="checkbox"/> A <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> EW <input type="checkbox"/> RPL	SMP/E for z/OS Workshop

Outline of Related Instruction

Foundational Instruction

Training	Type	Formal Training Hours
Onboarding and Softskill/Business Software Training	ANY	50
AP Computer Science Principles <ul style="list-style-type: none"> • Algorithms • Data structures • Software Engineering • Writing Computer Programs 	Online	10
Master the Mainframe Part 1 & 2	Online	25
IBM z/OS Mainframe Practitioner: (3 courses) <ul style="list-style-type: none"> • Introduction to IBM z/OS Mainframe • Introduction to Mainframe with z/OS Commands and Panels • Systems Programming on IBM Z 	Multiple	50
z/OS REXX Programming Workshop <ul style="list-style-type: none"> • Writing functions and subroutines • Debugging and error handling • Executing host commands • Compound variables and the data stack • Reading and writing data sets in REXX • The parse instruction • REXX: REXX compiler, REXX in batch, MVS console commands 	Multiple	36
Db2 Fundamentals V11 IBM CICS Video Course Series Controlling CICS Operations CICS Concepts and Operation Assessment 5.3 IMS Fundamentals	Multiple	30
IBM z/OS V2R2 Communications Server TCP/IP Implementation: Volume 2 Standard Applications (Chapter 3)	Self-Study Reading	7

System Administrator Instruction

Training		Formal Training Hours
z/OS System Services Structure <ul style="list-style-type: none"> • Operating environment initialization • Task management • Addressability • Input/Output supervisor • Storage management • Recovery termination manager 	Multiple	36
SMP/E for z/OS Workshop <ul style="list-style-type: none"> • SMP/E as a tool for system maintenance • SYSMOD, REPORT, BUILDMCS, RECEIVE, ORDER • Install products and services • Primary and secondary data sets • SMP/E problem resolution 	Multiple	36
Master the Mainframe Part 3	Online	40
Total		320

Note: Multiple means available in either Virtual or Classroom formats from providers.