COBOL

Course outline

Module 1: Introduction to COBOL

Module 1: Introduction to COBOL is an introductory course designed to provide students with a basic understanding of the COBOL programming language. This module covers the fundamentals of COBOL, including data types, control structures, and file handling. It also introduces the concepts of structured programming and debugging. By the end of this module, students will have a solid foundation in the fundamentals of COBOL and be able to write basic programs.

Lessons

- Overview of COBOL language
- COBOL Syntax and Structure
- Working with Data Types and Variables
- Writing COBOL Programs
- Working with Control Structures
- Working with Tables and Arrays
- Working with Subprograms
- Working with File Processing
- Debugging and Troubleshooting COBOL Programs
- Introduction to Object-Oriented COBOL

After completing this module, students will be able to:

- Understand the basic syntax and structure of COBOL programming language.
- Write and debug simple COBOL programs.
- Use COBOL data types, variables, and constants.
- Utilize COBOL control structures such as IF-THEN-ELSE, PERFORM, and GO TO.

Module 2: Data Types and Variables

Module 2 of the COBOL course covers the fundamentals of data types and variables. It introduces the different types of data available in COBOL, such as numeric, alphanumeric, and group data, and explains how to declare and use variables. It also covers the different types of operations that can be performed on variables, such as arithmetic, comparison, and logical operations. Finally, it covers the different ways to manipulate data, such as sorting, searching, and merging.

Lessons

- Introduction to Data Types and Variables in COBOL
- Declaring Variables in COBOL
- Numeric Data Types in COBOL
- Character Data Types in COBOL
- Working with Variables in COBOL
- Manipulating Variables in COBOL
- Using Arrays and Tables in COBOL
- Working with Pointers in COBOL
- Debugging Data Types and Variables in COBOL
- Best Practices for Working with Data Types and Variables in COBOL

After completing this module, students will be able to:

- Understand the different data types available in COBOL and how to declare and use variables.
- Utilize the various arithmetic and logical operations available in COBOL.
- Create and manipulate strings and arrays.
- Use the various control structures available in COBOL to create complex programs.

Module 3: Control Structures

Module 3: Control Structures in COBOL is designed to teach students the fundamentals of control structures in the COBOL programming language. This module covers topics such as IF-ELSE, PERFORM, EVALUATE, and GO TO statements, as well as how to use them to create efficient and effective programs. Students will also learn how to debug and troubleshoot their programs.

Lessons

- Introduction to Control Structures
- IF-ELSE Statements
- EVALUATE Statements
- PERFORM Statements
- GO TO Statements
- Nested Control Structures
- Debugging Control Structures
- Working with Tables
- Working with Arrays
- Working with Strings

After completing this module, students will be able to:

- Understand the syntax and usage of the various control structures in COBOL, such as IF-ELSE, PERFORM, and GO TO.
- Be able to write programs using the various control structures in COBOL.
- Be able to debug and troubleshoot programs using the various control structures in COBOL.
- Be able to optimize programs using the various control structures in COBOL.

Module 4: File Processing

Module 4 of the COBOL course focuses on file processing. It covers topics such as file organization, file access methods, and the use of the COBOL language to manipulate files. It also covers the use of the SORT and MERGE statements to sort and merge files. Finally, it covers the use of the COBOL language to read and write files.

Lessons

- Introduction to File Processing
- Working with Sequential Files
- Working with Relative Files
- Working with Indexed Files
- Working with VSAM Files
- Working with Multiple Files
- Working with File Status Codes
- Working with File Control Statements
- Working with File Handling Verbs
- Working with File Handling Functions

After completing this module, students will be able to:

- Understand the fundamentals of file processing in COBOL
- Create and manipulate files using COBOL
- Utilize the various file processing verbs to read, write, and update data
- Debug and troubleshoot file processing programs in COBOL

Module 5: Subprograms

Module 5 of the COBOL course focuses on subprograms, which are used to break down complex tasks into smaller, more manageable pieces. It covers topics such as how to create and call subprograms, how to pass data between them, and how to use the LINKAGE SECTION to share data between programs. It also covers debugging techniques and best practices for writing subprograms.

Lessons

- Overview of Subprograms
- Defining Subprograms
- Invoking Subprograms
- Passing Parameters to Subprograms
- Local and Global Data Storage
- Debugging Subprograms
- Subprogram Performance Considerations
- Subprograms and Exception Handling
- Subprograms and Security
- Subprograms and Database Access

After completing this module, students will be able to:

- Understand the purpose and syntax of subprograms in COBOL
- Create and call subprograms in COBOL
- Utilize the PERFORM statement to execute subprograms
- Debug and troubleshoot subprograms in COBOL

Module 6: Debugging and Troubleshooting

Module 6 of the COBOL course focuses on debugging and troubleshooting techniques. Students will learn how to identify and resolve errors in their COBOL programs, as well as how to use debugging tools to identify and fix problems. The module also covers techniques for debugging distributed applications and how to use the COBOL debugger.

Lessons

- Overview of Debugging and Troubleshooting in COBOL
- Debugging Techniques in COBOL
- Debugging Tools in COBOL
- Debugging Strategies in COBOL
- Troubleshooting Common COBOL Errors
- Debugging and Troubleshooting Performance Issues in COBOL
- Debugging and Troubleshooting Memory Leaks in COBOL
- Debugging and Troubleshooting Data Integrity Issues in COBOL
- Debugging and Troubleshooting Network Issues in COBOL
- Debugging and Troubleshooting Security Issues in COBOL

After completing this module, students will be able to:

- Identify and resolve errors in COBOL programs.
- Utilize debugging tools to identify and fix errors in COBOL programs.
- Understand the debugging process and how to use it to identify and fix errors.
- Develop strategies for debugging and troubleshooting COBOL programs.

Module 7: Advanced COBOL Features

Module 7: Advanced COBOL Features is a comprehensive course designed to provide students with an in-depth understanding of the more complex features of the COBOL programming language. Topics covered include advanced data structures, debugging techniques, and optimization strategies. Students will also learn how to use the latest COBOL features to create efficient and reliable programs.

Lessons

- Introduction to Advanced COBOL Features
- Working with Data Tables
- Working with Subscripts and Indexes
- Working with Arrays

- Working with Pointers
- Working with Structured Programming
- Working with Dynamic Memory Allocation
- Working with File Handling
- Working with Exception Handling
- Working with Debugging and Tracing

After completing this module, students will be able to:

- Understand the syntax and usage of the various COBOL verbs and clauses.
- Develop programs using advanced COBOL features such as table processing, dynamic calls, and debugging techniques.
- Utilize the various COBOL debugging tools to identify and resolve errors in programs.
- Create and maintain complex COBOL programs using advanced features such as data division, file handling, and control structures.

Module 8: Database Access

Module 8 of the COBOL course covers the fundamentals of database access. It covers topics such as database design, SQL commands, and how to access and manipulate data stored in a database. It also covers how to use the COBOL language to interact with a database.

Lessons

- Introduction to Database Access in COBOL
- Connecting to a Database from COBOL
- Working with Database Tables in COBOL
- Retrieving Data from a Database in COBOL
- Updating Data in a Database from COBOL
- Deleting Data from a Database in COBOL
- Working with Database Views in COBOL
- Working with Database Stored Procedures in COBOL
- Working with Database Triggers in COBOL
- Working with Database Cursors in COBOL
- Working with Database Transactions in COBOL
- Working with Database Security in COBOL
- Troubleshooting Database Access in COBOL

After completing this module, students will be able to:

- Understand the fundamentals of database access in COBOL
- Create and execute SQL statements in COBOL
- Utilize the COBOL database access features to manipulate data
- Develop programs to access and update data in a database

Module 9: Working with XML

Module 9 of the COBOL course focuses on working with XML. It covers topics such as XML syntax, creating and manipulating XML documents, and using XML in COBOL programs. It also covers techniques for validating XML documents and using XML in web services.

Lessons

- Introduction to XML
- XML Syntax and Structure
- Parsing XML with COBOL
- Generating XML with COBOL
- Working with XML Namespaces
- Validating XML with COBOL
- Transforming XML with XSLT
- Working with XML Schemas
- XML Security
- XML Performance Tuning

After completing this module, students will be able to:

- Understand the structure of XML documents and how to create them.
- Use the XML GENERATE and XML PARSE statements to read and write XML documents.
- Use the XML NAMESPACE statement to define namespaces and prefixes.
- Use the XML INCLUDE statement to include external XML documents.

Module 10: Performance Tuning

Module 10 of the COBOL course focuses on performance tuning. It covers topics such as analyzing and optimizing COBOL programs, using performance tuning tools, and understanding the impact of hardware and software on program performance. It also covers techniques for improving the performance of COBOL programs, such as using indexes, optimizing data access, and using efficient coding techniques.

Lessons

- Understanding the Performance Tuning Process
- Analyzing Performance Bottlenecks
- Optimizing COBOL Code
- Using Compiler Options to Improve Performance
- Using Indexes to Improve Performance
- Using Database Tuning to Improve Performance
- Using System Tuning to Improve Performance
- Troubleshooting Performance Issues
- Monitoring Performance
- Best Practices for Performance Tuning

After completing this module, students will be able to:

- Understand the importance of performance tuning and its impact on the overall system performance.
- Identify and analyze performance bottlenecks in COBOL programs.
- Utilize various techniques to optimize the performance of COBOL programs.
- Implement best practices for performance tuning of COBOL programs.